

Summer Research 2016/17 Project List



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

FACULTY OF ARTS & SOCIAL SCIENCES:	PROJECTS 1 - 6
Linguistics	
Media Studies	
Philosophy	
Psychology	
Population Studies	
FACULTY OF COMPUTING & MATHEMATICAL SCIENCES:	PROJECTS 7 - 16
Mathematics	
Computer Science	
Statistics	
Cyber Security	
Web Programming	
FACULTY OF EDUCATION:	PROJECTS 17 - 28
Te Hononga: Curriculum & Pedagogy	
Te Oranga: School of Human Development and Movement Studies	
Te Whiringa: Educational Leadership & Policy	
Wulf Malcolm Institute of Educational Research	
FACULTY OF SCIENCE & ENGINEERING:	PROJECTS 29 - 57
School of Engineering	
School of Science	
Environmental Research Institute	
SCHOOL OF GRADUATE RESEARCH:	PROJECT 58
Higher Education	

SCHOOL OF MAORI & PACIFIC DEVELOPMENT:	PROJECTS 59 - 60
New Zealand/Māori History	
Te Reo Māori / Health	
WAIKATO MANAGEMENT SCHOOL:	PROJECTS 61 - 65
Finance	
International Trade / Public Economics	
Economics / Population Studies	
Māori wellbeing	

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	1
Supervisor/s:	Andreea Calude & Hemi Whaanga, Steven Miller		
Project Title:	The Reo in Our Lives: Using Māori borrowings in New Zealand newspapers		
Faculty:	FASS	Field:	Linguistics, Māori, Statistics

EXPECTED OUTCOMES:

We expect to create a small body of newspaper data (a corpus) containing coded Māori borrowings (in the form of an Excel spreadsheet), coded for a number of linguistic (loans, and their use) and non-linguistic (authors, publications, date) properties. This would then be used as input to a statistical Network Analysis model that would assign probabilities of use of various borrowings in connection to other borrowings. The data would serve as a starting point in creating a number of small visual semantic maps detailing 'hub' loans, and 'peripheral' loans, in various newspapers, and at various times during the year (perhaps). This project is envisaged as a pilot for a larger project (that could be pursued in future together with the student as a Masters project), and the findings uncovered could form the basis for a future peer-reviewed journal article and conference presentation. The student working with us will gain both generic and specific research skills. Specifically, they will benefit from being involved in the selection of newspaper materials for the compilation of a modest linguistic corpus and in the process of coding language data. They will also acquire knowledge of certain computer packages used in language research (such as AntConc) and in quantitative research more generally (R) all of which are open source (so the student will be able to use them anytime in future for their other projects/courses). The project will expose the student to a truly cross-disciplinary research environment, thereby offering the chance of experiencing an actual research project from start to finish (depending on how the coding goes). They will be involved at all stages of the research process and therefore obtain a hands-on introduction to scientific research.

STUDENT TASKS:

1. to find and archive newspaper articles (with our assistance) from the University of Waikato online database relating to the topics of Maori Language Week and Matariki (we will guide the student here)
2. to set up a corpus using appropriate Markup Language and learn how to load it in the open source corpus linguistics software AntConc and how to run concordance searches, and begin to search and identify all Māori loans which occur in the corpus
3. to track the use of all Māori borrowings identified in the newspaper articles found above, in an Excel spreadsheet, coding for various factors (the newspaper, the date, the author, the topic of the article, and possibly one or two other factors to be discussed), learn how to use formulae in Excel and to manipulate text data
4. to meet with us regularly to discuss coding of the data and as this coding evolves, depending on findings, adapt to it
5. to develop (in conjunction with us) interesting visual ways of representing the data coded following the coding process, most likely by using the statistics open source package R
6. to summarise the data and research design, and prepare data for statistical analysis (under our guidance)

REQUIRED SKILLS:

1. good language skills, and ability to do online library searches of New Zealand newspapers
2. good computer literacy skills (ability to use Excel), and willingness to learn how to use other software packages, AntConC (corpus analysis) and R (statistics)
3. ability to pay attention to detail and maintain good accuracy and focus in coding data
4. good communication skills: this project will involve cross-disciplinary collaboration between linguistics and statistics researchers, and we will all meet together to discuss coding as the project evolves
5. willingness to be creative and have fun with data visualisation tools
6. Bonus: knowledge in / interest in Te Reo Māori

PROJECT ABSTRACT:

New Zealand English (NZE) constitutes one of the most remote varieties of English spoken in the world. Throughout its short history, it forged a new voice, divergent from its British origins, distinct from its Australian cousin, and shaped by its ethnic diversity. Significantly, Māori indigenous culture constitutes an integral part of the cultural and linguistic roots of New Zealand. The flow of words of Māori origin into New Zealand English is one of the most salient features of this young dialect, and one that linguists and non-linguists have noticed right from the very beginning of the study and documentation of NZE. As a result of the preoccupation with the study of Māori borrowings in NZE, a steady body of knowledge has taken shape. We know, for example, that we are using more Māori borrowings today than we ever did before, with 6 in every 1,000 being of Māori origin. We also know that the borrowing process took place in a number of 'waves', and that each wave privileged different types of lexical items.

This project seeks to increase our understanding of Māori borrowings in NZE by documenting and modelling (statistically) the use of such borrowings in New Zealand newspapers. The language of the media constitutes a barometer for societal norms (including linguistic norms), and we want to obtain a detailed snapshot of how Māori borrowings are used in various newspapers, at various times of the year, and in relation to different topics. We think that certain borrowings are likely to attract the use of other borrowings, for example, we hypothesize that an article that uses a word like 'marae' has a reasonably high chance of also containing the word 'Māori' (itself a borrowing) and perhaps a word like 'iwi'.

Data from newspapers together with statistical tools (like Network Analysis) could help illuminate hub borrowings (high-attractor words), and help us attach probabilities to borrowing use (given the use of the borrowed word X, what chances are we to come across word Y?), and also to form clusters of borrowings which co-occur (go together).

If time permits, we would also like to explore the possibility of drawing interesting and visually appealing semantic maps of the use of the borrowings analysed.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	2
Supervisor/s:	Isabelle Delmotte		
Project Title:	Locating nature in the soundscapes of popular wildlife and natural history documentaries		
Faculty:	FASS	Field:	Media Studies

EXPECTED OUTCOMES:

The outcomes of the data collection will consist of qualitative and quantitative sets of information to use in journal publications, and to also use in the instigation of potential collaborations with various stakeholders. The data obtained will concurrently provide tangible material for future innovative creative outputs using various kinds of data visualisation and aiming to reach different audiences, from specialists to general public.

STUDENT TASKS:

1. In consultation with supervisor contribute to the devising of search terms
2. In consultation with supervisor contribute to the setting of research criteria and targets
3. Watch a considerable amount of nature documentaries extracted from existing online Australasian databases
4. produce descriptive qualitative data based on specific listening criteria
5. produce descriptive qualitative data based on specific criteria relative to audio content
6. produce quantitative data based on historical documentary production criteria
7. contribute to the production of a typology of the audio data examined

REQUIRED SKILLS:

1. Ability to assess and clearly describe sounds
2. Ability to recognise and document narrative devices used in documentary productions
3. Ability to do detailed online research in different kind of databases
4. Ability to generate qualitative and quantitative data
5. An understanding of media aesthetic and documentary genre
6. An understanding of audio-visual production and post-production

PROJECT ABSTRACT:

The terms 'wildlife', 'natural history', and 'nature' are often interchangeably used to describe a type of documentary. The resulting 'nature genre' is commercially successful but the impact of its various audio components is academically under-examined. My enquiry engages with affective, commercial and technical processes involved in creating sound for these televised documentaries.

This research started at the end of 2015. Since then it has become apparent that historical and perceptual frameworks should be further defined. Over the past 50 years media technologies have contributed to a remodeling of both our lived and mediated soundscapes.

The project associated to the Summer Scholarship examines analogue and digital nature documentary productions and professional audio practices in relation to natural soundscapes perceived by television viewers. Soundscapes of nature documentaries reveal sonic elements integral to the relationships between human and their environments: geophony, biophony, and anthrophony. Before the 1970s, 20 hours of sound recording in natural settings would typically produce one hour of sound full of animal life. It can now take more than 1000 hours to obtain one hour of sonic data devoid of man-made sounds. Currently an hour of nature documentary may contain as little as two minutes of sounds from natural soundscapes.

Professional media practices endeavour to reduce anthrophonic noise although one can argue that the concept of nature within the documentary genre should include all sonic elements. Documentary makers have been preoccupied with ways to portray 'the real'. However, no documentary seems devoid of subjectivity; classifications within the genre are often based on different audio-visual approaches eliciting knowledge and emotions. Understandably, audible assets composing soundtracks for nature documentaries (music, voice, effects and recorded sounds) are remarkably telling of the level of subjectivity exercised. Popular nature documentaries often morph into melodramas with environmental soundtracks submerged by voice narration and music: 'truthful' sonic renderings of wildlife and associated soundscapes can be compromised.

The devising of nature documentary soundtracks reflects entertainment values and scientific content; all production steps and creative decisions impact on expected audiences. The project examines qualitatively and quantitatively the evolution of an increase of music and a decrease of biophonic and geophonic data in televised nature programmes. As well as surveying the presence of geophony and biophony in these documentaries, the data collection will examine whether musical content has increased to counter a rise of locative anthrophony and a decrease of biophony. Concurrently the project will explore the influence of digital audio technology on the affective qualities of nature documentaries. Rigorous listening to audio-visual programmes will provide alternative views on the evolution of soundtracks in nature documentaries. In this context it is paramount to obtain data by assessing numerous existing nature programs using the human ear rather than mechanically analysing their sonic frequencies. The nature documentary genre fuels a specialised world-renowned industry in New Zealand and Australia.

The data collection will focus on nature documentaries produced in these countries after 1965. Its outcomes will provide for a better positioning of the research, a larger variety of outputs, and increased industry connections.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	3
Supervisor/s:	Joe Ulatowski		
Project Title:	The Fragmentation of Truth		
Faculty:	FASS	Field:	Philosophy Cognitive Science

EXPECTED OUTCOMES:

The ultimate aim of this research project is the publication of a book monograph, tentatively entitled: "The Fragmentation of Truth." While I don't suspect that the Summer 2016-2017 will yield that research output, the work that the successful candidate and I complete will contribute to the completion of that project. The work performed over the summer will likely yield a journal article for publication, as well as information to be contained in future grant applications.

STUDENT TASKS:

1. Assist the supervisor by collecting and reviewing scholarly work in philosophy;
2. Learn how to do empirical and a priori academic research in philosophy and the cognitive sciences;
3. Correspond with internal and external scholars in Philosophy and Cognitive Science about the project; and
4. Analyse the feasibility of an Experimental Philosophy Research Lab (time permitting).

REQUIRED SKILLS:

1. Preferred applicant has completed at least one 300-level paper in Philosophy and one 100-level paper in Psychology;
2. Work effectively with others as a part of a team to achieve established outcomes;
3. Communicate clearly and professionally;
4. Ability to retrieve bibliographic information through the University library quickly and efficiently; and
5. Willingness to acquire new knowledge and beneficial skills.

PROJECT ABSTRACT:

Truth is a core virtue of all intellectual activity, a precondition for understanding, and the central aim of science, the arts, and--perhaps above all--philosophy; despite this, it is among the least well understood. This is particularly the case when we consider the many and varied ways in which people outside academic circles employ the concept of truth.

This project intends to empirically investigate whether traditional philosophical views about truth and the ordinary person's conception of truth align with one another.

Preliminary findings undertaken by the supervisor have revealed that the two aren't always compatible, revealing some intriguing ways in which people's intuitive responses to questions about truth depend upon individual differences, background contextual features, or implicit cognitive biases.

While the nature of truth debate in the philosophy of language has rarely called upon experimental investigations to support its theories, the rise of a movement known as "experimental philosophy" appears to be changing the way we look at engaging in such traditional philosophic debates. Experimental philosophy calls upon the use of empirical methods more commonly employed in the empirical sciences, such as psychology and sociology, to help support or dismiss assumptions that operate in philosophical theorising. The time is ripe to infuse empirical data into the nature of truth debate.

The supervisor has published in the area and works with prominent members of the philosophic community outside New Zealand. This project entails that the successful candidate will not only learn about the theoretic foundations of the nature of truth debate but also come to appreciate engaging in academic research and the professional side of philosophy. Knowledge of and acquaintance with the history and practice of philosophy is not presupposed; curiosity is.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	4
Supervisor/s:	Sabine Seehagen & Carrie Barber		
Project Title:	Mapping the village: services and resources for parents of infants in New Zealand		
Faculty:	FASS	Field:	Psychology

EXPECTED OUTCOMES:

The outcome of this project will be threefold. First, a user-friendly website will be available to parents which provides a comprehensive overview of resources available to young parents. This will be a valuable tool for the general public and health professionals. It will also be available to participants of a larger scale intervention study which assesses the effectiveness of a mobile app for pregnant women, aimed at reducing stress and promoting well-being. Second, the project will contribute to the development of the aforementioned intervention project by supporting the further development of the app. Third, the project will support a newly established research programme at the School of Psychology, the Waikato Early Development Studies (WEDS), aimed at exploring infant and child development. The project on sleep-dependent emotional memory in infants in which the research student will get involved has received SIF funding for 2016. The research student's contribution will help to continue data collection after completion of the funded pilot testing period, and to code and analyse the data from this project.

STUDENT TASKS:

1. Search internet for parent information and programmes
2. Interview parents and parent support professionals about resources for families
3. Organize findings into accessible categories
4. Design and produce a website useable by parents and professionals
5. Contribute to testing and development of a mobile app for pregnant women
6. Assist in ongoing studies on infant learning and memory

REQUIRED SKILLS:

1. Excellent basic computer skills for searching and managing data
2. Flexible and creative thinking to identify a wide variety of types of resources for parents
3. Organizational skills to document and present those resources in a usable way
4. Interviewing skills for both individual and focus groups
5. Web page design and construction (or willing to learn)

PROJECT ABSTRACT:

Becoming a parent is a major life transition that affects us in a wide variety of domains, from health to financial to social and recreational. Fortunately, most families don't have to do this alone - they live in the proverbial 'village' that helps to raise the child. New Zealand communities have a rich array of resources' public and private, formal and informal for new parents. Some are well known, like Plunket and ParentCentre, while others are less well known and may be difficult for parents to access, particularly those with fewer connections in the community.

This research is part of a wider project on stress and coping in the transition to parenthood. The goal for this summer student research scholarship is to develop a website of resources for parents, particularly focused on resources that foster strong networks of social support and services that might be of help to families who are struggling with anxiety, depression, or other mental illness. This website will be a resource in itself to families and professionals, but also will be linked to a mobile app being developed for pregnant women.

The app is expected to be in testing and refinement phases over the summer, so the research student may also be involved in helping to guide participants to test out the app, and running focus groups on the responses and needs of pregnant women to the app and to the website. In addition to being involved with the website and app development, the research student will also get the opportunity to engage with ongoing studies on infant learning and memory. For example, in a study on the role of sleep for early memory, the student may participate in assessments of infants, and help with coding infant behaviours from video.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #: 5
Supervisor/s:	Polly Atatoa Carr & Nina Scott	
Project Title:	How does comprehensive health screening within the inpatient setting help community child health outcomes	
Faculty:	FASS	Field: Population Health

EXPECTED OUTCOMES:

1. An electronic data base of the Harti Hauora comprehensive screening tool delivery for Waikato Hospital inpatients in 2016
2. An audit report of a specific screening pathway, with assessment of: Screening completion (by demographic characteristics)

STUDENT TASKS:

1. Access the comprehensive screening tool within patient files at the Clinical Records department of Waikato Hospital
2. Scan the screening tool files (resource available)
3. Enter screening data into an Excel database (already established)
4. Determine basic descriptive statistics from the Excel database, with support from supervisors
5. Determine, in collaboration with supervisors and Governance Group, appropriate research questions to audit components of the screening tool path
6. Undertake quantitative audit
7. Develop a draft report of findings

REQUIRED SKILLS:

1. Excel experience
2. Word experience, report/essay writing
3. Data entry
4. Basic statistical (descriptive) analysis - will be supported/developed
5. Initiative
6. Ethical research understanding - particularly privacy and confidentiality

PROJECT ABSTRACT:

Since mid 2015, the Waikato DHB has delivered a comprehensive opportunistic screening tool, Harti Hauora, to all inpatients within Child Health Services at Waikato Hospital. This tool has assessed holistic health care for patients and their whanau, particularly considering need outside of the presenting health issue. Examples of such opportunistic care that are addressed in the screening tool include: access to breastfeeding, enrolment (and utility of) Well Child Tamariki Ora Health and Primary health services, oral health assessment, second hand cigarette exposure, and housing and health. Where possible, established methodology has been utilised to collect information about whanau health, and appropriate referral criteria have been established where gaps in service delivery or health care need has been identified. Data from each inpatient (and their whanau) has been collected on a standardised paper-based form within the patient notes, and consent has been gained for whanau to be contacted following delivery of the screening tool.

An audit in late 2015 of the delivery of the screening tool has determined that having such a standardised methodology significantly increases the likelihood that preventative care is investigated during a hospital stay. However, without research resource it has not been possible to establish an appropriate electronic database of the responses to the screening tool, and to confirm the delivery of each referral path. Further, outcomes for the children (and their whanau) are not yet assessed.

In 2016 to date, over 1000 patients have received the comprehensive screening tool. In order to evaluate the effectiveness of the screening pathway, from assessment to referral to management, this project will establish an electronic database of patient data from inpatient admissions in 2016 and follow the referral path for selected health areas. It will be determined whether children for whom a particular health need was identified utilising the Harti Hauora approach (such as a need for a Well Child Tamariki Ora assessment, or for enrolment in primary health care) were able to meet that need. Evaluation of the effectiveness, acceptability and sustainability for the whanau themselves will also be explored. Results of such research would assist with the modification of the existing Harti Hauora screening tool (specific aspects of the tool as well as their referral pathways) as well as provide evidence for an improved delivery of similar screening processes for services within Waikato DHB outside of inpatient Child Health.

This would be of high utility for Harti Hauora Governance and Operational requirements at the Waikato DHB as well as to ensure there are improved health equity and health outcomes for high need populations within the Waikato region. Supervised by AProf Polly Atatoa Carr as well as clinicians from Waikato Hospital, this project is an opportunity for a student to build research skills and capability in health services delivery, population health and equity. Further research opportunities are likely to arise.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	6
Supervisor/s:	Matthew Roskrug & Michael Cameron		
Project Title:	Estimating international population movements by ethnic identity		
Faculty:	FASS	Field:	Population studies, Statistics

EXPECTED OUTCOMES:

The research project will significantly increase the successful applicant's applied research capability, especially in data manipulation and analysis, working with external stakeholders, and report writing. Statistics New Zealand has agreed to co-fund the Summer Research Scholarship. Statistics New Zealand will benefit from one or more sets of experimental estimates of external migration by ethnic identity, and enhanced understanding of the strengths and weaknesses of IDI data for estimating external migration. The University will benefit from promoting a closer research relationship between the National Institute of Demographic and Economic Analysis (NIDEA) and Statistics New Zealand. This project builds on work conducted by students during the 2015/16 Summer Research Scholarships, and continues a fruitful research collaboration between the University of Waikato and Statistics New Zealand. It will also encourage use of the IDI lab at Waikato.

STUDENT TASKS:

1. Familiarise themselves with the IDI, including gaining access to the data and undergoing confidentiality training.
2. Use the IDI to link ethnic identity data from one or more administrative data sources (health or education data) to data on permanent and long term arrivals and departures.
3. Produce estimates of the number of arrivals and departures, by ethnic identity.
4. Validate the estimates produced by comparing the inferred affiliations from the administrative data sources with affiliations that could instead be attached to the data using the 2013 Census.
5. Write a report describing the methods and results, and commenting on the plausibility or otherwise of the estimates, pointing to particular ethnicities, age groups, or other subsets where the methods appear to be performing badly or well.
6. Prepare a poster summarising the research to be displayed at the Summer Research Scholarship end function.

REQUIRED SKILLS:

1. Statistical analysis skills (e.g. STAT221, ECON204), including familiarity with a statistical package, eg R, Stata, or SAS.

PROJECT ABSTRACT:

Statistics New Zealand's estimates and projections of ethnic populations at both the national and the subnational level require estimates of external migration by ethnic identity. Arrival and departure cards currently provide good data on migration flows, but provide no direct data on the ethnic identity of travellers. This may limit the accuracy of estimates and projections of ethnic populations. There is therefore great interest in investigating ways of 'attaching' ethnic identity to arrival and departure data.

The Integrated Data Infrastructure (IDI) is a promising source of data on external migration. The IDI is a collection of linked administrative datasets, housed at Statistics New Zealand, and is increasingly being used for research with substantial policy and practical applications. The University of Waikato has access to the IDI via a datalab. Arrivals and departures data are included within the IDI, as are Census and other administrative data that include ethnic identity data, meaning that it is possible to infer ethnicity for travellers.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	68
Supervisor/s:	Matthew Roskrug & Grant Christey (WDHB)		
Project Title:	Cows with Guns: The burden of large-animal related physical trauma		
Faculty:	NIDEA	Field:	Health & Trauma

EXPECTED OUTCOMES:

- The research project will significantly increase the successful applicant's applied research capability, offering an opportunity for the student to develop their knowledge in the health assessment space, in quantitative methods and report writing.
- The project will facilitate research linkages between the Waikato District Health Board and the University of Waikato, which will lead to future research collaborations.
- The project should also form the basis of a future journal article and conference presentations, co-authored by the student and supervisors.

STUDENT TASKS:

1. Undertake a literature review of physical trauma caused by large animals, with a focus on injuries occurring on dairy, beef and sheep industries.
2. In partnership with the supervisors, decide on what measures and metrics to will be used.
3. Using Midlands Regional Trauma System data and provided IT resources, construct the measures or prepare data where specialist skills are required.
4. Write a report incorporating the literature review, methods and results.
5. Prepare a poster summarising the research to be displayed at the Summer Research Scholarship end function and Fieldays 2017.

REQUIRED SKILLS:

1. Good written communication skills
2. Willingness to problem solve and work independently
3. Research methods skills
4. Statistical analysis skills
5. Strong Familiarity with Excel

PROJECT ABSTRACT:

New Zealand has a vibrant animal agriculture industry, with dairy and meat product exports forming a vital part of our economy. However, rural life is not without its dangers, and the close proximity between our rural population and large animals means that incidents resulting in physical trauma requiring hospitalization will occur.

Using unique data obtained through the Midland Trauma System, this study aims to examine this gap by investigating the burden of trauma caused by large grazing animals (excluding equine related injury) in the Midlands region. To do this, the successful student will need to develop a solid grounding in the expansive existing literature on injuries caused by large animals. Students will then be provided with the analysis tools and data to analyse the mechanisms and patterns of human injuries caused by large grazing animals and offer insights into the health and resource burden of injuries resulting from incidences including large animals.

Data will be drawn from the Midland Trauma Registry, managed by the Midland Trauma System Hub Team at the Waikato District Health Board. This registry contains data on all patients in the Midland region (Bay of Plenty, Lakes, Tairāwhiti, Taranaki and Waikato District Health Boards) from point of injury through to point of definitive care, and links to cost and resource related data.

PLEASE NOTE THAT THIS PROJECT WILL BE BASED AT THE WAIKATO DISTRICT HEALTHBOARD AT THE WAIKATO HOSPITAL

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #: 69
Supervisor/s:	Matthew Roskrige & Grant Christey (WDHB)	
Project Title:	The benefits of transport planning from point of injury for trauma patients	
Faculty:	NIDEA	Field: Health

EXPECTED OUTCOMES:

- The project will contribute to informing policy advice around pre-hospital transport of patients in the Midlands region.
- The research project will significantly increase the successful applicant's applied research capability, offering an opportunity for the student to develop their knowledge in the health assessment space, in quantitative methods and report writing.
- The project will facilitate research linkages between the Waikato District Health Board and the University of Waikato, which will lead to future research collaborations.
- The project should also form the basis of a future journal article and conference presentations, co-authored by the student and supervisors.

STUDENT TASKS:

1. Undertake conduct a literature review which includes pre-hospital transfer policy in New Zealand and
2. In partnership with the supervisors, develop a model for estimating travel times and distances from point of injury to final medical facility
3. Using Midlands Trauma System data, test the developed model to estimate what impact implementation of a transport policy would have had on the travel times and resource use of patients using retrospective data.
4. Write a report incorporating the literature review, methods and results.
5. Prepare a poster summarising the research to be displayed at the Summer Research Scholarship end function

REQUIRED SKILLS:

- Good written communication
- Research methods skills
- Willingness to problem-solve and innovate
- Familiarity with Excel.

Desirable: Health sector experience

PROJECT ABSTRACT:

Injured patients require focused and efficient care throughout their patient journey, from point of injury through to return to optimal function. Often the journey is complex, requiring many interacting agencies, resources and planning to provide the optimal care and make the best use of health resources.

Pre-hospital care and transportation is a key component of care for trauma patients. Best practice pre-hospital transportation should ensure where possible that patients are transported efficiently to the best care facility for their needs, without unnecessary delays or inter-hospital assessments. By developing strategies to ensure that trauma patients are taken to the right place in the most efficient means possible, our health system is able to provide better health outcomes while lowering unnecessary health resource use.

This project will directly contribute to improving our understanding of pre-hospital transportation of patients in the Midlands health region and add to the international discourse. To achieve this, the successful applicant will be required to work closely with supervisors both at Waikato Hospital and the University of Waikato to develop a detailed understanding of the existing literature on pre-hospital transportation of patients based on international and domestic literature and policy. The student will then be required to model what the implications of a strict patient transportation policy would have been using retrospective analysis of existing patient data.

Data will be drawn from the Midland Trauma Registry, managed by the Midland Trauma System Hub Team at the Waikato District Health Board. This registry contains data on all patients in the Midland Region (Bay of Plenty, Lakes, Tairāwhiti, Taranaki and Waikato District Health Boards) from point of injury through to point of definitive care.

PLEASE NOTE THAT THIS PROJECT WILL BE BASED AT THE WAIKATO DISTRICT HEALTHBOARD AT THE WAIKATO HOSPITAL

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #: 7
Supervisor/s:	Nicholas Cavenagh	
Project Title:	Defining set sizes in Latin squares	
Faculty:	FCMS	Field: Discrete Mathematics

EXPECTED OUTCOMES:

The student will:

- write a report on their research.
- have a taste of postgraduate research, including working on an unsolved problem.

STUDENT TASKS:

1. The student will learn about current results and techniques on this problem.
2. The student will undertake computer searches for defining sets (if the student has programming skills).
3. The student will attempt to improve on existing results on defining set sizes, focusing on the smallest unsolved cases.

REQUIRED SKILLS:

1. Mathematics major
2. Programming skills may be helpful but are not necessary

PROJECT ABSTRACT:

Analogously to a Sudoku puzzle, one can specify partial information in a Latin square (i.e. a defining set) so that only a unique completion is possible. The size of the defining set is the number of filled cells. The exact size of the smallest possible defining set is not known in general.

The student will work on this project, either for specific values using integer programming or looking for theoretical results.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	8
Supervisor/s:	Michael Mayo & Mark Apperley		
Project Title:	Electric Vehicle Route Finding: Least Time vs. Least Energy		
Faculty:	FCMS	Field:	Computer Science

EXPECTED OUTCOMES:

A software platform that can be used for testing new route-finding algorithms for EVs that optimally trade off time and energy. This will be used by Computer Science honours project students and possibly other postgraduate students in 2017 for their research, which will lead to publications.

STUDENT TASKS:

1. Locate and evaluate suitable street map and altitude data for experimentation
2. Construct a search graph from the data
3. Build an API to read the search graph
4. Build a GUI to visualise portions of the graph as well as routes
5. Implement demonstration route finding algorithms

REQUIRED SKILLS:

1. Programming ability (Java or Clojure required)
2. Knowledge of common search algorithms (Dijkstra, A*)

PROJECT ABSTRACT:

Electric Vehicles (EVs) pose interesting challenges for route-finding algorithms. The least-time route between two locations on a road graph can normally be found using Dijkstra's Algorithm, which takes polynomial time.

If energy (not time) is the crucial factor to optimise, then Dijkstra's Algorithm cannot be applied because the edge weights of a road graph may be negative (thanks to the ability of EVs to recharge their battery on downhill segments of road). A-Star is therefore the best choice for least-energy route-finding. However, in practice the least-energy route may be far from optimal in terms of travel time (e.g. the least-energy route may take twice the amount of time that the least-time route would take), and this is very inconvenient. New algorithms are therefore needed for finding alternative routes that correctly trade-off time and energy when route finding. This turns out to be an instance of the constrained shortest path problem, which is NP-Hard.

This summer research project will work towards building a platform for experimenting with EV route-finding algorithms. The aims of the project will be to:

- (i) locate, evaluate and select feasible sources of street map and altitude data for New Zealand,
- (ii) implement code to parse this data into a graph and build an API for straightforwardly accessing the graph
- (iii) implement a GUI for visualising routes, and
- (iv) implement demonstration route-finding algorithms, starting with Dijkstra's Algorithm for the least-time route finding and (time permitting) the A-Star approach for least-energy route finding. The platform will enable future research/student projects concerning EV route finding algorithms.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
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ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	9
Supervisor/s:	Shaoqun Wu & Ian Witten		
Project Title:	Discovering language structure in PhD abstracts		
Faculty:	FCMS	Field:	Computer Science

EXPECTED OUTCOMES:

This is an exploratory investigation that may lead to future research grant applications, and to a significant enhancement to the FLAX language learning system, which is already an internationally recognised University of Waikato project. The student will learn about corpus-based language analysis, and natural language processing (such as part-of-speech tagging).

STUDENT TASKS:

1. Use FLAX collections of PhD abstracts to examine text for salient linguistic patterns
2. Correlate these patterns with others found from FLAX's collocation databases
3. Devise algorithms to locate potentially useful patterns automatically
4. Store the extracted patterns in a NoSQL database
5. Design an interface to help students create text based on these patterns
6. Create the interface
7. Deploy it in a web environment

REQUIRED SKILLS:

1. Java and Javascript programming
2. Some experience of popular Javascript libraries (e.g. jQuery, Bootstrap)
3. Database technologies
4. General familiarity with Web techniques and protocols

PROJECT ABSTRACT:

This project will develop algorithms to identify and extract language patterns from academic text, and develop an interface that presents the patterns to students and teachers in the form of writing templates. The text base consists of 30,000 PhD abstracts (6M words) made available by the British Library. Writing templates from patterns extracted from them, and from and other language resources like FLAX's Wikipedia collocation database. The extracted data will be stored and indexed in an NoSQL database (e.g. MongoDB) for fast response time and scalability. The interactive interface will present the patterns and writing templates to language teachers and learners using modern web technologies, and deploy it on FLAX (flax.nzdl.org).

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
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Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	10
Supervisor/s:	Judy Bowen & Annika Hinze		
Project Title:	Developing a Web Application to Test Perception Differences		
Faculty:	FCMS	Field:	Web programming and user testing

EXPECTED OUTCOMES:

The completion of the web application. An initial pilot study involving forestry workers and analysis of the study data.

STUDENT TASKS:

1. Extend the existing web application
2. Add reporting functionality to the web application
3. Prepare and conduct a user-study
4. Analyse the results of the user study

REQUIRED SKILLS:

1. Basic web development skills (HTML, CSS, JavaScript, PHP, MySQL)

PROJECT ABSTRACT:

As part of our work with the forestry industry we are looking at producing technological solutions to help measure fatigue and impairment and understand contributors to accidents.

During the first part of the year a prototype web application has been developed which tests a user on two different types of perception - the ability to find defined objects in a scene and the ability to spot changes in a scene, the aim is to discover if people are typically good at one or the other of these tests, or strong in both.

The application has undergone initial user testing and is now ready to be finalised and then used as part of a study in the forestry environment.

Summer Research 2016/17

Project Abstract



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Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	11
Supervisor/s:	Yoonsuh Jung		
Project Title:	Efficient model selection in linear and nonlinear quantile regression		
Faculty:	FCMS	Field:	Statistics

EXPECTED OUTCOMES:

The analysis of real data sets and simulated data sets with the modified check loss function. The outcomes of this research are planned to be a part of future publication in an international peer-reviewed journal in Statistics.

STUDENT TASKS:

1. study and learn quantile regression
2. understand the core difference between model construction and model validation
3. find out the data set of the student's interest with multiple explanatory variables
4. need to find linear and non-linear data showing heteroscedasticity
5. write the code in statistical software R (sample code will be given)
6. write the summary of findings

REQUIRED SKILLS:

1. Programming experience in R.
2. Has undertaking at least one 300 level statistics paper. (suggested)
3. Has undertaken math papers such as linear algebra or matrix algebra.(optional)

PROJECT ABSTRACT:

To see the full distributional view of the data, quantile regression is commonly used. In contrast to the traditional mean regression, quantile regression can measure not only the central trend of the data, but also can estimate the trend of the low percentile and/or high percentile.

It can be extremely useful when certain percentile of the data shows very different pattern compare to the other percentile and vice versa. The pattern of the expenditure on alcoholic beverage is a well-known example. Some related data sets reveal that those with high income show very different in their buying pattern compared to those with low income as the cost of alcoholic beverage increases. Thus, the mean regression, which only measures the central trend of the data between the cost of alcoholic beverage and expenditure cannot detect the different trends between the lower and upper quantile of the data.

Check loss function is used to define quantile regression instead of the squared error loss. It is known to be robust to the outlying observations and can produce median regression. When there are several variables to be considered, often we want to select 'good' explanatory variables that can explain the outcome variable. This procedure implies the variable selection methods should be employed. For this purpose, cross-validation is commonly used.

As a form of loss function, again, the check loss function is often used rather than the squared loss function in the validation procedure especially when underlying truth is unknown. However, our empirical study indicates that the validation with check loss often leads to choose an over estimated fits. Thus, we believe there is a room for improving the check loss as a validation function.

In this work, we want to explore a modified or L2-adjusted check loss which rounds the sharp corner in the middle of check loss. Our initial exploration shows that it has a large effect of guarding against over fitted model in some extent. By analysing various types of real data sets, and by the simulation studies with linear and non-linear quantile regression models, the improvement of check loss will be examined. This adjustment will be devised to shrink to zero as sample size grows, so that we can have a consistent validation function.

The students who are interested in and/or seeking for postgraduate degree in Statistics would be an ideal candidate.

Summer Research 2016/17

Project Abstract



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Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	12
Supervisor/s:	Ryan Ko		
Project Title:	Unlocking Ransomware		
Faculty:	FCMS	Field:	Cyber Security

EXPECTED OUTCOMES:

1. Literature review of ransomware unlocking techniques.
2. Proof-of-concept for a generic ransomware unlocking technique.

STUDENT TASKS:

1. Create a sandbox environment for malware analysis
2. Analyse existing Anti-ransomware tools
3. Present an overview of the ransomware solution landscape and research problems
4. Design a proof-of-concept for a generic ransomware unlocking technique
5. Implement a proof-of-concept for a generic ransomware unlocking technique
6. Unit testing of proof-of-concept for a generic ransomware unlocking technique
7. Documentation for the source code

REQUIRED SKILLS:

1. C programming language
2. Appreciation of the assembly language
3. Interest in disassemblers
4. Analytical skills

PROJECT ABSTRACT:

Ransomware is malicious software which encrypts a victim's computer and can only be unlocked via ransom payment to the hackers involved. Ransomware is also becoming prevalent and fast becoming one of the top threats to every day computing users. Recently, some anti-virus companies such as Trend Micro has released free-to-use ransomware decryption tools but they are mostly only able to unlock limited types of ransomware.

This project has two main objectives: (1) a comprehensive analysis of the capabilities and limitations of these tools and their approaches, and (2) an initial development of a proof-of-concept for a proposed generic ransomware unlocking technique. The student will also be working with the Cyber Security Lab's industry partners to access related tools and seek advice.

Summer Research 2016/17

Project Abstract



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Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	13
Supervisor/s:	Sivadon Chaisiri		
Project Title:	Deploying Data Provenance Tools in Cloud Computing: Deployment Approaches and Evaluation		
Faculty:	FCMS	Field:	Cyber Security

EXPECTED OUTCOMES:

1. Survey of deployment approaches on public cloud providers
2. Prototypes of deployment package for Progger
3. Benchmark and evaluation results of provenance logging tools on public clouds

STUDENT TASKS:

1. Study existing Progger architecture
2. Survey deployment approaches on public cloud providers
3. Design deployment package
4. Implement deployment package
5. Benchmark and evaluate Progger on public clouds
6. Documentation of the source code

REQUIRED SKILLS:

1. C/C++ programming language
2. Unix environment
3. Basic knowledge on operating system internals
4. Analytical skills

PROJECT ABSTRACT:

Data provenance loggers allow users to know "what has happened to my data" in a system. Previously the Cyber Security Lab has developed "Progger", a provenance logging tool, and has deployed it on private clouds through a proprietary architecture.

The main objective of this project is to study how we can deploy Progger in public cloud providers, e.g. Amazon EC2, Azure, and Google Compute Engine. The student will also implement a package (e.g. AMI for EC2) for deploying Progger, making Progger easier to install (e.g. using apt-get or yum). The student will also evaluate Progger and its competitive loggers in a public cloud environment.

Summer Research 2016/17

Project Abstract



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Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	14
Supervisor/s:	Sivadon Chaisiri		
Project Title:	Implementation of Tamper-Evident Data Provenance in a Virtual Environment		
Faculty:	FCMS	Field:	Cyber Security

EXPECTED OUTCOMES:

1. Review of integration approaches of TPM on a virtual machine
2. Extension of tamper-evident framework on virtual machines
3. Benchmark and evaluation results of extended framework on virtual machines

STUDENT TASKS:

1. Study existing architecture using Trusted Platform Module
2. Study integration approaches of TPM on a virtual machine
3. Integrate TPM on a virtual machine
4. Deploy and test extended framework
5. Benchmark and evaluate extended framework
6. Documentation of the source code

REQUIRED SKILLS:

1. C programming language
2. Appreciation of the assembly language
3. Basic knowledge on operating system internals
4. Analytical skills

PROJECT ABSTRACT:

Data provenance helps a user to understand "what has happened to my data" in a system, however a rigorous proof of integrity is required in order for the data provenance to be used as admissible digital evidence in courts of law. Previously the Cyber Security Lab has developed a tamper-evident framework to capture data provenance using a widely-available hardware security chip: the Trusted Platform Module (TPM). The main objective of this project is to extend the framework and integrate TPM into a virtual machine (e.g. VMWare hypervisor). The student will be working with the Cyber Security Lab's industry partner to test and deploy the extended framework. The student will also benchmark and evaluate the performance on the extended framework using real-world test scenarios.

Summer Research 2016/17

Project Abstract



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ACADEMIC PROJECT SUBMISSION DETAILS:		Project #: 15
Supervisor/s:	Harris Lin	
Project Title:	Pattern Recognition for Provenance Data	
Faculty:	FCMS	Field: Machine Learning, Cyber Security

EXPECTED OUTCOMES:

1. Prototype framework to discover frequent occurring patterns from provenance data
2. Report of result evaluation based on the provided datasets

STUDENT TASKS:

1. Study existing graph database architecture
2. Design queries to obtain provenance sub-structures
3. Extract features relevant for clustering
4. Apply clustering on sub-structures
5. Evaluate identified patterns
6. Documentation of the source code

REQUIRED SKILLS:

1. Java programming language
2. Basic knowledge on data mining (Weka preferred)
3. Analytical skills

PROJECT ABSTRACT:

Provenance captures the history of what has happened to the data in a system (e.g. which programs modified which files at what time). Discovering patterns on such provenance data allows us to better describe any common recurring history, which improves visualisation and assists in detecting anomalies and potential intrusions in the system. This project focuses on identifying structured patterns stored in an existing graph database, using graph queries.

The student will learn how to construct graph queries to retrieve sub-structures, apply standard clustering techniques from machine learning to evaluate the outcome, and interpret the identified patterns in terms of data provenance. The student will evaluate the approaches on several real-world datasets including the Cyber Security Lab's industry partner.

Summer Research 2016/17

Project Abstract



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Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #: 16
Supervisor/s:	Harris Lin	
Project Title:	Distributed and privacy-preserving analytics for collaborated police intelligence	
Faculty:	FCMS	Field: Crime Science, Data Science

EXPECTED OUTCOMES:

1. Prototype of distributed analytics framework to answer intelligence-related questions
2. Evaluation report on the capabilities for police intelligence

STUDENT TASKS:

1. Study data requirements for police intelligence
2. Prepare a representative distributed dataset
3. Design distributed analytics framework
4. Implement distributed analytics framework
5. Evaluate capabilities of the framework for police intelligence
6. Documentation of the source code

REQUIRED SKILLS:

1. Database management
2. Basic knowledge on data mining
3. Programming skills (at least one of Java/C#/C++/Python)
4. Analytical skills

PROJECT ABSTRACT:

Solving and preventing crimes requires data-intensive investigations and real-time analytics with data from potentially multiple stakeholders (e.g. hospitals, transport, etc). However, investigations may be delayed due to the large amount of data to be integrated, their physically distributed nature, and sometimes even blocked due to privacy regulations imposed on the external data. The main objective of this project is to explore whether we can improve police intelligence operations by integrating only statistical summaries of data from relevant sources without exposing the actual data to protect their privacy.

The student would work with NZ Police to start from a case scenario and design a distributed analytics framework (e.g. a set of query-answering databases), implement a prototype, and evaluate its potential to answer intelligence-related questions.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
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Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	66
Supervisor/s:	Nick vanderschantz, Annika Hinze		
Project Title:	Extending the KidsQuestions Internet Search Engine		
Faculty:	FCMS	Field:	Computer Science

EXPECTED OUTCOMES:

We anticipate three central outcomes of this scholarship:

1. Further development of a recently tested internet search engine prototype that has been developed for use by children. This prototype will then be ready for further user studies, particularly longitudinal studies within schools.
2. A completed pilot user study with adult users of this internet search engine. This pilot study will also have been analysed and the results of which ready for development into an initial conference paper and confirmation of the method for further studies with adult users.
3. It is expected that conference and journal publications from this research will result. Targeted journals and conference's include the top tier journals - Computers and Education and the Journal of the Association for Information Science and Technology.

STUDENT TASKS:

1. Continue the Development of KidsQuestions Web ApplicationThe student will undertake computer searches for defining sets (if the student has programming skills).
2. Develop a Pilot User Study with New Participant Group (adults)

REQUIRED SKILLS:

1. Strong web programming skills including html, css, php, javascript, mysqlProgramming skills may be helpful but are not necessary
2. Well organised with strong communication skills

PROJECT ABSTRACT:

This project builds on research in the computer science department that investigates children's digital information seeking. A prototype internet search engine that we call KidsQuestions has been developed and tested with children in schools throughout the Waikato. Findings from this investigation have been extremely positive and indicate the potential for further investigations. During this summer scholarship we will further develop the KidsQuestions search engine prototype into a robust system that can be deployed in NZ classrooms for longitudinal studies. Additionally we will prepare for new studies with adult users.

ABSTRACT CONTINUES:

The student will - undertake further web application development based on the findings of previous studies; - implement new user logging features to provide further functionality for future studies; - develop and undertake a pilot study with adult users. The student will benefit from the development of their web programming skills, key research skills for use in computer science and graphic design research and practice. This project will provide a stepping-stone to further postgraduate research opportunities as the student will be introduced to experiment design considerations and results analysis.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	21
Supervisor/s:	Jeanette Clarkin-Phillips & Kirsten Petrie		
Project Title:	Get them while they are young: Physical health interventions in early childhood education		
Faculty:	FEDU	Field:	Health, Education, Sport/Physical Activity

EXPECTED OUTCOMES:

1. Comprehensive coded database of external provision of physical activity programmes and resources will be produced
2. Discourse summary/map of key Ministries' and government-funded resources/policies associated with physical activity and physical health Under Five's
3. An academic peer reviewed article drafted in collaboration with scholarship supervisors for Early Childhood Folio

STUDENT TASKS:

1. Document analysis of key Ministries' and government-funded resources/policies to examine discourses associated with physical activity and physical health Under Five's
2. Comprehensive database and summary of external provision of physical activity (including sport, fundamental movement skill, perceptual motor programmes, fitness, play, outdoor activity, etc) programmes and resources*

REQUIRED SKILLS:

1. Internet search skills
2. Ability to think critically
3. High level of communication skills, oral and written
4. Preferable: experience with basic database development (Excel) and ability to extract data sets

PROJECT ABSTRACT:

Growing concerns about the health of our New Zealanders, and a desire to protect against future ill-health has lead to preschool-aged children being positioned as at risk and vulnerable. This concern has generated an increased sense of urgency and a call by many (government, public health professionals and researchers) for early intervention and increased prevention efforts.

A survey we completed in 2015, and the recently published summary of research on physical activity and screen use in early childhood education (from the Growing Up in NZ project) highlighted that early childhood centres appear to be utilising a range of health promotion programmes' to support children's physical activity engagement. What is not clear is the full extent of the programmes on offer and how these align with government policies, including Te Whāriki (national early childhood curriculum, Ministry of Education), NZ Health Strategy (Ministry of Health), and the Physical Literacy Approach (Sport NZ), and what such programmes mean for young children's learning and holistic development.

This summer scholarship provides the opportunity to clarify the nature, purpose and potential outcomes of health promotion programmes' in early childhood education, and as such has ramifications for our health, education and sport communities. The scholarship research will be documentary and web-based, confined to publicly available information (internet searches and where available physical search of resources, pamphlets/flyers and advertising material). It will enable the successful applicant to develop important research skills in document analysis, data searching, data collation, analysis and reporting. The project is also recognised as a potential foundation for development of a masters or doctoral research project.

Task one of the scholarship project will involve a document analysis of key Ministries' and government-funded resources/policies to examine discourses associated with physical activity and physical health Under Five's.

Task two will involve a systematic audit of the organisations and agencies involved in physical activity in early childhood education nationally (i.e national providers), and specifically in the Waikato and Bay of Plenty regions. The regional aspect of the project reflects that there is a need contain the scope of the summer scholarship, given the diversity of small-scale programmes being offered across Aotearoa New Zealand. With guidance from supervising staff, publicly available information will be gathered and analysed to address: (i) what resources and/or instruction external providers are offering; (ii) the different age ranges programmes and resources are directed towards; (iii) the nature of the funding and programme provider's qualifications/expertise; (iv) the alignment between programmes and government policy.

It is anticipated that a comprehensive database of external provision of physical activity programmes and resources will be produced, together with standardised summaries for each provider/resource.

These outputs will be an important resource for further research development in Faculty of Education and the Faculty of Health, Sport and Human Performance. The successful applicant will also have the opportunity to work with experienced researchers in the Faculty of Education to co-author a refereed journal paper from this work

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
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Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	23
Supervisor/s:	Mira Peter & Elaine Khoo		
Project Title:	Arguing to learn and learning to argue: The role of peer-peer discussion in learning threshold concepts and competencies in a flipped classroom		
Faculty:	FEDU	Field:	Education/Psychology

EXPECTED OUTCOMES:

1. A short report based on the outcomes of the analyses
2. A draft article for a journal publication
3. A possible outline for a conference presentation.

STUDENT TASKS:

1. In week 1, the successful student will become familiar with the project, and refer to the literature on threshold concept theory, flipped class model, and argumentation theory to gain a better understanding of these areas. In this stage the SRS may contribute to collating and or identifying new and/or relevant literature on student argumentation and learning.
2. In weeks 2 and 3 the student will clean and prepare the video data for analysis, work with the research team to design a coding scheme, run a small trial coding on selected video(s) and make refinements where necessary.
3. In weeks 4-9 the student will analyse the video data to assess for the quality and patterns of argumentation and how these contribute to students' learning of threshold concepts.
4. In week 10 the student will prepare a short report of the outcomes of the analysis and will help draft a journal article for publication in an educational journal of which the student will be offered co-authorship.
5. The student will participate in team meetings and provide weekly progress reports to the research team.

REQUIRED SKILLS:

1. Familiarity with using the Nvivo qualitative data analysis software package.
2. Good quantitative data analysis skills using the Excel and SPSS software
3. Good qualitative data analysis skills.
4. Good time management skills.
5. Good general word processing skills
6. Good communication and writing skills

PROJECT ABSTRACT:

Each academic discipline includes special, difficult concepts (known as threshold concepts) that when grasped can reveal new and previously inaccessible ways of thinking about that subject. In order to think like a subject specialist it is imperative for students to master these concepts. In this two-year Ministry of Education funded research project (2015-2017), the lecturers in a first-year electronics engineering course adopted a 'flipped classroom' model of teaching and learning and redesigned the course such that face-to-face lectures are replaced with a series of short online videos assigned as take-home tasks and the time in class is spent on students' small-group problem solving activities. These activities are envisioned to provide students with opportunities to test and practice their understanding and help them master threshold concepts and develop non-technical competencies (e.g., communication and teamwork) associated with being a successful engineer.

The aim of this summer research project is to uncover how a flipped classroom influences students' learning of threshold concepts through the analysis of students' discussions when solving problems in collaboration with their peer(s). Because earlier research has shown that peer-peer discussions can be effective in improving students' reasoning and addressing background knowledge and misconceptions we plan to analyse data collected from video recordings of student collaborative problem-solving activities and search for instances of argumentative, collaborative dialogues (e.g., offering justification, taking a position, reflection, debating) and changes in their quality and/or frequency.

By participating in this project, the student will learn about threshold concepts, the flipped classroom model of teaching and learning, and the analysis of video data to identify distinct types of student argumentation and how they contribute to learning.

An opportunity also exists for the student to work with a visiting scholar, from Germany, with expertise in video-based methodologies who will be visiting our team this summer. In this way the SRS will develop practical and critical understanding of video-based methodologies and analysis in an educational research environment. Most important, the student will be part of a cross-disciplinary team of researchers (engineering and education) working on a common problem to understand ways to enhance student learning, share exciting ideas, discuss theoretical and practical issues with experienced researchers, and potentially develop their own line of research in the use of educational videos and flipped class model in teaching and learning.

This summer research scholarship will support and nurture the student as an emerging researcher and will support the university's overall research strategy to enhance and promote pathways for students into postgraduate research.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	24
Supervisor/s:	Mira Peter & Jayne White		
Project Title:	What's the fuss all about: First year students' practicum experience with infants and toddlers		
Faculty:	FEDU	Field:	Education/Psychology

EXPECTED OUTCOMES:

The research findings will be reported in peer-reviewed journal and conferences; this will be done in a way that does not identify individuals and limits the possibility of identifying the university.

STUDENT TASKS:

1. In the first phase, in week 1, the student will become familiar with the project, the infant pedagogy and the role of practicum in teacher education. In this stage the SRS will also help with collating and synthesising scholarly papers on these topics.
2. In week 2 the student will import practicum reports sent from various universities into NVivo software. The student will clean and prepare data for analysis and will together with educational researchers design coding scheme for qualitative analysis and run a pilot coding on selected report(s).
3. In weeks 3-9 the SRS will analyse data based on generated codes and prepare a summary of findings report.
4. In week 10 the student will help prepare a draft of a journal article for publication in an a reputable early childhood education journal.
5. The student will report weekly to the educational researchers and will attend regular team meetings.

REQUIRED SKILLS:

1. Good data analysis skills using NVivo software.
2. Basic knowledge of qualitative data analysis.
3. Good critical thinking skills; ability to search data bases and synthesise scholarly papers.
4. Excellent time management skills.
5. Efficiency in beginning and ending projects on time.
6. Skilled in report writing.

PROJECT ABSTRACT:

The Summer Research Scholar project is a part of the larger international project - CUPID (The Collaborative for Understanding the Pedagogy of Infant/toddler Development) which brings together a number of scholars from universities in New Zealand and Australia to work together in order to understand how to better educate the infant/toddler workforce through higher education.

The goal of the Summer Scholar project is to analyse the experience of the first-year early childhood education (ECE) undergraduates who work with under-three year-olds during their practicum. In this project we want to understand what student teachers are learning during their practicum experience of infants/toddlers and what helps or hinders their learning about the development, care, and education of infants and toddlers. Students' reports on their practicum visits with under three year olds will be used as data.

The results of this study will provide important information about how student teachers' infant and toddler knowledge and pedagogy is developed through feedback from lecturers and associate teacher in their first year of study. The results of the analysis of these reports will shed light on the variety of teacher education practices and values that shape the graduates of each programme and, ultimately, the infants and toddlers they teach once they graduate.

Moreover, the study will illuminate the impact of diverse curriculum and teacher education practices on the values and beliefs that underpin preparation of students for work with infants and toddlers. In this way the results will help develop and provide a relevant, research-informed, socially and culturally responsive undergraduate early childhood education curriculum and strengthen links between applied research and academia. By taking part in this research the student will learn first hand about curriculum and teacher education practices, will enhance his/her use techniques of qualitative data analysis, and learn how to write a journal article for publication. Most important, the student will be part of an international team of experts working on a common problem and learning from each other.

The student will be able to discuss theoretical and practical issues with experienced researchers and potentially develop his/her own line of research in early childhood education and/or human development. In this way the summer research scholarship will support a new and emerging researcher as an integral part of the university's overall research activity and enhance and promote pathways into postgraduate research.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	18
Supervisor/s:	Belinda Wheaton & Holly Thorpe		
Project Title:	The International Olympic Committee [IOC] seeks Generation Y: Action Sports' inclusion in Tokyo 2020		
Faculty:	FEDU	Field:	Sport sociology, sport media, action sports.

EXPECTED OUTCOMES:

The data emerging from this project will form an important part of a forthcoming research monograph (authors Thorpe & Wheaton), and subsequent journal articles (x3). It will also help to secure the productive relationship between the Researchers./University of Waikato and the IOC, one of the most powerful sporting bodies in the world .

STUDENT TASKS:

1. Media collation: reviewing webpages, and on line data bases, and systematically collating information. Inputting various media sources into Endnote
2. Coding article in themes (pre assigned by research team)
3. Write up the media data into themes for analysis
4. Setting up focus groups
5. Helping the researchers conduct focus groups
6. Transcribing interviews

REQUIRED SKILLS:

1. Communication skills: Verbal and written
2. Ability to source, read and summarise relevant academic literature
3. Effectively use library database and search engines
4. Ability to source a wide array of media content and identify relevant information.
5. Data organization skills
6. Time management

PROJECT ABSTRACT:

This project will give the student a chance to work on a high profile project and very topical issue, working with a team that are international leaders in their field. The proposed research builds on a highly topical project titled Youth Perceptions of the Olympic Games: Attitudes Towards Action Sports at the YOG and Olympic Games (conducted June 2015-June 2016), and funded by an International Olympic Committee (IOC) Advanced Research Programme Grant..

The IOC is seeking to address the problem of an ageing audience with the inclusion of more youth-focused action sports in the Olympics; this is evident from the shortlisting of surfing, skateboarding and sport climbing for inclusion in the Tokyo 2020 Olympics. Our research focused on the attitudes of participants in action sports, particularly on the cultural processes of potential inclusion. Online surveys, media analysis and interviews including with key members of the global action sport industry (in the media, event management, sports agents, elite performers and members of sport federations) provided rich insights into the experiences, debates and politics that influence youths' current and future participation in, and consumption of, the Olympics. The research highlights the power and potential of action sports inclusion into the Olympic Games, and the ongoing and new challenges.

The objective of this new research is to update our project by examining the impact of the formal announcement at the Rio Summer Olympic Games. The project will involve 2 methods:

1. An analysis of the mass media and subcultural nichemedia's reaction to skateboarding, surfing and climbing being included (or excluded) in the Tokyo 2020 Olympic Games. As illustrated in our completed project (2016), the action sport media, such as niche magazines and websites, including the comments sections, are particularly influential in communicating attitudes and value within and across action sport cultures. We worked with a summer scholar to collate and organize over 650 media sources relating to action sports relationship with the Olympic Games. We also developed a data based and themes for analysis.
2. Focus groups with action sport participants to explore generational differences in attitudes to Olympic inclusion. The focus groups will explore action sport participants' responses to the decision, the implications for their sport, and participants' knowledge of the process. We are particularly interested in differences in opinions based on gender and age. Generational differences were an important theme that emerged in our previous study. Younger participants tended to embrace the inclusion of action sports whereas old(er) participants tended to hold on to anti-establishment philosophies from these sports histories. There were also some gender differences particularly across sports.

Our sample will constitute a mix of participants who practice their activity on regular basis in one of the sports that will be included in the Olympics (surfing, skateboarding, sport climbing) and YOG (BMX freestyle and kitesurfing). We will hold 4 focus groups, 3 with participants of different ages (Under 19, 20-35 and over 45) to explore intergenerational differences, and one with women and girls only, across ages. We also intend to conduct a second phase of interviews with the global action sport industry in the run up to Tokyo 2020.

We are in ongoing conversations with the IOC about the next phase of this project, and it is hoped that we will continue to work with IOC to inform their policies about the future of the sporting landscape. The collective research from these 3 phases will form the basis of a research monograph for which we are currently seeking a publisher, and inform the 3 journal articles planned

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	28
Supervisor/s:	Brett Smith		
Project Title:	Chiefs rugby club database development		
Faculty:	FEDU	Field:	Mathematics and Computer Science

EXPECTED OUTCOMES:

Development of an effective database

STUDENT TASKS:

1. Work with Chiefs to complete the development of their database
2. Ensure easy and efficient integration of data from various New Zealand Rugby Union databases
3. Develop an effective user interface
4. Develop effective and concise reporting structures.

REQUIRED SKILLS:

1. Computer science skills
2. Database development
3. Self motivated

PROJECT ABSTRACT:

The Chiefs rugby club is completing development of an online database to encompass all it's health and performance metrics. **To help support this development the Chiefs are looking for two summer scholarship students** with skills in computer science and mathematics.

The successful students will would work alongside the team leadership, analysts, sport scientist and contracted open source programmers to explore strategies for enhancing the database and more importantly developing effective reports and analytics. One of the students will focus primarily on the database development, ensuring easy and efficient integration of data from various New Zealand Rugby Union (NZRU) databases, developing an effective user interface and concise reporting structures. The other student will focus primarily on analysis of the data, e.g. exploring relationships between injuries and various types of training workload, exploration of models of match analysis, the continued development of training and match KPI's etc.

While this is a Chiefs based project the NZRU can offer technical and educational support in this area especially in the area analytics providing access to (and education on) SAS (including SAS Visual Analytics). This is an opportunity for students to gain a unique and valuable experience in applying mathematics and computing in

professional sport and has the potential for providing a head start into a rapidly growing area of employment. The students will be required to sign and abide by strict confidentiality agreements around this project.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	19
Supervisor/s:	Rich Masters & Paul Cowan		
Project Title:	Using virtual reality to train decision-making skills in sport		
Faculty:	FEDU	Field:	movement science; human performance psychology; IT

EXPECTED OUTCOMES:

The work will establish the feasibility of using virtual-reality for training in sport. The work is expected to provide a basis for empirical research into the efficacy of virtual-reality for training decision-making skills in sport. Peer-reviewed international publications are likely. Future work will examine the value of using the same approach when learning movement skills, with a view to using virtual reality in clinical movement rehabilitation settings.

STUDENT TASKS:

The student will:

1. become familiar with use of virtual-reality technology
2. develop a virtual-reality decision-making task
3. pilot-test the efficacy of the virtual task for training better decision-making

REQUIRED SKILLS:

1. An interest in virtual reality systems and their use for research
2. A good level of digital literacy
3. An interest in the way in which people learn and perform skills

PROJECT ABSTRACT:

In most sports, good decision-making plays a significant role in the success or failure of a player or team. Good decision-making in sport is one of the most challenging psychological skills to train. Athletes/players typically do not have an opportunity to improve their decision-making skills through repetition, because ecologically realistic scenarios in which to practice their decision-making are very difficult to construct. Consequently, coaches rely on game time and experience to up-skill the decision-making abilities of athletes/players. Recent improvements in virtual reality technology offer a potential solution to this problem. Virtual reality technology is now flexible and economically viable for coaching.

The aim of this project is to develop a virtual decision-making protocol in rugby and to pilot-test the efficacy of the protocol for training decision-making by rugby players in real-time, real-life situations. This project represents a unique collaboration between Prof Rich Masters (human performance psychology) and Mr Paul Cowan (Manager, Innovation & Technology) of the Faculty of Education.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	20
Supervisor/s:	Karen Barbour		
Project Title:	Community activism through performance		
Faculty:	FEDU	Field:	Performing Arts and Dance

EXPECTED OUTCOMES:

1. an annotated bibliography on community activism through the arts;
2. participate in the creative process in developing a dance performance;
3. Contribute to documenting the creative process. (The student might also perform in public performances with Waikato Contemporary Dance Projects Trust. This will be dependent on the skills and availability of the successful student).

STUDENT TASKS:

1. Create an annotated bibliography on activism in art and performance
2. Participate in the creative process in developing a performance
3. Record aspects of creative process through photography, video, sound recordings and journal entries

REQUIRED SKILLS:

1. Excellent written and oral communication skills
2. Library and internet research skills
3. Experience in creative processes for performing arts
4. Experience in dance
5. Basic photography, video and sound recording skills

PROJECT ABSTRACT:

Social and environmental activism is becoming more performative in seeking to engage a wide range of community members in both local and global concerns. For example, raising awareness about the international refugee crisis and climate change and anti-racism campaigns (Shapiro & Shapiro, 2015). Drawing on research and practice in professional and community dance, the scholar will research community activism through art practices and particularly through dance performance.

The scholar will begin by familiarising themselves with the literature and current examples of community activism through arts practice, in order to prepare an annotated bibliography of relevant material and using Zotero..

Consequently, researching literature, media and various art practices will necessitate use of advanced library and online research skills across a range of academic and artistic disciplines (such as dance studies, community and social psychology, sociology, community development, social and environmental activism, artistic and creative practice). Creativity in presentation of the annotated bibliography is encouraged particularly to link to websites and social media platforms. Mentoring and support will be provided by the project supervisor. The scholar will also participate in and reflect on the creative process involved in creating a dance performance that may engage with local issues of concern in the creation of activist performance. This will involve working with members of Waikato Contemporary Dance Projects Trust, requiring adaptability from the scholar in working alongside both professional and community artists.

The scholar should have a background in dance and/or theatre creative practice, and it would be particularly valuable to have experience in contemporary dance. They should be willing to contribute to the creative process including potentially performing with Waikato Contemporary Dance Projects Trust. Part of this contribution may include documenting the process through recording video, sound, still images and journal entries based on observations.

As research in the performing arts can be represented in a range of ways (written, performative, images, oral), this Summer Scholarship offers the successful student experience learning about performative research outputs and the process for writing about creative practice as research. Consequently, this opportunity will assist in developing the scholar's research skills, understanding of writing processes and creative practice that will support them moving into further studies and future employment

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	25
Supervisor/s:	Bronwen Cowie & Prof Janis Swan		
Project Title:	Are Women Attracted into Engineering at Waikato: If not, why not?		
Faculty:	FEDU	Field:	Engineering Education research

EXPECTED OUTCOMES:

1. An up to date synthesis of current research and institutional initiatives (media) to recruit and support female engineering students.
2. An understanding of the Waikato context for the teaching and learning of female engineering students and their perceptions of this
3. Recommendations for further research and ideas for implementation/innovation within the Waikato programme
4. An academic paper in suitable for an engineering education journal. Input into the Engineering E2E project (Prof. Swan is on the project's Steering Committee, which is chaired by Sir Neville Jordan).

STUDENT TASKS:

1. Carry out a literature search on perceptions of engineering as a career for women, focussing on NZ publications (where possible).
2. Carry out a literature search on support systems for women engineering students.
3. Carry out a scan of media that aims to recruit and promote female student engagement in engineering.
4. Analyse university policy and programmes that could support women engineering undergraduates.
5. Investigate engineering class materials (PowerPoints, class notes, laboratories) to identify examples of possible gender bias.
6. Conduct and report on interviews with women engineer lecturers and students.
7. Co-authoring a paper for an engineering education journal.

REQUIRED SKILLS:

1. Critical reading, analysis and synthesis and writing skills needed to prepare a technical summary of research papers, media and university policy and teaching materials.
2. Interpersonal skills that support ability to conduct interviews that probe ideas and experiences.
3. Ability to undertake analysis of interview data, with support.
4. Communication and teamwork skills.

PROJECT ABSTRACT:

Despite developments in STEM in middle and high schools, women are still typically underrepresented in engineering programmes. For example, they represent only 10-16% of the UoW cohort over the past 10 years. Women who decide to study engineering need to overcome the initial perception that engineering is a "boys club". They often face unintentional gender bias in teaching and in the teaching resources used. Given that one of the aims of the School of Engineering (and the University) is to develop and extend the engineering programmes, tapping into women who are good at math and physics but have not considered engineering is one of the easiest ways to rapidly increase our engineering enrolments.

This project has four aims:

- (i) to find out from current women engineering undergraduates why they chose to study engineering at Waikato,
- (ii) to identify if and how they consider the programmes are gender biased
- (iii) to identify what kinds of support they are currently receiving and what they would like receive, and
- (iv) to identify programmes that would encourage women to consider engineering as a career.

The data collected will build on research on engineering education via the Waikato Engineering Education Unit. The Unit includes researchers from WMIER, Faculty of Education and the School of Engineering. Its research programme includes studies on threshold concepts within the curriculum, flipped classrooms as a means for fostering communication and collaboration skills, and online tutorials as a tool for supporting learning. It has not as yet focused in on the particular needs and interests of particular student groups. This study picks up local and international concerns around the level of participation of female students.

The project involves a search for research on how younger women perceive engineering. Various women engineers have written about what they achieve as engineers (successful, challenging, and wide variety of jobs, chance to be innovate, group work, social and humanitarian projects, etc.). Individual successes have been publicised, see <https://www.youtube.com/watch?v=FEeTLopLkEo>). The search will encompass academic research and promotional media.

The scholar will also analyse current university policy and programmes that could support women engineering undergraduates and investigate how/ if other institutions have successfully recruited and supported women engineering students. The scholar will also seek to interview women engineers who are lecturers at Auckland, Waikato and Canterbury. The scholar will work with supervisors to synthesise and summarise themes from the various sources and co-author a paper for an engineering education journal. They will assist with developing suggestions for consideration by Waikato engineering programme leaders.

The project supports recent government (and TEC) initiatives on increasing STEM in schools and also the E2E Engineering project (funded by a TEC grant) promoting engineering as a career - see <http://www.engineeringe2e.org.nz/>. They will interview volunteer Waikato female engineering students to ascertain their experiences and views. Their views will provide a perspective to complement the Scholar's analysis of course materials.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	22
Supervisor/s:	Nadine Ballam		
Project Title:	The extent and nature of identification and provisions for gifted and talented students in New Zealand schools (working title)		
Faculty:	FEDU	Field:	Gifted and talented education

EXPECTED OUTCOMES:

1. An academic peer-reviewed article in draft (in collaboration between the research supervisor and scholarship recipient) for APEX: New Zealand Journal of Gifted Education or NZ Journal of Educational Studies.
2. A report outlining key findings of the research for the Ministry of Education.
3. Informal reports outlining key findings of the research for various stakeholder groups.

STUDENT TASKS:

1. Quantitative data analysis of data generated by nationwide surveys using a statistical analysis process. The scholar will assist with the input of data and work alongside other researchers to analyse this.
2. Semi-structured interviews with educators in the local community. The scholar will assist with carrying out these interviews
3. Thematic analysis of qualitative data from interviews, with support from the research supervisor.

REQUIRED SKILLS:

1. Statistical analysis. Experience with excel spreadsheets is an advantage
2. Ability to think critically
3. Collaboration/team work
4. High level of oral and written communication skills

PROJECT ABSTRACT:

While New Zealand performs reasonably well on educational indicators in general, there are some worrying trends that have emerged. One such concern is declining performance in reading, mathematics and science (according to reports such as PISA - Programme for International Student Assessment). This educational trend is a concern as it impacts on the government's goal of building a productive and competitive economy that positions New Zealand well on the global stage.

It also impacts on personal wellbeing, and the capacity of all New Zealanders to reach their full potential and contribute to the economy and society in meaningful ways. Gifted and talented learners, if nurtured well, are likely to contribute creatively and innovatively in New Zealand and global contexts.

Given the concerns about educational outcomes, it is timely to explore the ways in which New Zealand's gifted and talented learners are being catered for. The last major nationwide exploration of the state of gifted education in New Zealand was undertaken in 2004. That Ministry of Education-funded research project investigated identification and provisions for gifted students in New Zealand schools, and made several recommendations for policy makers and educators.

The proposed research project will explore the state of gifted education in New Zealand: what has changed over the last 12 years, and what the current strengths and limitations in provision for gifted learners are. The project will capture the voices of educators across all sectors (from early childhood education through to tertiary), as well as parents, whānau, other stakeholders, and gifted young people themselves. The nature of provision for Māori and Pasifika learners will also be explored.

It is envisaged that the scholarship recipient will develop skills related to semi-structured interviewing, collation and analysis of both quantitative and qualitative data, and reporting of findings. This research project will gather both quantitative and qualitative data from questionnaires sent to stakeholders (listed earlier), and a small number of semi-structured interviews undertaken with educators in the local community. It is expected that the scholar will work alongside the supervisor to analyse quantitative data using a statistical analysis process, and to carry out and thematically analyse interviews.

The scholar will also have the opportunity to co-author a peer reviewed journal article related to the data they work with during their scholarship period. An additional benefit will be the chance to build relationships with a range of people interested in gifted and talented education.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	26
Supervisor/s:	Margaret Carr & Bronwen Cowie		
Project Title	Young children visiting museum collections: locating creative teaching practices		
Faculty:	FEDU	Field:	Education

EXPECTED OUTCOMES:

1. The Summer Scholar will gain insight into a range of data collection methods and develop skills in selected data analysis techniques.
2. It is anticipated that the scholar will become a co-author of a scholarly paper for the wider Marsden project.

STUDENT TASKS:

1. Become familiar with the research project on information gathering or creative capacity building so far - selected readings and the data collected for young children and teachers before, during and after a museum visit.
2. With assistance from the supervisors, the Scholar will select a number of episodes from video- and audio-recordings already completed. These episodes will be chosen to identify the teaching practices to be analysed with the aims of the Marsden project in mind. Some of these selected episodes will not yet have been transcribed and the Scholar will transcribe them.
3. The Scholar will analyse the selected episodes to develop case studies of information gathering and creative capacity building strategies. The supervisors will provide a framework to assist with this. This research analysis will be combined with interview data and shared in discussions with the research team (including the Summer Scholar) to contribute to an academic paper, with the Summer Scholar as a contributing author.
4. A possible additional task will be to assist the supervisors to prepare images and information for the following websites: University of Waikato Early Years Research Centre, and the Royal Society. This will depend on the skills and interests of the Summer Scholar.
Prepare a poster on their project for the University of Waikato Summer Scholarship exhibition in 2017.

REQUIRED SKILLS:

1. An interest in young children's learning and creative teaching practices.
Pre-requisite
2. A strong interest in research methods and researching with teachers.
Some experience in data analysis and writing reports.
3. Some experience with transcribing audio data (at an introductory level).
4. Experience in working with a research team (this would be a bonus, not a requirement).
5. Desktop publishing skills. (This is on the wish list, rather than a requirement).

PROJECT ABSTRACT:

This Summer Scholarship project will contribute to a Royal Society Marsden project (April, 2014 - March, 2017) entitled 'Children visiting a museum: information gathering or creative capacity building?'. This Marsden Fund project works in partnership with Te Kohanga Reo me Te Kura o Mana Tamariki to investigate young children's creative inclinations to puzzle about the unknown, develop innovative working theories, and expect difference.

An assumption of the project is that this innovation potential of young children is a precious natural resource that is threatened in a world of readily packaged information. A museum visit (or a visit to places where taonga are housed) provides a unique design space that can protect and strengthen learner qualities such as: asking and pursuing questions; calling on prior knowledge to make connections across different disciplines, places and times; and taking risks to articulate a viewpoint and debate alternatives.

The aims for the Marsden project include providing evidence of the ways that children's innovation potential can be deliberately strengthened by teachers' practices before, during and after a well-designed museum visit. In 2014 data was collected from a kindergarten, and late in 2015 data was collected from new entrant classrooms in a school. We are now looking to develop case studies of creative teaching practices that will be valuable for the early childhood and school sector.

This Summer Scholarship project will work with video and audio data already collected. The supervisors will assist the Summer Scholar to choose episodes from the recordings of young children's interactions with teachers and 'buddies' (older children) during museum visits. The project data also includes interviews with teachers about their ideas and experiences before, during and after museum visits. The Scholar will assist the wider research team to identify the teaching practices designed to enable creative capacity building during a museum visit.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	27
Supervisor/s:	Margaret Carr & Brenda Soutar		
Project Title:	Tamariki in a kura kaupapa Māori: responses to taonga He Taonga, He Whakaohoho Wairua: Where there are taonga, the spirit is awakened		
Faculty:	FEDU	Field:	Education

EXPECTED OUTCOMES:

1. The Summer Scholar will gain insight into a range of data collection methods and develop skills in data analysis techniques and interviewing.
2. It is anticipated that the Scholar will become a co-author of a scholarly paper for the wider Marsden project.

STUDENT TASKS:

1. Become familiar with the research so far on the project - the data collected for younger children at te kohanga and kura, the interviews, and the paki ako (learning stories written by kaiako at te kohanga).
2. With assistance from the second supervisor at Te Kura Kaupapa Māori o Mana Tamariki in Palmerston, the Scholar will select a number of episodes from the video-recordings already completed. These episodes will be chosen to illustrate the aims of the Marsden Fund project, and to build on the work so far. Episodes chosen will be transcribed into te reo Māori. Other aspects of the video-recording, beyond the spoken words, will be added to the transcription.
3. The Scholar will interview kaiako, pouako and the principal at Mana Tamariki (kohanga and kura) to seek their views on interpreting the episodes. These interviews will be transcribed.
4. A possible additional task will be to assist the supervisors to prepare images and information for the following websites: University of Waikato Early Years Research Centre, and the Royal Society. This will depend on the skills and interests of the Summer Scholar.
5. Prepare a poster on their project for the University of Waikato Summer Scholarship exhibition in 2016. Some episodes will be translated into English for this purpose.

REQUIRED SKILLS:

1. Fluency in te reo Māori.
2. Transcribing te reo Māori. (Experience of transcribing young children's comments and non-verbal communications would be a bonus).
3. Translation of some episodes into English.
4. Prior experience with interviewing, video and audio-recording would be a bonus, but not a requirement.
5. Desktop publishing skills. (This is on the wish list, rather than a requirement)

PROJECT ABSTRACT:

No te tau 2014, ka tumata tu nei kaupapa rangahau i roto i Te Kohanga Reo o Mana Tamariki. He whānau kotahi Te Kohanga Reo o Mana Tamariki me Te Kura Kaupapa Māori o Mana Tamariki, e ako ana i te whare kotahi, i raro i te tuanui kotahi, I tā rā tau 2015 i whakawhitia te kaupapa rangahau ki Te Kura Kaupapa Māori o Mana Tamariki. This research project began in 2014 with Te Kohanga Reo o Mana Tamariki. Mana Tamariki is one whānau, learning in one building, under one roof, comprising Te Kohanga Reo o Mana Tamariki and Te Kura Kaupapa Māori o Mana Tamariki. Last year in 2015 the research project crossed over to the kura.

This Summer Scholarship project will contribute to a Royal Society Marsden project (April, 2014 - March, 2017) entitled 'Children visiting a museum: information gathering or creative capacity building?' This wider project builds on young children's creative inclinations to puzzle about the unknown, develop innovative working theories, and expect difference.

An assumption of the project is that this innovation potential of young children is a precious natural resource that is threatened in a world of readily packaged information. A museum visit provides a unique design space that can protect and strengthen learner qualities such as: asking and pursuing questions; calling on prior knowledge to make connections across different disciplines, places and times; and taking risks to articulate a viewpoint and debate alternatives.

The aims for the Marsden project include challenging monocultural definitions of innovation potential by investigating the combination of information gathering and creative capacity building in responses to museum visits by children from kohanga reo and kura kaupapa Māori. In 2014 data was collected from Te Kohanga Reo o Mana Tamariki and in 2015 from tamariki at Te Kura Kaupapa Māori o Mana Tamariki in Palmerton North. In 2016 we are still working with children in Te Kura Kaupapa Māori o Mana Tamariki as we begin to look towards the final stages of this project.

Building on the earlier research at te kohanga, the supervisor at Mana Tamariki will assist the Summer Scholar to choose episodes from video recordings of children's interactions with taonga in museums, particularly a school trip to Te Papa and the Dominion Museum, and other places where taonga are housed. These include a visit to Te Marae o Hine - Palmerston North, Taranaki and Parihaka Pa. In Wellington children began to develop their own theories regarding war through the Gallipoli and WW1 exhibitions. This year those same children are exploring the concept of peace, mediation and resolution to balance last year's focus. Visits this year to Te Marae o Hine in the Palmerston North Square and Parihaka are focussed around peace, mediation, resolution and passive resistance as upheld by the people of Parihaka under the leadership of their prophets, Te Whiti and Tohu. This data will include documentation by kaiako before and after, as well as during, the visits. Interviews with kaiako and pouako at Mana Tamariki will seek their views on the episodes.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	17
Supervisor/s:	Dianne Forbes		
Project Title:	BlendedLearning@Waikato		
Faculty:	FEDU	Field:	Tertiary Education

EXPECTED OUTCOMES:

1. 7 web-ready case studies for display on the University's CEP website: <http://www.waikato.ac.nz/cep/>
Each case will be comprised of: - a short (5 minute) video segment (MP4) showcasing the exemplar of blended learning, including clips of staff/students interviews, and in-class footage where appropriate.
2. A brief written explanation of the case in terms of how it exemplifies blended learning; the highlights and challenges involved; the impact on student learning/experience; and advice for colleagues. Note that the summer scholar will not be asked to edit the footage, but will be welcome to learn about the process if they are interested. Additional funding is provided by the CEP project (authorised by Dr Tracy Howell) to employ an ITS technician to undertake editing. Filming will be planned collaboratively by the project supervisor and summer scholar; raw footage will be captured by the summer scholar; footage will be viewed collaboratively by supervisor and scholar; leading to selection of clips by the supervisor; and editing of the clips into a montage by the ITS technician. The summer scholar will be invited to learn about the processes of planning, selecting, completing an Editing Decision List (EDL) template, and editing clips, to splice content, add music, captions and transitions. The main work for the summer scholar will involve interviewing participants and capturing raw video footage. This will provide the scholar with an opportunity to be among the first to be trained in using WMIER's new video lab (<http://www.waikato.ac.nz/wmier/video-lab>), alongside the supervisor.
3. journal publications e.g., VJEP (<http://pesa.org.au/news/general-news/155-the-video-journal-of-education-pedagogy-vjep>), informing policy and practice

STUDENT TASKS:

1. Assist with basic sorting and analysis of survey results
2. Interview and film case study participants
3. Search literature pertaining to blended learning, and to video interviews as a research method

REQUIRED SKILLS:

1. Digital literacy (tech savvy). Able to figure out basic tools like survey monkey, zotero, electronic databases, and camera equipment, given moderate time, input and training.
2. Confident communicator, enjoys working with people
3. Interviewing skills, an interest in interviewing, training will be provided, including guided reading of texts on the method, and practical modeling. For example, we will practice interviews, and record a couple together.

PROJECT ABSTRACT:

Blended learning (also known as hybrid or mixed-mode learning) occurs where a portion of the traditional face-to-face instruction is replaced by online learning. This can mean that students attend some lectures, tutorials or workshop/laboratory sessions on campus, while carrying out additional study tasks online via Moodle or a similar learning management system. It could entail a flipped classroom model, whereby expository content is delivered via video online, prior to interactive tutorials on campus.

Alternatively, blended learning may be part of block courses, where students attend on campus workshops at weekends, during summer school, or pre-semester blocks, while completing the rest of their coursework in the field and online. Blended learning is a popular way of enhancing access to university education among students who are at a distance from campus, in paid work, and/or juggling other responsibilities.

Particular cohorts such as elite athletes with strict training regimes and extensive travel find that blended learning can enable the flexibility to study alongside other pursuits. The key advantages of blended learning are depth, efficiency and flexibility, particularly in terms of being able to time-shift so that students and staff have greater choice over how and when learning and teaching occurs. As a teacher, I find working in a blended mode helps me to fit my teaching around family, research, administration, and service. Pedagogically, I appreciate the greater independence and choice afforded by technology, while also enjoying the rapport and togetherness of face-to-face sessions.

While blended learning is popular for a range of reasons, there are still those who resist changes to traditional models of university education due to concerns about disciplinary traditions, time management, skills required of staff and students, and skepticism relating to the quality of online teaching and learning. Nevertheless, blended learning is already happening at Waikato. Well-known examples include: Jonathon Scott's flipped classroom (Khoo, Peter & Cowie, 2015); Te Kura Toi Tangata Faculty of Education, Bachelor of Teaching, Mixed Media Programme, where students have qualified as teachers while studying online, attending block courses on campus, and spending time in base schools in their regions, supported by teachers, peers and lecturers (Forbes, 2016) It is highly likely there will be other examples of blended learning throughout the faculties on campus.

The goal of this project is to discover some of the examples, and to showcase a selection of these on the CEP website (<http://www.waikato.ac.nz/cep/>). The intent is to celebrate the positive work that is already taking place in terms of blended learning at Waikato, while probing some of the challenges so that these can inform future policy and practice. It is anticipated that showing examples of blended learning will raise awareness across the university and make the practices more accessible to academic staff seeking guidance about how to implement blended learning in various disciplines.

This research has the support of Dr Tracy Bowell, Pro Vice Chancellor Teaching and Learning, as part of the implementation of the CEP.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
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Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	29
Supervisor/s:	Leandro Bolzoni		
Project Title:	Formulation, production and characterisation of novel Ti-based alloys targeting (anti-)bio/fouling applications		
Faculty:	School of Engineering	Field:	Materials Science and Engineering

EXPECTED OUTCOMES:

This research project will allow us to formulate novel Ti-based materials, will generate easily publishable scientific data about the behaviour of new materials and will give us an insight about the deformation behaviour of the targeted alloys. The realisation of this project will set the basis for developing Ti-based materials with the ability to either promote or limit/prevent the bio/fouling effect normally detected in titanium. Further studies about the formation of biofilms or colonisation, settlement and recruitment of different bio-species will be planned depending on the response of the novel alloys during their manufacturing using powder metallurgy and thermomechanical processes.

STUDENT TASKS:

1. Formulate the chemical composition of the alloys
2. Prepare the targeted alloys by mixing of the starting raw materials in the form of powders
3. Shaping of the mixed powders into billets by uniaxial pressing
4. Consolidation of the pressed billet via a heat treatment at high temperature (i.e. sintering) to be carry out either by vacuum sintering or induction sintering
5. Post-processing of the sintered billet by means of hot forging
6. Characterisation of the properties of the sintered and forged alloys
7. Analysis and correlation of the results on the base of the behaviour of the alloy with the selected processing route (i.e. parameters)

REQUIRED SKILLS:

1. Knowledge of phase diagrams and materials science and engineering related topics for the formulation of novel materials
2. Good practical abilities
3. Understanding of fabrication processes such as powder metallurgy and thermomechanical processing (i.e. hot forging and hot extrusion)
4. Ability to apply the engineering knowledge acquired to solve possible analytical problems derived by the experimental nature of the project
5. Appropriate communication skills to discuss complex scientific issues

PROJECT ABSTRACT:

Titanium and titanium alloy are regarded as very promising materials for marine industry applications because of their excellent combination of properties such as lightweight, strength and excellent corrosion resistance. Moreover, Ti is widely used in biomedicine because of its biocompatibility; Ti is actually bio-inert and therefore does not react with the human body and in particular with the body fluids.

Nevertheless, like every other metal placed in contact with a marine environment, Ti will at some point be affected by bio- and/or fouling (i.e. the growth and accumulation of microorganisms on wetted surfaces). On the one side, the applicability of Ti in the marine industry is limited by biofouling and, thus, the development of novel anti-biofouling chemical compositions would be beneficial to both increase the use of Ti and increase the efficiency of current products such as propellers. On the other side, the biofouling effect on Ti could be enhanced for its exploitation in the freshwater and/or seawater aquaculture context through the formulation of new alloys.

The aim of this Summer Research Project is to consider the design, manufacture and characterisation of innovative Ti-based materials targeting (anti-)bio/fouling applications in order to assess whether these novel materials with appropriate level of technological and mechanical performances can successfully be attained. The design of the materials will take into account aspects to either prevent or promote biofouling in Ti.

The production of the selected compositions will be carried out via the employment of powder metallurgy and thermomechanical processes where powder metallurgy offers the possibility to obtain porous materials. This could also be proven advantageous to favour the growth of specific aquaculture bio-species. For that two consolidation routes (i.e. the transformation of a powder compact into a solid material) considering different set of processing parameters like temperature and time will be investigated. In terms of characterisation, the technological characteristics will be determined during the production of the materials whilst for the materials characteristics, physical, mechanical and microstructural properties will be quantified.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
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ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	30
Supervisor/s:	Marcus Wilson		
Project Title:	Making a small-scale coil and control system for transcranial magnetic stimulation		
Faculty:	School of Engineering	Field:	electronics, physics, biophysics

EXPECTED OUTCOMES:

If successful, a journal publication in a "Frontiers in Neurosciences" journal. A conference paper for the New Zealand Institute of Physics biennial conference, Dunedin, July 2017. Production of a prototype coil that can be used for research purposes or further developed for research purposes. Further opportunities for international collaboration with University of Western Australia.

STUDENT TASKS:

- Identify key design criteria for the small coils.
- Undertake electromagnetic modelling, both pen-and-paper and using computer models (e.g. COMSOL Multiphysics and Matlab) . He or she will need to be able to identify the strength and time-profiles of electric fields produced as a result of pulses of current in a coil.
- Research power electronics systems that could potentially drive the coils.
- Produce a prototype coil and control system.
- Measure in a lab the field strengths and profiles produced by the coil.

REQUIRED SKILLS:

- Apply electromagnetic laws in practical contexts, such as Faraday's law and the Biot-Savart Law
- Practical use of electronic instrumentation, such as oscilloscopes, spectrum analyzer, Hall probes.
- Design of practical electronic circuits.
- Mathematical ability sufficient to confidently apply vector calculus to electromagnetic fields and solve second-order linear differential equations (e.g. for the impulse response of a circuit).
- Being able to work in an electronics/physics laboratory with hands-off supervision.
- Use of computer models and basic computer programming. We are likely to use COMSOL Multiphysics and Matlab, although explicit experience in these is not required.

PROJECT ABSTRACT:

In Transcranial Magnetic Stimulation (TMS) rapid pulses of magnetic field are applied to the brain, via an external current-carrying coil. Current in the coil will give a magnetic field; the rapid change in this magnetic field when the current rises and falls will give rise to an electric field. It is believed that this electric field, in some way, stimulates neural activity in the brain. The technique has been tried for many neurological conditions such as stroke, Parkinson's disease, tinnitus and depression, to improve patient outcomes.

Although a typical figure-of-eight human TMS coil is large, around 12 cm in length, it can be used effectively to target a small portion of the brain. We would like to be able to produce an equivalent set-up for use with rats and mice. Here we run into a problem, their brains are much smaller than humans, and consequently to localize the electric field over a small portion of the brain requires smaller coils. However, with a small coil it is difficult to provide sufficient current in a sufficiently short time, and the forces between the two parts of a figure-of-eight coil are large. In this project the student will look at the design of small TMS coils, suitable for rodents, with a view to overcoming the difficulties.

We will consider the electronics driving the coils and the strengths and time profile of the electric and magnetic fields they produce, and aim to match them to the output of human coils. A successful outcome would be the design and production of a prototype coil and control system that could potentially be used for research work.

This project will be undertaken in collaboration with the School of Animal Biology at the University of Western Australia.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
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Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	31
Supervisor/s:	Mike Duke & Shen Hin Lim		
Project Title:	Investigation of Soft Grippers for Kiwifruit		
Faculty:	School of Engineering	Field:	Agricultural Engineering

EXPECTED OUTCOMES:

Enough information and data to contribute towards a research publication. Fully operational prototype for kiwifruit harvesting season.

STUDENT TASKS:

13. Evaluate existing gripper and others both commercial and in research publications
14. Identify key criteria for successful gripper
15. Trial different materials and configurations to meet criteria
16. Select best option or combinations for more detailed investigation
17. Manufacture prototypes using CAD and 3D printing of silicone moulds
18. Test and evaluate final soft gripper in relation to criteria
19. Provide data for a research publication

REQUIRED SKILLS:

1. Mechanical engineering
2. Design
3. SolidWorks
4. Laboratory process
5. Manufacturing
6. Word processing, report writing

PROJECT ABSTRACT:

This is part of an MBIE contract to develop hardware for robotic harvesting of kiwifruit. One of the key elements is the soft gripper. The gripper must be robust, fit kiwifruit well, integrate with a harvesting mechanism and not damage the fruit. The research will involve a review of existing gripping methods, choosing the best possible options for kiwifruit, developing prototypes and testing them on both pseudo and real kiwifruit. This will include evaluation of possible fruit damage by trials and observation.

Summer Research 2016/17

Project Abstract



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Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	70
Supervisor/s:	Prof. Kim Pickering & Dr John Kennedy (GNS)		
Project Title:	Surface modification of biomaterials for 3D printing		
Faculty:	FSEN	Field:	Materials and Processes

EXPECTED OUTCOMES:

- The student will carry out a literature search on the surface modification technologies and challenges related to 3D printing of biomaterials. Once the literature survey is completed, the student is expected to design and test at least one proof-of-concept surface modification technology with fibre materials at GNS Science.

STUDENT TASKS:

- Literature review on surface modification technologies
- biomaterial sample preparation at UOW
- Design and data collection at GNS Science, Lower Hutt

REQUIRED SKILLS:

- Engineering
- Materials & Processes

PROJECT ABSTRACT:

3D printing is currently limited to homogeneous properties with different electric, magnetic and mechanical properties (with the exception of colour in polymer 3D printing). However, there is no report in the literature suggesting any method to print an object with varying structural and surface properties to improve the objects behaviour.

Our research will focus on locally changing the surface polymer properties to derive localised functionality (e.g. superhydrophobic/philic, amphiphilic surfaces).

The objective of this project is to investigate the application of surface modification techniques for the modification of biomaterial (e.g. cellulose fibre) surfaces before 3D printing. Various surface modification capabilities available at the National Isotope Centre, GNS Science will be used for this research and the biomaterials will be prepared at Prof. Kim Pickering group, School of Engineering, Faculty of Science and Engineering, University of Waikato.

Summer Research 2016/17

Project Abstract



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WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	32
Supervisor/s:	Megan Balks		
Project Title:	Soils of New Zealand		
Faculty:	School of Science	Field:	Soil Science/Earth Science

EXPECTED OUTCOMES:

1. Glossary for Soils of NZ book prepared and some diagrams drafted.

STUDENT TASKS:

1. Assist, under guidance, in collating the glossary for the book
2. Assist, under guidance, in preparing and collating diagrams and photos for the book
3. Help with other research tasks as required such as fact-checking.

REQUIRED SKILLS:

1. An interest in and enthusiasm for Soil Science.
2. Skills and interest in graphic design
3. Careful thorough worker who enjoys reading and writing work.

PROJECT ABSTRACT:

Dr Balks is currently working with recently retired Landcare Research Scientist, Dr Allan Hewitt, on a book entitled "Soils of New Zealand" which is to be published as part of a series on soils of the world by Springer Publishers.

This will be an important book for New Zealand, the first written using our modern New Zealand soil classification (which was developed by Dr Hewitt) and will provide an important review of New Zealand's soils.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
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Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	33
Supervisor/s:	Michael Mucalo		
Project Title:	How safe is your crockery? a systematic instrumental analysis of modern ceramic glazes by colour in domestic tableware		
Faculty:	School of Science	Field:	Inorganic and Materials Chemistry

EXPECTED OUTCOMES:

We expect to be able to group common colours of commercially available ceramic table ware with certain elements so that we may confidently be able to know what are the common heavy metal elements present in domestic table ware.

We expect the student to become thoroughly well trained in the use of several instrumental techniques, namely X-ray fluorescence, X-ray diffraction, and solid state nuclear magnetic resonance (for bulk analysis)

STUDENT TASKS:

1. Collect representative samples of coloured (red, black, yellow, green, blue, domestic tableware from commercial outlets
2. Chipping off of the glazes, and grinding to produce a fine powder for X-ray Fluorescence Analysis to analyse elements present
3. Perform other instrumental analysis will be performed including X-ray diffraction, Solid State Nuclear Magnetic Resonance and Infrared Spectroscopy.
4. Perform hand held XRF measurements on as received ceramic items and correlate data with that from the more traditional XRF approach of sampling (which involves grinding of samples)
5. Correlation of data from the different methods to ascertain the identity of glaze material (elements contained) and matrix material that the glaze coats are incorporated with
6. Summarise the information in a convenient form such as an excel spreadsheet where colours are clearly correlated with certain elements
7. Write a report in which the trends observed are discussed and conclusions made as to what heavy metals are associated with which coloured glazes

REQUIRED SKILLS:

The student will be:

1. skilled at working in a general Chemistry laboratory
2. aware of safety practices when working in the Chemistry laboratory
3. skilled with preparing samples, collecting data, performing experiments upon instruction and using initiative and using Excel
4. skilled at using instrumentation or being trained to do so.
5. skilled at the broad concepts of inorganic chemistry
6. skilled at writing a research report along the lines of a publication as done in the Chemistry laboratory writeups

PROJECT ABSTRACT:

The domestic New Zealand ceramic tableware market is flooded with relatively cheap, highly coloured ceramics sourced mostly from China and to a far lesser extent from countries like India, South East Asia and Europe. The coloured glazes may often contain heavy metals such as barium, lead, cadmium or chromium among others.

A systematic survey of these very common products in New Zealand is apparently completely lacking because these materials are sourced from a perceived myriad of largely unknown industrial sources in China or other global sources and it is of interest to know what metals exist in these from a safety perspective. It is difficult to predict exactly what heavy metals might be present in any given glaze. This project hence seeks to throw light on what elements are in the coloured glazes using the simple category of colour and correlating these (i.e. red, yellow, green, black, orange and blue) with the elements that are confirmed by instrumental detection in these.

The project will involve the purchase of items of these from well known retailers, the selective removal of glaze followed by grinding and then the analysis by X-ray fluorescence (XRF) of these together with other characterisation techniques such as X-ray diffraction and solid state nuclear magnetic resonance spectroscopy to characterise the solid bulk (unglazed) phase as well as what ceramic phase coexists with the coloured glaze.

In addition, we will also investigate the use of a hand held XRF device to allow quick and non-destructive sampling of the ceramic items. The data will then be collated and correlated to see what the occurrence of specific heavy metals are in the variously coloured glazes and to look for trends or particular combinations of metals associated with each colourway tested. In particular we will also correlate the results from traditional XRF sampling (via grinding) of the specimens with the non-destructive XRF (hand held device) approach to see if reliable information can be provided by this method.

The project will provide some original data on what current heavy metal elements are populating our dinner tables. The X-ray diffraction data of the structural material in the glazes and the bulk will provide some idea of what "matrix" the heavy metals in the glaze are contained within and hence inform of how safe these materials might be against leaching of the potentially harmful heavy metals from the glaze.

The work may inform a protocol that could be developed in time and used in New Zealand to characterise coloured glazes. As such the work could be used as a foundation to apply for funding to develop such a protocol.

Summer Research 2016/17

Project Abstract



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Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	34
Supervisor/s:	Erik Horstman & Karin Bryan; Julia Mullarney		
Project Title:	Quantifying thresholds for sediment dynamics in mangroves		
Faculty:	School of Science	Field:	Coastal Oceanography

EXPECTED OUTCOMES:

We expect the student to contribute significantly to the collection of the above-mentioned data, resulting in a preliminary analysis and conclusion for the correlation of at least one of the relevant biophysical characteristics feeding into the critical bed shear stress of mangrove soils.

These results will be extended to a wider range of parameters and will be complimented with data from previous field campaigns in contrasting field sites. Altogether, this work should result in a scientific publication.

STUDENT TASKS:

1. Data collection in the field
2. Processing soil and water samples in the lab
3. Analysing combined field and lab results
4. Reporting on collected data and analyses

REQUIRED SKILLS:

1. Basic understanding of coastal processes
2. Accurately following field and lab procedures
3. Familiar with the fundamentals of data analysis
4. Eager to learn new skills

PROJECT ABSTRACT:

Mangroves thrive at the interface between land and sea and provide many valuable ecosystem services. For example, mangroves support important ecological habitats, supply food and wood for local communities, filter contaminants from coastal waters, sequester carbon in their anoxic soils and, most of all, they contribute to coastal protection.

To better understand the functioning and maintenance of these ecosystems, we need to know how the sediment dynamics in mangroves work. New Zealand is the perfect playground for such a study, as it is one of the few places around the world where mangroves are expanding.

The sediment dynamics in mangroves depend on the hydrodynamic exposure of the bed and the resistance of the bed material to erosion. Determining the stability of the bed material in mangroves is challenging for multiple reasons: mangrove sediments range from very fine and cohesive muds to rather coarse and looser sandy substrates; mangrove roots tend to keep the soil together; and benthic activity can either stabilize or destabilize the bed. Thresholds to sediment erosion and deposition in mangroves are quantified by the critical bed shear stress. However, little is known about this physical parameter yet.

To improve our understanding of the critical bed shear stress and its correlation with different physical and biological properties, we are collecting and analysing field data from different mangrove sites within New Zealand and across contrasting zones at each of these sites.

Your task is to help us during one of our field campaigns in the Firth of Thames, which is scheduled for a period of 2 weeks in November. We will provide a crash course on field work and research methods to get you all geared up for collecting data on various biophysical parameters in the field. In addition to the biophysical parameters that can directly be observed in the field, we will also be collecting samples that need further analysis in the lab to determine parameters such as sediment grain sizes, root mass and benthic properties. This is a unique opportunity to get familiar with the collection of field data and with sample processing in the lab, skills that many researchers are lacking these days.

Finally, our aim is to correlate the observed critical bed shear stresses to the various biophysical properties that we quantified. As time is limited, you will analyse the correlation between one or two selected properties and the critical bed shear stress. This will allow you to work on your data analysis skills and will enhance your understanding of the dynamics in coastal mangrove ecosystems.

This research will eventually help us to improve the models that are currently being used to predict sediment dynamics in mangroves

Summer Research 2016/17

Project Abstract



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Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	35
Supervisor/s:	Fiona Petchey & Adam Hartland		
Project Title:	Radiocarbon dating marine shell from a hardwater environment.		
Faculty:	School of Science	Field:	Radiocarbon, stable isotopes, archaeology

EXPECTED OUTCOMES:

1. Generate data that will contribute to a Marsden grant.
2. Contribute to a database of Pacific archaeological radiocarbon information.
3. Paper in a peer-reviewed archaeological journal

STUDENT TASKS:

1. Undertake literature search
2. Contribute to a database of Pacific archaeological radiocarbon dates.
3. Sample archaeological specimens for isotope work.
4. Chemically clean shells and test for recrystallisation
5. Measure O18 and 13C isotopes using LGR laser isotope analyser
6. Chemically pretreat shells for 14C analysis
7. Hydrolyse and graphitise shells for 14C analysis

REQUIRED SKILLS:

1. Basic laboratory chemistry skills
2. Care and attention to detail.
3. Good writing skills
4. An interest and basic knowledge of environmental isotopes
5. Ability to work regular hours

PROJECT ABSTRACT:

First human settlement of the Mariana Islands occurred around 3200 years ago. By 2250 years ago sea-levels in this region had dropped by around 1.75m. This led to coastal progradation and the infilling of sheltered embayments preferred by mangroves. It has been speculated these near shore changes resulted in the loss of the quiet intertidal settings preferred by the marine bivalve *Anadara antiquata*, which was a popular prehistoric food source.

The archaeological site of Bapot-1 has evidence of near continuous occupation between 3200 and 1200 years ago. Samples of *Anadara* from the oldest deposits have radiocarbon (^{14}C) values that reflect uptake of ancient carbon from nearby limestone bedrock (termed a hardwater effect whereby bicarbonate ions generated by seepage through calcareous strata become incorporated into the shells of animals living in the water).

This issue has resulted in up to 300 years of offset in the ^{14}C ages of shells dated, and has had a significant impact on the ability to calculate a reliable calendar age for the first human settlement in this region. The limited available dating evidence from deposits at Bapot-1, dated to around 2000 years ago, suggests that the impact of hardwaters had diminished by this time. This has never been fully tested but can be evaluated using a combination of shell ^{18}O and ^{13}C isotopes, prior to more expensive ^{14}C dating, based on the principles that ^{18}O can be used as an indicator of change in water temperature and salinity, while the $\delta^{13}\text{C}$ value predominantly reflects water source and overall marine productivity.

This project aims to see if the same hardwater effect is present in shellfish remains from Bapot-1 dating to around 2000 years ago after sea-levels had stabilized. This will be undertaken by measuring ^{18}O and ^{13}C isotopes in marine shells prior to confirmation by ^{14}C .

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
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Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	38
Supervisor/s:	Kevin Collier & Brendan Hicks		
Project Title:	Food-web analyses in lakes		
Faculty:	School of Science	Field:	Freshwater ecology

EXPECTED OUTCOMES:

Quantitative analysis for fish diet in lakes and data to support development of food web models

STUDENT TASKS:

1. Dissecting fish and removing guts
2. Identifying gut contents microscopically
3. Grinding, drying and weighing samples for isotope analysis
4. Assisting with field work where required
5. Entry of data onto spreadsheets

REQUIRED SKILLS:

1. Willing to undertake detailed microscopic analyses
2. Knowledge of fish and invertebrate identification
3. Willingness to take responsibility and work independently
4. Methodological and structured approach to conducting research
5. Careful attention to detail
6. Prepared to undertake repetitive tasks

PROJECT ABSTRACT:

This project is part of a larger lakes research programme aimed at understanding factors affecting the resilience of lakes to human impacts. Invasive fish in lakes are one factor that can affect lake resilience through their impacts on water quality and the flow of energy through food webs. Analysis of the diet of invasive and native fish that potentially compete for resources in lakes and affect other parts of the food web, such as zooplankton which graze on phytoplankton, is an important component of food web analysis. This project will involve microscopic analysis of gut contents of fish caught from lakes and preparation of samples for stable isotope analysis which helps identify energy flow pathways in food webs.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
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Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	39
Supervisor/s:	Louis Schipper & Aaron Wall		
Project Title:	Soil characterisation of research farm		
Faculty:	School of Science	Field:	Soil Science

EXPECTED OUTCOMES:

Written report on the soil properties on Troughton Farm

STUDENT TASKS:

1. Field work: digging of holes, soil description, collection of soil samples
2. Laboratory analysis: replicated measurements of bulk density, porosity, texture, moisture release curves, C content, N content, P content, and pH from collected soil samples
3. Data analysis and interpretation
4. Report writing
5. As a member of our diverse research group, you will also contribute to weekly group meetings
6. Accompany and assist other group members on field excursions as required

REQUIRED SKILLS:

1. Interest in soil science and earth science in general (completion of EARTH233 , EARTH234, EARTH333 or EARTH334 papers would be an advantage)
2. Good working habits (reliable, self-motivated, and enthusiastic)
3. Methodological, careful worker with good record keeping skills
4. Ability and willingness to learn new techniques
5. Physically fit and able to work and enjoy full days in the field and lab
6. Responsible attitude towards people and equipment

PROJECT ABSTRACT:

Soils in New Zealand generally contain large amounts of carbon, especially those soils used for pastoral agriculture. Farm management practices may be altered in order to protect this soil carbon from loss, or even increase carbon stocks as a way of mitigating climate change and enhancing soil health and production.

Funded by the New Zealand Agricultural Greenhouse Gas Research Centre (<http://www.nzagrc.org.nz/>), our research group is investigating the impact of several management practices on carbon and water cycling on a.

dairy farm near Waharoa. As part of this work, we need to characterise the soils in the experimental paddocks on the farm in detail; the five different soils and their spatial distribution need to be described. Physical soil properties that need quantifying include bulk density, porosity, texture and moisture release curves, while the chemical properties include carbon, nitrogen and phosphorus contents and pH.

If time allows, there are additional questions regarding the spatial variability of soil moisture and soil respiration across the paddocks. We need to know how representative our one-point measurements of soil moisture are for the whole paddock, and how spatially variable soil respiration is

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	40
Supervisor/s:	Adam Hartland		
Project Title:	In situ measurements of metal-ligand dissociation in cave waters		
Faculty:	School of Science	Field:	Geochemistry / Environmental Chemistry

EXPECTED OUTCOMES:

A high impact research paper in ES&T or a similar top journal.

STUDENT TASKS:

1. Prepare DGT gels and assemble DGT probes
2. Carry out experiments with artificial and natural ligands
3. Carry out experimental deployments in caves
4. Help to interpret data and write up methods and results

REQUIRED SKILLS:

1. Analytical chemistry
2. Fieldwork

PROJECT ABSTRACT:

Trace metals are carried by natural organic matter (NOM) into caves by infiltration. We know that these metals are captured by secondary carbonates (speleothems) and that their fluctuations in the carbonate archives relate to both hydrological change and to the NOM characteristics. In order to interpret the trace metal records from speleothems, we must first determine the extent to which metals are released from NOM-metal complexes (dissociate) at the speleothem surface.

In this project the student will help to develop an in situ 'channel probe' for measuring metal dissociation rates in dripping cave waters, and also deploy DGT gels at the surface of stalagmites to map the enrichment of metals in growing stalagmites. This work links into projects examining the aquatic carbon cycle and to palaeoclimatic records from the last 100 kyr funded by the NZ Marsden Fund and the European Commission.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	36
Supervisor/s:	Carolyn King		
Project Title:	Potential underestimation of pest populations by footprint tracking indices		
Faculty:	School of Science	Field:	Pest management

EXPECTED OUTCOMES:

The proportion of animals observed to be hesitant or unwilling to walk across the inkpad, if any, could represent a potential error in the standard method of population indexing. Depending on whether the data collected by this project are sufficient, it might be possible to estimate whether such an error is significant, at least in summer, and if so to suggest a correction factor.

STUDENT TASKS:

1. Review the literature on the use of tracking tunnels over the last 30 years
2. Assist with negotiations for choosing a study area and borrowing equipment
3. Lay out tunnels and cameras in the chosen field area
4. Monitor and maintain tunnels and cameras throughout the field phase of the project
5. Enter the results in Excel and help with their analysis
6. Help write a draft report on the results

REQUIRED SKILLS:

1. Full driving licence and willingness to work independently in the field in all weathers
2. Technologically competent with cameras and field gear, and capable of dealing with setbacks calmly
3. Familiar with Excel and simple non-parametric stats
4. Capable of drawing conclusions from data and writing a draft report

PROJECT ABSTRACT:

Footprint tracking tunnels are the most widely used method of indexing populations of rodents and mustelids. They are simple enough to be used by community groups and professionals alike. A standard figure (% of tunnels tracked) is calculated, both before and after any management action is taken, to determine whether action is needed and if so, to check the results.

The usual basic assumption is that animals entering the tunnel will not be put off by the feeling or the smell of the tracking ink, but will walk across it, pick up ink on their feet and leave footprints on the papers set at either end of the tunnel.

On occasion, cameras set inside tunnels have observed animals apparently avoiding the ink (King, C.M.; McDonald, R.M.; Martin, R.D.; Tempero, G.W.; Holmes, S.J. 2007. Long-term, automated monitoring of the distribution of small carnivores. *Wildlife Research* 34: 140-148. Kelley, C. House mouse (*Mus musculus*) use of vertical space and impact on bird nesting success. MSc thesis, submitted), but the extent and significance of this behaviour are unknown, because tunnels are not routinely monitored by other devices. In one case where they were, significantly fewer rats visited tunnels equipped with (supposedly invisible) infra-red light gates, compared with tunnels set in the same positions with no IR light-gates (Prout 2003, cited by Newbold, H.G.; King, C.M. 2009. Can a predator detect "invisible" light? Infra-red vision in ferrets. *Wildlife Research* 36: 309-318). If such avoidance behaviour happens at any more than a negligible rate, then tracking indices risk underestimating the pest population present. This project aims to quantify that risk.

Summer Research 2016/17

Project Abstract



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Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	41
Supervisor/s:	Toni Cornes		
Project Title:	Ecological Restoration of a Hamilton Gully		
Faculty:	School of Science	Field:	Biology/terrestrial ecology

EXPECTED OUTCOMES:

1. Comprehensive restoration planting plan

STUDENT TASKS:

1. Categorise current vegetation
2. Map key ecological features within the gully
3. Produce a staged planting plan/restoration tool

REQUIRED SKILLS:

1. Some plant identification skills preferred
2. Ability to work in the field preferred
3. Some experience using GPS would be beneficial
4. Some knowledge of GIS systems preferred

PROJECT ABSTRACT:

Hamilton City has an extensive network of gullies. These extend from the Waikato River through many suburbs of the City, occupying around 750 hectares or 8% of the City area. This gully network provides important green space for recreation, visual relief from the urban environment, and habitats for a wide range of indigenous wildlife. Active restoration has been on the rise in Hamilton over the past two decades. Ecological restoration of Seeley's gully, however, has been underway for more than 50 years. This gully was purchased by Dr. Seeley in 1960, and at the time was completely pasture. Doctor Seeley progressively restored the area using a trial-and-error planting approach. As a result, the gully is now predominantly covered by native vegetation.

Seeley's gully was gifted to Hamilton City Council in 2004, and is considered one of Hamilton Cities Key Ecological Sites. Unlike many other planted areas in Hamilton, Seeley's gully has a mature canopy and is at a stage where specialist mid-late successional plant species could be re-introduced. We have an opportunity for a biology/ecology student to work in with Hamilton City Council's management plan for the gully, and the goals of 'Friends of Seeley's Gully' community group, to develop a staged restoration planting plan, with a specific focus on specialist and mid-late successional plant species.

This would involve a moderate amount of fieldwork to survey and map current vegetation within the gully. This information would then be used to produce an Ecological Reconstruction Tool. This tool would divide the gully into topographic zones and the associated vegetation types/planting units. Each planting unit would have a tailored native species list and information on the spacing, timing and quantities of plants required.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	42
Supervisor/s:	David Lowe & James Beattie		
Project Title:	Documenting historical earthquakes and geothermal activity in the central Waikato region to help understand paleoseismicity associated with hidden faults within and near Hamilton		
Faculty:	School of Science	Field:	Earth sciences and environmental history

EXPECTED OUTCOMES:

1. Student will learn to search archives and literature and discern and evaluate key points
2. Student will develop skills to undertake a literature review from disparate sources
3. Manuscript in suitable form for refereed journal (potentially able to be submitted by end of project and ultimately published)

STUDENT TASKS:

1. Review and evaluate a wide range of documents including newspapers and published articles from the scientific and historical literature dating from the 19th century though to the present on historical earthquakes and on geothermal activity in the Hamilton Basin
2. Integrate the data acquired and write a refereed article on the historical earthquake and geothermal activity for a suitable journal such as Journal of the Royal Society of New Zealand

REQUIRED SKILLS:

1. Write with accuracy and clarity
2. Read critically and analytically
3. Search newspapers and make notes
4. Search older literature and make notes based on other primary documents (e.g. Hochstetter's work, Transactions/Proceedings of the NZ Institute)
5. Search for more recent literature using (e.g.) Eiby (1989), Beanland (1996), Downes in Edbrooke (2005), and Persaud et al. (2016) as starting points
6. Analyse and interpret historical material (and potentially pre-European information to be obtained independently) in light of recent geoscientific findings

PROJECT ABSTRACT:

Hamilton's citizens were delivered a bombshell on 1 May, 2015, when a newly-identified geological fault in the city made front-page news. At that time, little was known about it other than it may have moved in the last ~200,000 years'. Since then, dramatic discoveries have revealed a much greater potential threat: at least four hidden faults have now been identified from various lines of evidence, including offsets in exposures, LIDAR topography, geothermal and oil/gas wells, geophysical data, seismic-reflection data, river-based multibeam-echosounder and side-scan data, and paleo-liquefaction structures. Three of the faults occur in Hamilton City, one extending southward being marked by a line of geothermal springs near Temple View. All four intersect with important linear infrastructure including the Waikato Expressway, the main trunk railway, electricity, gas, and communication transmission corridors, and flood defences. Most recently, analyses of 84 cores extracted in the 1980s from 12 shallow lakes formed ~20,000 years ago in the Hamilton Basin have revealed that three volcanic ash (tephra) layers preserved in organic-bearing lake sediment have been liquefied in some (but not all) lakes by pre-historic seismic events (earthquakes), forming what we term 'tephra seismites'. Ages on these tephra seismites indicate that liquefaction-inducing shaking occurred soon after 15,500 years ago, 14,000 years ago, and 8,000 years ago. Thus there is now strong evidence that one or more of the hidden faults in the Hamilton area may have moved three times within the past 20,000 years. Reaction to the news last year resulted in a newspaper correspondent claiming (erroneously) that Hamilton is outside the active zone of shallow and deep earthquakes' and hence there is little to worry about. The new faults and likely recent activity demonstrably show that this view is no longer tenable. Helpfully, the correspondent reported that the Waikato region has experienced several damaging earthquakes in historical times. Consequently, to provide background to the evolving geoscience-based research being undertaken on the new faults, liquefaction, and tephra seismites, we plan to undertake a summer project that aims to compile and document all recorded historical earthquake and geothermal activity in the Waikato region with a focus on the Hamilton Basin area, and to then write a refereed paper on the findings. Some reports on earthquakes and geothermal springs are available but these and other articles are of limited scope and disparate and hence we plan two objectives to meet the aim: (1) to review and evaluate documents including newspapers and published articles from scientific and historical literature dating from the 19th century through to the present on earthquakes and hot-springs; (2) to write an article about the historical earthquake and geothermal activity for a suitable refereed journal (e.g. Journal of the Royal Society of NZ). This article could include an attempt to place the historical data in the context of the new Hamilton faults and also that of the Kerepehi Fault, which occupies the adjacent Hauraki-Matamata lowlands.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	43
Supervisor/s:	Jo Lane		
Project Title:	Determining the strength of hydrogen bonding: An automated approach		
Faculty:	School of Science	Field:	Computer science / computational chemistry

EXPECTED OUTCOMES:

Production of a semi-automated computer programme that can determine the integrated volume of discrete regions of kinetic energy density. This work will be published in the Journal of Chemical Theory and Computation.

STUDENT TASKS:

1. Develop a semi-automated computer programme to determine the integrated volume of discrete regions of the kinetic energy density
2. Benchmark the results of the programme against results obtained manually
3. Write simple documentation for use of the computer programme

REQUIRED SKILLS:

1. Ability to write code using one of the common programming languages: Fortran 90, C++, Python, etc
2. Ability to read/interpret Fortran 90 code
3. Ability to write concise documentation explaining how to run the programme

PROJECT ABSTRACT:

Hydrogen bonding is an ubiquitous long-range interaction that is important in a diverse range of applications, including solvation, self-assembly of macromolecules, ligand-substrate binding and protein folding. There are several theoretical approaches available to determine the strength of intermolecular hydrogen bonds (between two molecules) but none that can be reliably used to determine the strength of intramolecular hydrogen bonds (within a single molecule).

Recently, we have shown that the integrated volume of the kinetic energy density correlates very well with the strength of both intermolecular and intramolecular hydrogen bonds. However, the process for evaluating the volume is laborious, requiring considerable user input.

The purpose of this Summer Research Scholarship is to develop a computer programme that automatically identifies and characterises the strength of hydrogen bonds based on discrete regions of kinetic energy density.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	44
Supervisor/s:	Jo Lane		
Project Title:	Making computational chemistry more accessible		
Faculty:	School of Science	Field:	Computer science / computational chemistry

EXPECTED OUTCOMES:

A modified version of IQmol that is able to write input and read output files for the ORCA computational chemistry programme. This contribution will also be made available as a branch on Github. The modified version of IQmol will be extensively used by research students in the School of Science.

STUDENT TASKS:

1. Add a new module to IQmol to allow ORCA input files to be written
2. Add a new module to IQmol to allow ORCA output files to be read in
3. Write a short introductory tutorial about running Orca jobs using IQmol

REQUIRED SKILLS:

1. Ability to write code using C/C++
2. Familiarity with the Qt libraries

PROJECT ABSTRACT:

Computational chemistry is one of the fastest growing research areas in chemistry. While there are a number of excellent opensource computational chemistry packages, most of these do not have a quality graphical user interface (GUI), which limits their mainstream use. One such programme is ORCA, which is fast and offers a wide range of theoretical methods but does not have an appropriate GUI. IQmol is a high quality opensource GUI that has been developed for QChem, a commercial computational chemistry package.

The purpose of this Summer Research Scholarship is to add a new module to IQmol to allow it to interface with the ORCA. This will have immediate benefit to graduate and undergraduate research students at the University of Waikato and will also be made available to others as a branch on Github.

The primary objective of this work therefore is to make computational chemistry more accessible to a wider range of researchers.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	45
Supervisor/s:	Grant Tempero & Brendan Hicks		
Project Title:	Ecological responses to invasive fish control in a Waikato lake		
Faculty:	School of Science	Field:	Fish ecology and limnology

EXPECTED OUTCOMES:

1. Published contract report and associated journal publication

STUDENT TASKS:

1. Assist with fish mark-recapture
2. Setting and clearing fyke nets
3. Boat electrofishing
4. Water sampling
5. Analysis of water samples
6. Assist with sample processing for food-web study
7. Data entry

REQUIRED SKILLS:

1. Ability to work in field and laboratory
2. Attention to detail
3. Flexible work schedule and ability to adapt to a diverse range of projects

PROJECT ABSTRACT:

Lake Ecosystem Restoration New Zealand (LERNZ) is a research group based in the University of Waikato's School of Science with a research focus aimed at restoring New Zealand's freshwater ecosystems. Over the past 10-years LERNZ has conducted a number of studies focusing on the control and eradication of invasive fish species in the North Island of New Zealand. A notable achievement of this programme was the reduction of invasive fish in Lake Ohinewai (principally koi carp *Cyprinus carpio*) from 374 kg/ha to 10 kg. This reduction was achieved using a combination of innovative passive and active removal methods, including a one-way gate and boat electrofishing.

A follow-up study will be conducted during the summer of 2016-17 to determine if the Lake Ohinewai invasive fish population remains suppressed or if changes in the community structure have occurred since the last monitoring study in 2014. In particular, the koi carp population will be assessed to determine if it has increased due to successful spawning recruitment or remains low. The study will also determine whether other invasive species have replaced the koi carp biomass following removal efforts.

Other possible gains are increases in native fish condition due to reduced competition, improvements in lake water quality and increased biodiversity following invasive species removal. This research is an important step in determining the value of invasive fish species control as there are few New Zealand studies examining the ecological effects of invasive fish species control. This project will include a mark-recapture study of native and invasive fish species in Lake Ohinewai using a combination of netting and boat electrofishing.

Water quality monitoring will include weekly measurements of turbidity, suspended solids, and concentrations of nutrients and chlorophyll *a*. Visual assessments of submerged aquatic vegetation regeneration will also be conducted. In addition, this project will also support concurrent projects examining lake food-webs and fish nutrient excretion experiments.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	46
Supervisor/s:	Moritz Lehmann		
Project Title:	Remote sensing data of water quality in Waikato lakes: Ground truthing campaign		
Faculty:	School of Science	Field:	Remote sensing, limnology, lake water quality, field work

EXPECTED OUTCOMES:

The student's work will be very valuable in gathering experience with a new instrument and developing methodologies for deployment and frameworks for data handling. The scientific outcome of the student's work is expected to be the first bio-optical data set for lakes in New Zealand. This will provide a promising opportunity to publish the work in report form to the Waikato Regional Council. Furthermore, the data will feed directly into an ongoing multi-institutional, NZ-wide project funded by the Ministry for Business and Innovation.

STUDENT TASKS:

1. Become familiar with hydrologic optics and instrumentation to measure light;
2. Develop a mounting frame or sensor platform for the instrument
3. Plan and carry out field deployments
4. Processing sensor data and reporting

REQUIRED SKILLS:

1. General understanding of spectral irradiance in the environment
2. Knowledge of water quality parameters and aquatic biology
3. Field experience and willingness to travel in the region
4. Basic understanding of statistical concepts such as mean, variance, correlation and regression
5. Experience in data processing using Matlab, R or other technical software
6. Ability to communicate and collaborate

PROJECT ABSTRACT:

Remotely sensed data from a number of satellite-borne sensors is freely available for download by anyone. Some of this data can be used to derive parameters describing water quality of surface waters such as chlorophyll concentration, suspended sediments and colored dissolved organic matter. While the low cost and extensive spatial coverage of this data offer a tremendous opportunity for environmental monitoring, uncertainties exist in the accuracy of the water quality parameters.

Particularly in lakes, these uncertainties are due to a lack of observations from the ground to calibrate satellite data. This project is aimed at filling some of these gaps by collecting water quality data and making measurements with a hyperspectral radiometer (light sensor). The student will become familiar with the concept of hydrologic optics and learn to use a science-grade radiometer.

In collaboration with the supervisor and a PostDoc, the student will plan and carry out field trips to a number of lakes in the Waikato region to coincide with overpasses of satellites and take simultaneous measurements on site. The specific challenge of this project lies in developing a suitable protocol for the deployment of the radiometer, the handling of complicated field equipment and the post-processing of large volumes of sensor data.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	37
Supervisor/s:	Nicholas Ling & Steve Bird		
Project Title:	Molecular characterisation of New Zealand's carp		
Faculty:	School of Science	Field:	Biology

EXPECTED OUTCOMES:

1. A peer reviewed publication (probably as a short communication) targeting the New Zealand Journal of Marine and Freshwater Research.
2. A conference presentation at the NZ Freshwater Sciences Society annual conference in 2017.

STUDENT TASKS:

5. Undertake collections of NZ common carp from several localities
6. Extract genetic material from collected fish - blood or tissue
7. Develop and characterise DNA primers targeting one mitochondrial and two nuclear genes
8. Amplify, clone and sequence amplified gene products
9. Undertake phylogenetic analysis by comparing sequenced gene products with published genetic data from the carp genome

REQUIRED SKILLS:

1. Ability to undertake field work
2. Ability to work independently and precisely
3. Experience in basic molecular biology skills including DNA extraction and amplification

PROJECT ABSTRACT:

Carp are an unwanted aquatic pest in New Zealand that cause major damage to lakes and rivers contributing to deteriorating water quality and significant economic costs. One of the few possible eradication tools is the koi herpes virus which is being investigated for control of common carp in Australia. However, virulence of this virus varies between different strains of common carp and its possible use for carp control in New Zealand requires that the genetic strain of carp here is characterised. NZ carp has traditionally been referred to as koi, however, recent publications on carp genetics including sequencing of the carp genome indicates that NZ carp may possibly be a Chinese strain called Oujiang carp and not koi.

This project will definitely characterise the genetic strain of NZ carp.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	47
Supervisor/s:	Moritz Lehmann & Mat Allan		
Project Title:	How many lakes can we see from space? Visibility analysis for remote sensing applications		
Faculty:	School of Science	Field:	Remote sensing, limnology, lake water quality

EXPECTED OUTCOMES:

The student will gain an understanding of the process involved in the remote sensing of surface water quality. The scientific outcome of the student's work is a lake-by-lake statistic of remote 'observability' at the national scale and will therefore contribute to an analysis of feasibility of using remote sensing as a routine monitoring tool. In addition, the work will contribute to the estimate of the time series of total suspended matter for all visible NZ lakes. This provides a promising opportunity to publish results in the form of posters or reports. Furthermore, the data will feed directly into an ongoing multi-institutional, NZ-wide project funded by the Ministry for Business and Innovation.

STUDENT TASKS:

10. Briefly review the relevant literature specifically relating to national scale remote sensing;
11. Identify and download Landsat 7 and 8 images;
12. Preprocessing sensor data and reporting on locations and numbers of images downloaded
13. Report preparation

REQUIRED SKILLS:

1. Knowledge of Geographical Information Systems (GIS);
2. Basic understanding of statistical concepts such as mean, variance, correlation and regression;
3. Experience in data processing using IDL, Matlab, R or other technical software;
4. Ability to communicate and collaborate.

PROJECT ABSTRACT:

Remotely sensed data from a number of satellite-borne sensors is freely available for download by anyone. Some of this data can be used to derive parameters describing water quality of surface waters such as chlorophyll concentration, suspended sediments and colored dissolved organic matter. The low cost and extensive spatial coverage of this data offer a tremendous opportunity for environmental monitoring of lakes at the national scale. One major constraint for remote sensing is the fact that many lakes are hard to see from space because they are small and often obscured by clouds.

This project is aimed at determining how often any given lake in NZ can be seen through the clouds by a particular satellite. In collaboration with the supervisors and a PostDoc, the student will update our archive of Landsat 7 and 8 imagery and carry out a series of image processing routines to derive important characteristics for each lake, such as the time series of total suspended solids and the number of cloud-free days.

The specific challenge of this project lies in developing a suitable protocol for effective download and cataloguing of imagery and to apply advanced image processing techniques.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	48
Supervisor/s:	Chris Battershill & Marnie Campbell		
Project Title:	Stingray habitat use: Do different species use different areas?		
Faculty:	School of Science	Field:	Marine Ecology

EXPECTED OUTCOMES:

A scientific report will be written that describes the remote video project and the key findings. The report will place the findings into a context that is relevant to Regional Councils. A power point presentation that summarises the project and the outcomes, and place the findings into a regional council context, will be created and presented to iwi and the relevant regional environmental management/conservation agencies and stakeholders. Potentially (depending on the data robustness and quality) a peer reviewed publication will be jointly written with a Postgraduate (PhD) student and staff.

STUDENT TASKS:

1. Collect un-baited underwater video footage at each of the study sites comprising a variety of habitat types within Tauranga harbour.
2. Conduct video-analysis to quantify ray species presence in each of the habitat types.
3. Identify any feeding behaviour in the video footage collected, assess other fish species presence/abundance.
4. Participate in data-analysis to examine differences in species presence
5. Participate in writing scientific publications on the findings of the research (dependent upon student skill)
6. Present their findings to future potential funding agencies as well as iwi and regional stakeholders
7. Participate in other data collection for the wider stingray project. This may include participation in ray feeding pit surveys and/or stingray tagging exercises.

REQUIRED SKILLS:

1. Statistical skills
2. Coastal field sampling experience and a thorough understanding of working in a tidal environment
3. A knowledge of elasmobranch species especially New Zealand species would be of advantage
4. Ability to work in a team
5. Computer skills
6. Experience with video editing software (desirable, not essential as training will be given)

PROJECT ABSTRACT:

The knowledge of animal movement, spatial behaviour, migration patterns and habitat use is increasingly acknowledged as essential to the effective conservation and management of our environment (Hammerschlag et al. 2011, Block et al. 2011). Identification of vital habitats (habitats essential to different phases of an animals life history), their connectivity, and how species use these habitats or are influenced by anthropogenic activities, is fundamental to ascertaining the true vulnerability of species and ecosystems to anthropogenic impacts (Hammerschlag et al. 2011).

Species that spend some or all of their life history in coastal or estuarine environments are under particular pressure from human interference either directly or indirectly. This may come from direct or indirect (eg noise) interactions with human activities. Pressures from fisheries, habitat degradation, urban and agricultural contaminant run-off (Halpern et al. 2008, Dulvy et al. 2014), climate change (Chin et al. 2010) and possible behavioural alterations due to interactions with humans (Corcoran et al. 2013) are cited. In New Zealand coastal and estuarine systems, there are three species of myliobatiform elasmobranchs (rays), the eagle ray (*Myliobatus tenuicaudatus*), the long tailed stingray (*Dasyatis thetidis*) and the short tail stingray (*Dasyatis brevicaudata*) (Francis 2012). These species use a variety of habitats to forage, with unknown habitat use preferences for breeding and nursery stages of life histories. As these species are thought to utilise similar foraging and feeding strategies (Howard et al. 1977, Gregory et al. 1979, Hines et al. 1997), it is likely that a degree of resource and/or habitat partitioning occurs due to interspecies competition (White et al. 2004, Marshall et al 2008). Selective habitat use has implications for species and habitat conservation (White et al. 2004).

The aim of the project is to carry out a component of research that will support the identification of batoid species' use of different intertidal habitats and to identify any indication of habitat partitioning. Thus, the research questions are as follows: Which mylobatid elasmobranch (ray) species are using different habitats within the Tauranga Harbour/Firth of Thames systems? Is there any evidence of habitat partitioning? It is envisaged that study locations will correspond with locations identified for a larger project quantifying ray feeding excavations in different habitats within the Tauranga Harbour and Firth of Thames systems, and will thus share operational costs with this project.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	50
Supervisor/s:	Brendan Hicks & Kevin Collier		
Project Title:	Nutrient excretion rates of native fish		
Faculty:	School of Science	Field:	Freshwater ecology

EXPECTED OUTCOMES:

The project will produce relationships between nutrient excretion rate and biomass for smelt and bullies. This information will be linked to lake water quality models to predict the effects of fish in lakes.

STUDENT TASKS:

1. Prepare equipment for and participate in field collection of fish for experimental studies from sites in the lower Waikato catchment.
2. Prepare the laboratory set-up and conduct for nutrient excretion experiments following the method of Morgan & Hicks (2013).
3. Liaise with staff operating the nutrient analyser to deliver nutrient samples ready for analysis.
4. Measure fish biomass after completion of the experiment
5. Maintain spreadsheets and graphs of results as the experiments progress
6. Prepare a brief report on the results
7. Contribute a poster to the concluding session of the Waikato Summer Scholarships.

REQUIRED SKILLS:

1. Familiarity with the nets for collecting fish
2. Forward-thinking and highly organised with ability to plan and prepare for field work and laboratory experiments
3. Systematic and able to repeat multiple experiments in the same way on multiple occasions with a high level of care
4. Able to humanely euthanise fish at the end of the experiment
5. A basic understanding of chemical species of nitrogen and phosphorus and their stoichiometry in living tissue

PROJECT ABSTRACT:

Knowledge of nutrient excretion rates of fish and invertebrates are important components of models that can predict the ecological health of lakes and rivers. Fish such as koi carp have high excretion rates of dissolved nutrients that may lead to algal blooms in lakes.

In particular, high nutrient levels have been associated the production of harmful cyanobacterial toxins which can be lethal to some mammals. Following our successful work on koi carp (Morgan and Hicks 2013) we have measured excretion rates from rudd, goldfish, brown bullhead catfish, and shortfin eels (Lockley et al. 2015) and we wish expand this work to common smelt and common bullies, which are widespread and important native fish species. This information will be linked to lake water quality models so that effects of invasive fish relative to native fish on lake nutrient budgets can be predicted. The project will involve collecting a range of sizes of smelt and bullies from the lower Waikato (about 20 fish per species), and returning them to the University fish lab where nutrient excretion rates will be measured, following the method of Morgan and Hicks (2013).

Fish will be held in experimental containers and water samples taken over varying periods up to 5 hours for measurement of nitrogen and phosphorus concentrations. Fish will be euthanised following the experiment according to Animal Ethics protocols, and biomass will be measured. The work is being conducted as part of the Lake Ecosystem Restoration New Zealand (LERNZ) research programme (<http://www.lernz.co.nz/>).
References: Morgan, D.K.J. and B.J. Hicks. 2013. A metabolic theory of ecology applied to temperature and mass-dependence of N and P excretion by common carp. *Hydrobiologia* 705 (1): 135-145. Lockley A, Hicks BJ, Ram R. 2015.

Nutrient excretion by exotic and native New Zealand fish. Poster presentation to the Waikato Summer Scholarships Concluding conference, University of Waikato, Hamilton.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	49
Supervisor/s:	Shaun Barker		
Project Title:	Improving models of geothermal systems using portable XRF		
Faculty:	School of Science	Field:	Geochemistry, geothermal energy

EXPECTED OUTCOMES:

Peer reviewed paper on geochemical models of geothermal systems

STUDENT TASKS:

1. Analyse rock cuttings using portable XRF and collate this data into a single database
2. Prepare samples for analysis using a crushing mill
3. Utilise laboratory XRF
4. Model geochemical data in 3D using loGAS and Leapfrog software

REQUIRED SKILLS:

1. Interest in geochemistry
2. Experience with MS Excel
3. Careful and conscientious about following laboratory procedures
4. Interest in geothermal energy and interacting with industry partners

PROJECT ABSTRACT:

Models of heat and fluid transfer within geothermal systems require accurate geological models. However, determining the identify of hydrothermally altered rocks from drill cuttings deep in the Earth using visual logging is very difficult. In this project, the student will analyze a series of samples from an active geothermal system in the Taupo Volcanic Zone. In collaboration with Mighty River Power geologists and geochemists, we will analyze the chemical composition of rock cuttings from several hundred samples from several geothermal drill holes using portable and laboratory XRF methods. The geochemical results will then be assessed using loGas and Leapfrog software packages to model the data in three dimensions, in order to link distinct lithological units between drill holes, and improve the geology model of the geothermal system. The student will learn about the geothermal industry, geochemical analysis techniques, and 3D geology modelling, while interacting with scientists from the geothermal power industry. The student may spend 2 weeks working out of Rotorua during the project, with accommodation provided.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	52
Supervisor/s:	Chad Hewitt & Marnie Campbell		
Project Title:	Determining the risk of offshore transfer of non-native marine species		
Faculty:	ERI	Field:	Marine Ecology

EXPECTED OUTCOMES:

1. Report of the primary results;
2. an excel dataset of non-indigenous marine species latitude and depth distributions by biogeographic region;
3. preliminary draft risk assessment of offshore transfer of coastal non-indigenous marine species

STUDENT TASKS:

1. Undertake a systematic literature review of global distribution of non-indigenous marine species in deep and offshore waters
2. Compile depth distributions of known non-indigenous marine species from primary literature and global datasets (eg GBIF)
3. Identify non-indigenous marine species that have the ability to expand into deep and offshore waters
4. Undertake a risk assessment of non-indigenous marine species in deep and offshore waters
5. Write a report that describes the current and potential risks of non-indigenous marine species expansion

REQUIRED SKILLS:

1. Basic understanding of marine biodiversity and ecology
2. Competency at designing and implementing a literature review
3. Basic experience with Excel
4. Competency at report writing

PROJECT ABSTRACT:

Over the last decades, human activities have resulted in the introduction and establishment of non-indigenous marine species (NIMS) in the coastal waters of all of the world's oceans, with recent incidences of NIMS in deeper and offshore pelagic waters.

The human-mediated mechanisms of transfer of NIMS into deep and offshore waters include (i) natural dispersal from initial points of introduction, (ii) the accidental transfer associated with fishing activities, aquaculture gear, and offshore deep-water platforms (iii) intentional releases into offshore waters, (iv) the intentional and accidental sinking of vessels with biofouling, and (v) through the offshore discharge of ballast water.

Initial evaluations of the literature indicate that all continents and many islands across the globe have examples of coastal NIMS that have moved into deep (>50m) and offshore (>200km) waters. This project will undertake two literature-based analyses: 1) a global synthetic review of the current extent of deep and offshore water invasions; and 2) an examination of the latent risk posed by known coastal NIMS based on individual species' native depth distributions. The expansion of NIMS into deep and offshore waters will significantly alter our understanding of their potential impacts on environmental and economic values. In addition, the abilities of these species to survive in deep waters provides an indication of their ability to expand into higher latitudes, particularly in response to ocean warming.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	54
Supervisor/s:	Chad Hewitt & Marnie Campbell		
Project Title:	Human facilitation of natural dispersal contributing to range shifts of native species		
Faculty:	ERI	Field:	Marine Ecology

EXPECTED OUTCOMES:

1. Report of the primary results;
2. an excel dataset;

STUDENT TASKS:

1. Undertake a systematic literature review of marine larval dispersal, marine population connectivity and climate change range shifts of marine species
2. Compile species lists from the literature identified in Task 1 and assess relevant connectivity metrics
3. Analyse the relationship between species identified in Task 2 and recognised non-indigenous marine species
4. Undertake a meta-analysis of connectivity and range shifts for species with invasion history and/or association with human mediated transport
5. Write a report of review and analysis outcomes

REQUIRED SKILLS:

1. Basic understanding of marine biodiversity and ecology
2. Competency at designing and implementing a literature review
3. Basic experience with Excel
4. Competency at report writing

PROJECT ABSTRACT:

There is now substantive evidence elucidating the fingerprint of climate change on species' distributions with effects across a broad spectrum of ecosystems, taxonomic groups and biological responses. In virtually all assessments of range shift, attention has been restricted to the natural mechanisms of dispersal response, despite overwhelming and complimentary evidence from the fields of invasion ecology and biosecurity management.

These fields have provided insights to the abundance of human-mediated transport vectors that assist long distance shifts of species resulting in biological introductions, however we note that these same vectors operate at local and regional scales.

This project will consider the role of human mediated dispersal in the understanding of marine connectivity for native populations including the response of marine species to Climate Change associated range shifts. Initially this will entail evaluation of the literature of 1) larval dispersal and population connectivity and 2) Climate Change range shifts, to determine the extent to which human mediated transport has been considered. In reviewing the literature, species records will be developed and compared against species with known invasion histories, or that have been detected in association with human mediated transport mechanisms (eg hull fouling, ballast water) to determine if connectivity and range shifts are more likely to be observed for species with human mediated transport associations.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	53
Supervisor/s:	Christopher Dada & Theodore Kpodonu, David Hamilton		
Project Title:	Turbidity, Suspended Solids, Particulate Inorganic Phosphorus and E.coli Relationships in Recreational Water		
Faculty:	ERI	Field:	Environmental Science (Monitoring)

EXPECTED OUTCOMES:

Upon completion of the study, it is expected that findings would have successfully elucidated relationships between identified variables (turbidity, suspended solids, particulate inorganic phosphorus) and E.coli concentrations and how these relationships change along varying land use gradients. These would inform the development of empirical equations which would be incorporated into the biological indicator module of the DYRESM-CAEDYM lake model, potentially providing a powerful decision support tool for the development of policies for catchment faecal pollution management, as well as providing a management support tool for timelier issuance of swimming advisories. This project will support concurrent projects applying time-series models to evaluate impacts of variability in contaminant delivery in water bodies (e.g. Critical Step 1.1.1, MBIE PROP-43218-ETR-UOW, Enhancing the health and resilience of New Zealand).

STUDENT TASKS:

1. Shore-based water sample collection
2. Basic, data recording from hand-held water quality meter (assistance would be provided)
3. Pearson correlation analysis (optional, assistance could be provided)

REQUIRED SKILLS:

1. Ability to travel to site for sample collection
2. Ability to conduct Pearson correlation analysis (optional, assistance could be provided)

PROJECT ABSTRACT:

Globally, surface waters are susceptible to microbial contamination and can serve as vehicle for transmission of microbial pathogens. Risk of exposure to pathogens in recreational water is often assessed based on concentrations of E.coli, a bacterial indicator of faecal contamination. This assessment is based on conventional tests usually associated with a delivery time of at least 48h, before the results can inform swimming advisory decisions. Faecal indicator bacteria (FIB) levels, however fluctuate over much shorter time-frames. As such, water quality advisories do not present accurate assessments of health risk associated with contact recreation.

The use of water quality models that predict E. coli concentrations at catchment-impacted beaches can revolutionize the timeliness and accuracy of swimming advisories by providing reliable real-time FIB and pathogen forecasts in recreational beaches. The efficacy of these models would however, depend on the successful identification of surrogates that are easy to measure. While key variables such as total suspended solids (TSS), particulate inorganic phosphorus (PIP) and turbidity could be potentially valuable surrogates in water quality models that predict E.coli models, relationships between microbial concentrations and these variables tend to vary in different water bodies and land use.

As part of efforts to develop predictive E.coli models for recreational lakes in New Zealand, this funded study aims to understand relationships between turbidity, PIP, TSS, and E.coli concentrations at Kaituna River and Maketu Estuary. Over the summer months, the student will collect shore-based water samples from recreational sites with varying land use. Water quality monitoring will include weekly measurements of turbidity, suspended solids, particulate inorganic phosphorus and E.coli concentrations in water samples. Visual assessments of potential sources of faecal contamination in the sampling site will also be conducted. Using a combination of correlation and spatial analyses, the student will evaluate relationships between these key variables and how these relationships change along urban and rural gradients.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	51
Supervisor/s:	Marnie Campbell & Pip Wallace		
Project Title:	Contested air space: birds and remotely piloted aircraft (drone) interactions		
Faculty:	ERI	Field: Conservation, bird behaviour, wildlife management	

EXPECTED OUTCOMES:

1. A report on the effects drones have on birdlife.
2. Potential a draft publication.
3. Development of a network of people interested in birdlife protection

STUDENT TASKS:

1. Participate in field research at multiple beaches in the Waikato and potentially the Taranaki regions
2. Be familiar with (via training provided by the supervisors) and follow all animal ethics guidelines and approvals
3. Use a spotting scoping and range finder to observe bird behaviours/reactions
4. Record field data
5. Enter field data in appropriate spreadsheets and statistical packages
6. Participate in analysing data to evaluate trends in bird behaviour/reactions when approached by drones
7. With supervisors aid, interpret data to help determine the influence of drones on bird behaviours/reactions

REQUIRED SKILLS:

1. A passion for coastal conservation
2. An interest in bird behaviour
3. Statistics
4. Ability to travel to field sites
5. Ability to work in a team
6. Coastal field sampling (bird watching)

PROJECT ABSTRACT:

Remotely piloted aircraft (i.e., drones) are thought to be a tool that will revolutionise ecology due to their ability to collect fine scale, high resolution data (Jones et al 2006; Anderson et al 2013) and the opportunity to access previously inaccessible locations (Junda et al 2015). Drones are gaining popularity with researchers but also with scientists (e.g., Jones et al 2006; Junda et al 2015).

However, drones may also be a menace to some species, such as shorebirds that may see drones as predators. This is a particular problem in areas where drones may be more commonly used, such as beaches. The influence of drones on three bird species (mallards, wild flamingos and common greenshanks) has been investigated in France (Vas et al 2015) but no such research has occurred in New Zealand to date. Human disturbance of wildlife interactions via disturbance is an area of interest to researchers, planners and has regulatory relevance to improving conservation in New Zealand (Wallace 2016).

Given the increasing popularity of drone activities and the need to protect New Zealand shorebirds, this study will be a pilot investigation to examine how drones affect shorebird behaviours. Specifically, this project will help investigate: The angle of approach flight influences shorebird behaviour, specifically we will look at the difference between: Oblique approach, Vertical approach, Launch distance; and Speed of drone flight.

The Taranaki Regional Council has indicated that they will provide in-kind support for this research. This research will have animal ethics approval. The student will work with drone operators to observe bird behaviours/reactions.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
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Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	55
Supervisor/s:	Phil Ross & Willem de Lange		
Project Title:	Toheroa life history bottlenecks: examining the relationship between swash riding, wave climate and mass mortality events.		
Faculty:	ERI	Field:	Marine Ecology

EXPECTED OUTCOMES:

1. Research publication
2. Coverage in media

STUDENT TASKS:

1. Carry out fieldwork at toheroa beaches in northern New Zealand
2. Conduct Toheroa population surveys
3. Use GPS to track bed migration over time
4. Collate and analyse climate records
5. Measure a range of environmental variables (physical, biological and chemical)
6. Work with local kaitiaki
7. Provide a written summary of research activities at the conclusion of the project

REQUIRED SKILLS:

1. Physically fit to conduct fieldwork
2. Good people skills
3. Able to use GPS and water quality meters (or willing to learn)
4. Experience conducting environmental or biological surveys would be beneficial

PROJECT ABSTRACT:

The toheroa (*Paphies ventricosa*) is a large intertidal surf clam that was formerly found at high densities on some of New Zealand's west coast surf beaches. Toheroa was an important cultural fishery and subsistence food source for Maori in the regions where this taonga (treasured) species occurred.

In the early to mid-20th century both recreational and commercial harvesting of toheroa intensified and populations declined to levels where harvesting was no longer viable.

The fishery was finally closed during the 1970s. Despite toheroa having now been protected for over 40 years most populations have not recovered and some continue to decline. The failure of toheroa to recover is not something that was anticipated nor would it be expected in a typical marine organism. The mechanisms preventing the recovery of toheroa are unknown. A number of possible factors have been identified, including food availability, climate and weather, sediment instability, toxic algal blooms, predation, harvesting, vehicle impacts and changes in sand dune vegetation and adjacent land use.

To date, the contribution of each of these factors to toheroa population dynamics and the current state of the fishery remains unknown and largely untested. Researchers from our labs have recently begun the process of examining the ecology of toheroa with the purpose of identifying life history bottlenecks, understanding of present-day toheroa population dynamics and informing toheroa management and restoration.

Over the summer of 2016/2017 an MSc student will be conducting research to address the hypothesis that changes in sand dune vegetation and land use have altered the biological and physical characteristics of beach sediments reducing the availability of habitat suitable for toheroa. The summer student associated with this project will have two roles. First, to assist with the MSc research, and second, to conduct research to examine spatio-temporal movement patterns of toheroa beds.

Through recent discussions with kaitiaki from northland iwi and hapu, we have identified interactions between tide and wave associated toheroa migration (swash riding) and a changing wind and wave climate as potential contributors to recorded toheroa mass mortality events. This research will examine this phenomenon.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
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Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	56
Supervisor/s:	Phil Ross & James Crampton		
Project Title:	Testing the use of shell morphometry as a tool for examining the toheroa translocation hypothesis.		
Faculty:	ERI	Field:	Marine ecology and archaeology

EXPECTED OUTCOMES:

1. Conference presentation
2. Research publication depending on outcomes

STUDENT TASKS:

1. Conduct laboratory analyses of shell morphometry at GNS in Lower Hutt
2. Assist with toheroa survey work in northern New Zealand
3. Produce a written summary of research activities at the conclusion of the project

REQUIRED SKILLS:

1. Good computer skills - experience with image analysis software would be beneficial.
2. Physically fit to conduct fieldwork
3. Good people skills
4. Experience conducting biological survey work or analyses would be beneficial

PROJECT ABSTRACT:

The impacts of modern human society on marine ecosystems are both significant and well understood. In contrast, the impacts of early humans are virtually unknown. New Zealand, the last major landmass settled by humans, provides an unparalleled opportunity to determine the significance of early human-ecosystem interactions. Māori settled New Zealand as late as the 14th century, meaning that evidence of early-human impacts are less obscured by time in New Zealand than in countries with more prolonged occupation.

Genetic analyses (supplemented with Māori environmental knowledge) of toheroa (*Paphies ventricosa*), an endemic shellfish of cultural importance to Māori, has led us to hypothesise that the present-day distribution of this taonga (treasured) species is strongly influenced by both historical and contemporary, human-mediated translocations. This hypothesis is currently being tested through a multidisciplinary research programme combining archaeology, molecular ecology and Mātauranga Māori (Māori knowledge).

Additionally, based on observed regional differences in shell shape, we are exploring the idea that shell morphometry (shape analysis), may be a useful tool for testing the translocation hypothesis and examining relationships between toheroa populations and their environment. The summer student associated with this project will have two roles. The first will be to use Fourier shape analysis to compare shells collected from toheroa populations throughout New Zealand.

The student's second role will be to assist with ecological research being conducted over the summer in northern New Zealand.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		PROJECT #:	57
Supervisor/s:	Bruce Clarkson & Lois Easton (Gisborne District Council)		
Project Title:	Health of wetlands and protected natural areas in the Gisborne Region		
Faculty:	ERI	Field:	botany/biology

EXPECTED OUTCOMES:

An inventory of the state and threats to the most significant natural areas in the Gisborne Region

STUDENT TASKS:

1. Field data collection
2. Field data entry

REQUIRED SKILLS:

1. plant identification and ecological understanding of terrestrial and wetland ecosystems
2. good physical fitness
3. willingness to spend 3 months in the field
4. can do attitude
5. confidence working remotely
6. drivers licence

PROJECT ABSTRACT:

Implementation of a field based methodology to assess the current health and threats of native vegetation and wetlands in the Gisborne Region. This will involve field work across the region identifying plant species, birds and other wildlife and using an assessment method developed by Professor Clarkson to assess the health of these areas.

We are seeking 4 students/scholarships to undertake this work.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #: 67
Supervisor/s:	Bruce Clarkson & Manu Caddie (Hikurangi Enterprises Ltd)	
Project Title:	Medicinal native plants in the Hikurangi Takiwa	
Faculty:	ERI	Field: Botany / Biology

EXPECTED OUTCOMES:

- An inventory of the medicinal native plants in the area between Te Puia Springs and Rangitukia.

STUDENT TASKS:

1. Literature Review
2. Field Data entry in GIS

REQUIRED SKILLS:

1. Plant identification
2. Good physical fitness
3. Willingness to spend one month in the field
4. Can do attitude
5. Confidence working remotely
6. Fulls Drivers License

PROJECT ABSTRACT:

A Literature Review of scientific and ethnographic literature on medicinal benefits of native plants endemic to the area including DOC RAP & GDC PMA reports on common plants in the area.

Fieldwork with DOC, GDC and hapū trusts mapping areas known to be growing identified plants. This will involve working across the survey district between Waipiro Bay, Rangitukia and Hikurangi Maunga.

We are seeking one student to undertake this work.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	58
Supervisor/s:	Kay Weaver & Marcia Johnson		
Project Title:	Training for what? Doctoral student's perceptions of doctorate education and employability?		
Faculty:	School of Graduate Research	Field:	Higher Education

EXPECTED OUTCOMES:

1. A co-authored conference paper
2. a co-authored journal publication.
3. The Summer Research Scholar will be a co-author of these submissions.

STUDENT TASKS:

1. Create an online survey form
2. Collate survey data
3. Assist with survey data analysis
4. Assist with write-up of survey findings
5. Assist with one-to-one interview data collection
6. Transcribing and coding of interview data
7. Assist with interview data analysis

REQUIRED SKILLS:

1. Excellent general computing skills
2. Willingness to learn survey data collection tools (Google Forms or LimeSurvey)
3. Simple data analysis skills in Excel
4. Excellent interpersonal communication skills
5. Willingness to learn interviewing skills
6. Willingness to learn how to transcribe and code interview data

PROJECT ABSTRACT:

Tertiary education has witnessed significant increases in doctoral enrolments and changes in the career destinations of doctoral graduates in the last two decades. Until recently, most graduates could expect to secure an academic position, but this career path is now far from assured.

The increased proportion and diversity of people holding a doctoral qualification has contributed to both the decline of its 'elite' nature and the employment advantage that comes from having a credential that few possess.

In the UK, for example, only 14% of PhD graduates now gain an academic post, and only 19% are in tertiary research positions three and a half years after graduating. Trends in doctoral education and employment in Europe were a key focus of the 3rd Cycle of the Bologna Process which raised concerns about the narrow learning objectives of the PhD. It recommended that doctoral programmes should promote interdisciplinary training and the development of transferable skills to meet the needs of the wider labour market.

In short, a major theme running through reforms to doctoral education has been the need to focus on general skills outcomes in addition to the doctoral research itself. Consequently, in Europe and Australasia a range of transferable skills and/or researcher development programmes have been established within universities. New Zealand universities are headed in a similar direction.

The University of Waikato has not yet created its own such programme, though it has developed a structure for taught courses within the PhD which allow for this. Although the University could adopt models of skills training developed elsewhere, it is important to determine what Waikato students actually want and need in terms of that training. What do students consider appropriate for their future employment, and what challenges do they perceive when seeking jobs? Yet, rarely are any doctoral students' views sought in any international context on how or whether their experiences and learnings have supported, enhanced, or hindered their career opportunities.

This research project will address a gap in knowledge about doctoral students' perceptions of their skill needs for employment. It includes an online survey and interviews with current and graduated students. Using a stratified random sample of Waikato doctoral students at three stages of study/career (pre-enrolment, one year prior to completion, and two years post graduation), it will probe their perceptions and experiences of doctoral education and the employment market. Questions about the learning experiences students expect to encounter during and post-graduation will be posed, as too will questions about the range of skills students need to acquire in doctoral study. Survey participants will be invited to a follow-up interview in which their career aspirations and requisite skill sets will be explored more deeply.

Key outcomes of the project will be a conference presentation and a peer-reviewed academic publication, both of which the summer student researcher will co-author.

The findings will also be used to inform developments in doctoral transferable skills training programme at the University of Waikato.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #: 59
Supervisor/s:	Tom Roa	
Project Title:	Maiea Te Tupua	
Faculty:	SMPD	Field: New Zealand/Māori History

EXPECTED OUTCOMES:

Publication Outcome: A bilingual, searchable, eBook to be available for use by students of New Zealand and Māori history.

Student Outcomes: Development of: i) Kaupapa Māori research capability; ii) IT skills (particularly in the preparation of an eBook); both of which can be further pursued in Graduate study.

STUDENT TASKS:

1. Meet as required with Supervisor (except over Statutory Xmas break).
2. Arrange 2 Focus Group wānanga: one early in the project, one near the end of the project.
3. Keep a journal of the wānanga, and of process/protocols involved in the project
4. Assist in the preparation of the hard copy texts for publication as an eBook
5. Should the NZQA Qualification Project be accepted, work the a team of the two successful applicants and the Supervisor
6. Prepare reports for the Iwi, for the Fous Groups, for general publication.

REQUIRED SKILLS:

1. Completed Stage 2 Māori Papers
2. High level of competency with English Language
3. Team player
4. Very good communication skills
5. Confident with computer technology

PROJECT ABSTRACT:

In commemorating the centenary of The Great War 1914-1918, Tom Roa and Maehe Paki collected and published, in book and DVD formats, Waikato-Maniapoto wh ☐ a
veterans of the war.

A mere 50 years after the Battle of Orakau, young Māori were being sent to fight for the very Empire responsible for the loss of their parents, grandparents, livelihoods, and lands. The English version was launched on ANZAC Day 2015, the Māori on ANZAC Day 2016.

An NZQA qualification based on the events and aimed at Year 12 level and above is in preparation along with an eBook launch of both planned for ANZAC Day 2017. The eBook will be a searchable resource for students of New Zealand History as well as for the NZQA qualification.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	60
Supervisor/s:	Sophie Nock		
Project Title:	How does learning te reo Māori improve the health and wellbeing of learners in a community contextual setting?		
Faculty:	SMPD	Field:	Social sciences- te reo Māori and health and wellbeing

EXPECTED OUTCOMES:

1. A publication
2. a presentation at an international and/ or national conference, a report of findings back to participants

STUDENT TASKS:

1. The student will organise, conduct, and record all semi-structured interviews (5- 10 participants) in a space and time conducive to each participant. Distribute questionnaire (10-20 participants). Adhere to follow the code of conduct when conducting all interviews; This code of conduct consists of; Aroha ki te tangata (have respect for people); Kanohi kitea (present yourself to people face-to-face); Titiro, whakarongo, korero (look, listen, speak); Manaaki ki te tangata (share and host people, be generous); Kia tupato (be cautious); Kaua e takahia te mana o te tangata (do not trample on the mana of people); Kaua e māhaki (do not flaunt your knowledge) (Smith, 2012, p.124).
2. Transcribe all semi-structure interviews while respecting, valuing and acknowledging the information that has been gathered. Returning transcripts back to participants for corrections or approval. Making any corrections or adjustments where required. Ensuring all transcripts are coded, safe and secure.
3. Ensure all data from questionnaire is entered correctly to ensure confidentiality.
4. Create an initial annotated bibliography on selected literature
5. Create a full endnote bibliography

REQUIRED SKILLS:

1. A high level of competency, understanding, written and listening ability in te reo Māori and English.
2. An excellent understanding of tikanga Māori and kaupapa Māori, particularly when conducted interviews. Adhere to follow the code of conduct when conducting all interviews; This code of conduct consists of; Aroha ki te tangata (have respect for people); Kanohi kitea (present yourself to people face-to-face); Titiro, whakarongo, korero (look, listen, speak); Manaaki ki te tangata (share and host people, be generous); Kia tupato (be cautious); Kaua e takahia te mana o te tangata (do not trample on the mana of people); Kaua e māhaki (do not flaunt your knowledge) (Smith, 2012, p.124).
3. Some experience or understanding of conducting semi-structured interviews, and how to use technology to record interviews

STUDENT TASKS CONT:

4. Experience in transcribing, whereby the information gather is to be respected, valued and acknowledged. Understanding the importance of confidentiality and keeping data safe and secure.
5. Experience with data entry and understanding the importance of confidentiality and keeping data safe and secure.

PROJECT ABSTRACT:

Māori make up 15% of the population and whilst it is well publicized that Māori have some of the worst statistics in health (physiological or psychological indicators) and wellbeing (life satisfaction and happiness) such as; smoking, hazardous drinking, life expectancy, obesity, suicide, and psychological distress this research project will highlight the potential of learning te reo Māori as an avenue to improve your health and wellbeing. The question underpinning this research project is, How can and/or does learning te reo Māori improve the health and wellbeing of learners in a community contextual setting and what is the extent of this improvement? In an article by Nicholas (2009), she interviewed three Hopi youth about being brought up without their heritage language, all three youth agreed, that the Hopi language is fundamental to 'fully' participating in and understanding the Hopi way of life... (p.321). Nelson & Prilleltensky, (2005) state there are many aspects and facets that determine a person's wellbeing, at an individual level, these include; personal control, self-esteem, competence, independence, political rights and a positive identity (p.28).

When describing criteria in respect to the wellbeing of Māori, Durie (1994, 1998, 2001) uses the metaphor of the whare tapawhā/the four sided house to explain the Māori holistic model of health, which consists of four realms, the taha tinana (physical), the taha hinengaro (emotion), the taha whānau (social) and the taha wairua (spiritual).

I will use responses to the question What constitutes a healthy Māori? from participants at Te Ara Ahu Whakamua hui (Te Puni Kokiri, 1994), some of which included self-esteem, control over one's destiny, intellectual alertness, for this research I will use the following (1) identity, (2) whānau, and (3) knowledge of te reo Māori/culture. Combining these three aspects as the main themes will give this research project a holistic approach to health and wellbeing and will help us to understand the potential of how and why learning te reo Māori can/does have an impact on a person's health and wellbeing. As a subsidiary question, participants will be asked for their perspectives on what impact not knowing their heritage language has had on their health and wellbeing.

A community contextual setting will be used whereby the supervisor will use her knowledge and networks within the community where her te reo Māori classes will be used to select and recruit participants. This research project will promote and apply a kaupapa Māori approach, and this will involve engagement with stakeholders/participants from within the community through kanohi ki te kanohi (semi-structured interviews) and questionnaire's.

This research will also be underpinned by tikanga Māori, where participant's māturanga (knowledge) will be respected, valued and acknowledged when collected. The semi-structured interviews and questionnaire will be supplemented by an annotated bibliography and/or analysis of selected literature on the impact of learning a heritage or indigenous language and/or te reo Māori on the health and wellbeing of indigenous and/or Māori people and the impact of not knowing their heritage language.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	61
Supervisor/s:	Nirosha Hewa Wellalage & Stuart Locke		
Project Title:	Financial Inclusion for New Zealand Refugees		
Faculty:	WMS	Field:	Finance

EXPECTED OUTCOMES:

1. The research project will significantly increase the successful applicant's applied research capability, especially in data collection techniques, statistical methods and analysis, working with external stakeholders, report writing and presentation.
2. Research paper suitable for a conference and publication will be drafted.

STUDENT TASKS:

1. Develop survey questionnaire and successfully obtain ethics approval for the research.
2. Communicate with Waikato Migrant Resource Centre-Hamilton and distribute Survey questionnaire.
3. Student will have to develop research methods for analysing the collected data (qualitative and quantitative)
4. Conduct a literature review on financial inclusion and refugees
5. Prepare a poster summarising the research to be displayed at the Summer Research Scholarship end function.
6. Prepare a report summarising the results of the study and present the study findings to Department of Finance monthly seminar series.

REQUIRED SKILLS:

1. Required: Familiarity with qualitative and quantitative research methods and analysis.
2. Required: Familiarity with Microsoft Excel, and statistical analysis skills.
3. Desirable: Good interpersonal and communication skills.

PROJECT ABSTRACT:

The aim of this research is to understand the financial inclusion level of New Zealand refugees and financial inclusion contributes to the long-term development of New Zealand. Financial inclusion, describes the use of formal financial services and has become a subject of growing interest for policy makers, and other financial sector stakeholders.

The G20 leaders expressed a commitment to expanding financial inclusion and are supporting and efforts to meet the challenge of promoting financial inclusion around the world.

A growing body of research focuses on the beneficial effects for individuals, providing both an economic and a political rationale for government policies to promote financial inclusion. In particular, the evidence is most compelling when it comes to the use of bank accounts. Having a bank account increases savings (Aportela, 1999), female empowerment (Ashraf et al., 2010), and consumption and productive investment of entrepreneurs (Dupas and Robinson, 2009).

The literature on financial inclusion has identified financial exclusion as a reflection of a broader problem of 'social exclusion'. In the industrialised and high income countries having a well-developed banking system, studies have shown that the exclusion from the financial system occurs for persons who belong to low-income groups, the ethnic minorities, immigrants, the aged (Kempson and Whyley, 1998; Connolly and Hajaj, 2001; Barr, 2004). In other words, the levels of financial inclusion inevitably rise in response to both prosperity and declining inequalities.

Research Question 1: What factors are associated with the financial exclusion of refugees in New Zealand?

Research Question 2: What enables will encourage greater levels of financial inclusion for refugees? This project adopts a survey research method approach to explore factors that are associated with the financial inclusion and refugees in New Zealand context. Following the FinScope survey, developed by FinMark Trust and was first piloted in 2002 in South Africa, we conduct the survey to measure and profile the levels of access to and uptake of financial products/services (both formal and informal) among a refugee group in New Zealand.

This study will use the software program STATA for all statistical analyses. Sampling technique Criterion sampling method will be employed in this study. In the statistical analysis, the following dataset will be used: Individual categorised as a 'refugee' visa status and living in Hamilton, Waikato. Data from the questionnaire will be analysed using parametric or nonparametric regression.

To effectively financially integrate refugees into the New Zealand, it is necessary to coordinate legal, financial, and other direct services that are offered to support this community. In this facilitated small group session, participants will learn from one another as they explore best practices for improving collaboration and communication among service providers, discuss ways to engage refugee communities through culturally appropriate vehicles, especially where religious precludes paying or receiving interests, and identify other community partners to include in a coordinated effort.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
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Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #: 62
Supervisor/s:	John Gibson	
Project Title:	Unit Values and the Relative Price of Quality	
Faculty:	WMS	Field: International Trade, Public Economics, Development Economics

EXPECTED OUTCOMES:

1. A database that can be used for future publications,
2. a systematic review which may support on-going research by the principal investigator.
3. The student would gain good preparation for a substantial (e.g. 3-paper thesis or large) future research paper related to this topic.

STUDENT TASKS:

1. Systematically review literature in international trade journals using unit values
2. Systematically review literature in development economics journals using unit values
3. Systematically review applied studies in development economics that could use prices if statistics on prices were available
4. Draw links between the two literatures using unit values
5. Provide a database of the studies reviewed, categorizing in a systematic way to allow future quantitative analysis

REQUIRED SKILLS:

1. Advanced knowledge of econometrics to be able to read the studies in the systematic review
2. Knowledge of economic theory to at least an intermediate level (e.g. Econ 202/302)
3. Ability to quickly extract key methodological features of applied studies published in journals
4. Ability to think critically and write concisely and clearly

PROJECT ABSTRACT:

Unit values are the ratio of expenditures on a group of goods to the group-level quantity bought or traded. They are commonly used in two branches of economics -- international trade, and development economics -- and in both areas they have been used as a proxy for finer level prices that researchers would like to use but which statisticians do not collect. The use of this proxy reflects ease of use since both trade statistics and household expenditure data report group level spending (e.g on imports of certain types of goods or of spending on particular types of foods from household budgets).

It has been known in the international trade literature since the late 1960s that unit values will be a biased measure of import or export prices because they capture quality differences in addition to price differences. For example, if New Zealand exports higher quality wine to Britain than to Australia, this compositional effect will see the unit value of wine exports to Britain being higher than to Australia but this does not imply price discrimination where the same bottle of wine is priced differently across export markets. In contrast, there has been much less understanding of biases due to use of unit values in the development economics literature using household-level data. These studies include efforts to calculate poverty lines (with unit values as a proxy for local prices) and to examine the response of demand to price changes due either to government policy (e.g. taxes and subsidies) or to international price shocks.

The bias from using unit values to measure prices will increase as developing countries get richer because of the transformed supply chains that occur with the process of economic development. These changes see food increasingly shipped, stored and processed and since these activities cost the same for low quality and high quality items within a food group, they will cause the relative price of quality to vary over time and space (also known as the Alchian-Allen effect). The aim of this project is to survey the literature using unit values in international trade and in development economics to draw links between these two separate areas where research methods have evolved independently. For example, there may have been innovations in data collection in international trade, or particularly convincing empirical studies that saw trade economists start to put much more effort into understanding pricing differences between different markets rather than relying on flawed evidence from unit values.

The literature survey will also highlight the ongoing gaps in the evidence used by researchers who aim to understand household behaviour in developing countries. In particular, the project will highlight the range of settings and studies where researchers continue to rely on unit values because the appropriate price data are not collected. The project will make a contribution to informing researchers and to refining the demands for improved price statistics in developing countries. These themes have been prominent in the research of the principal investigator and could lead to future research opportunities

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	63
Supervisor/s:	Michael Cameron		
Project Title:	Small-area needs assessment for aged care in the Waikato Region		
Faculty:	WMS	Field:	Economics; Population Studies

EXPECTED OUTCOMES:

The research project will significantly increase the successful applicant's applied research capability, especially in data manipulation and analysis, working with external stakeholders, and report writing. The University will benefit from promoting a closer research relationship between the University and Waikato District Health Board. The Institute of Healthy Ageing is another key stakeholder that will benefit from this project. This project builds on work a developing research collaboration between the supervisor, Professor Ross Lawrenson, and Professor Matthew Parsons (University of Auckland).

STUDENT TASKS:

1. Familiarise themselves with the InterRAI dataset and hospitalisation data from Waikato DHB.
2. Link InterRAI data to hospitalisation data for each individual in the InterRAI data for the Waikato DHB region.
3. Produce summary statistics for different needs scales (Dementia, Function, Extended Function, Carer Stress, Depression, Risk for Falls) from the InterRAI data by meshblock (or area unit).
4. Develop statistical models that predict hospitalisations (by ICD10 code) from InterRAI data.
5. Write a report describing the methods and results, and commenting on the plausibility or otherwise of the estimates.
6. Prepare a poster summarising the research to be displayed at the Summer Research Scholarship end function.

REQUIRED SKILLS:

1. Statistical analysis skills (e.g. STAT221, ECON204), including familiarity with a statistical package, eg R, Stata, or SAS.
2. Good written communication skills.

PROJECT ABSTRACT:

'Ageing in place' is a critical underlying principle of New Zealand's policies on ageing, but by definition, 'ageing in place' leads to a wider geographical distribution of older people (relative to a policy of centralising aged care). So, we can likely expect to see increasing demands for aged care over time, in rural and peripheral areas that are rapidly ageing.

However, there is currently little information available about the prevalence of aged care needs at small-area level in New Zealand, which would allow for detailed modelling of future aged care needs. The InterRAI is a comprehensive clinical care assessment conducted with older New Zealanders. It includes four assessments (home care, residential (long term care), palliative, and contact). Linking the InterRAI data to District Health Board data on hospital admissions (by ICD10 code) will help to increase our understanding of how care needs (as assessed by the InterRAI) relate to health systems demand. Small-area measures of health systems demand by older people (and future projections of this demand) can then be developed by exploring the InterRAI data at small-area level.

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
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Tē Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #: 64
Supervisor/s:	Geeta Duppatti & Frank Scrimgeour, Andrew Smart	
Project Title:	Financing Refugee Settlement in New Zealand: Issues, Challenges and Opportunities	
Faculty:	WMS	Field: Financial Economics

EXPECTED OUTCOMES:

The study will result in an academic paper on refugee policy and the creation of a data set that will be used in subsequent analyses. The future work will model the costs and benefits of different refugee acceptance policies. This study should inform policy decisions on how to address the current challenges.

STUDENT TASKS:

1. Review of Literature
2. Data Collection
3. Interviewing the refugees and corporates
4. Obtaining secondary data from the relevant sources
5. Analysing the data
6. Writing a research report

REQUIRED SKILLS:

1. Analytical Skills required for using Software packages like: STATA and E-Views
2. Understanding about the Data Bases
3. Reading and Writing Skills
4. Soft skills

PROJECT ABSTRACT:

The study addresses the economic and social effects of refugee settlement in New Zealand during the period 2005-15. Given, the backdrop of international experiences including Europe and other developed countries, the study focusses on refugee settlement/integration policy implications pertaining to job opportunities and housing facilities.

As pointed by Poot (2016), there is immense scope to expand the literature by using mixed approaches: qualitative and quantitative data analysis that has validity in the New Zealand context. Earlier studies mostly used a qualitative analysis approach with a special focus on refugee settlement (Searle, W., Prouse, Emma., L'Ami, Emily., Gray, A & Gruner, Anna, 2012) while others identify and document patterns of assimilation of arrival cohorts. These vary across cohorts and across countries of birth (Mare, D., Poot, J., & Roberts, C. (2016).

Another prior study documented the experiences of refugee youth in their first 12 months in New Zealand (Rachel, 2014). In the immigration studies literature, integration is understood in terms of social service provision by the receiving society and access to social services that facilitate settlement (Korac, 2003). Reitz (2002) discusses four determinants of integration in receiving societies: pre-existing ethnic relations with host populations, labour markets, government policies and programmes, and the changing international boundaries.

This study will estimate: Government expenditure on refugee settlement; Government support of refugees post settlement; Income earned by refugees post settlement; Refugee well-being post settlement. It considers the time profile of costs and benefits associated with refugees and how that changes with refugee characteristics, the state of the New Zealand economy and the actions taken by government, NGOs and businesses. The study uses mixed method approach in analysing the data that is obtained from the primary and secondary sources. After obtaining ethical approval, qualitative interviewing will be used to obtain the primary data from refugees, NGOs, and corporate and the secondary data from Government sources and will be aggregated to prepare a national assessment of the costs associated with migrant settlement and the economic contribution of refugees after they are settled.

The primary data will be analysed using Analysis of Variance (ANOVA) and related analyses. The secondary data will utilise the panel regression technique. References: Korac, M. (2003). Integration and how we facilitate it: A comparative study of the settlement experiences of refugees in Italy and the Netherlands. *Sociology*, 37, 51- 68. Mare, D., Poot, J., & Roberts, C. (2016). Residential assimilation of migrants. In *Asymmetric Information: Newsletter of the New Zealand Association of Economists* (April ed., Iss. 55, pp. 12-14). New Zealand Association of Economists. Poot, J. (2016). Social networks and successful settlement of refugee youth: recent research findings. In 2016 National Refugee Resettlement Forum, New Zealand Immigration, Ministry of Business and Employment, Wellington, New Zealand. Rachel O'Connor (2014), Waikato Manager, Red Cross Refugee Services 422 Te Rapa Rd, Te Rapa, Hamilton 3200. Rietz, J. (2002). Host societies and the reception of immigrants: Research themes, emerging theories and methodological issues. *The International Migration Review*, 36(4), 1005-1019. Searle, W., Prouse, Emma., L'Ami, Emily., Gray, A & Gruner, Anna (2012) *New Land, New Life: Long-Term Settlement of Refugees in New Zealand*. MBIE

Summer Research 2016/17

Project Abstract



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

ACADEMIC PROJECT SUBMISSION DETAILS:		Project #:	65
Supervisor/s:	Mary Simpson & Brendan Hokowhitu		
Project Title:	He Oranga Kaumatua: Ngā kōrero a ngā Kaumatua. Kaumatua well-being: Kaumatua stories.		
Faculty:	WMS	Field:	Māori wellbeing; Health communication

EXPECTED OUTCOMES:

1. Involvement of kaumātua in defining well-being for themselves
2. Kaumatua stories and experience shared in accessible forms and published by Rauawaawa kaumātua Charitable Trust and the University of Waikato.
3. A published journal article co-authored by the parties associated with the summer scholarship project.
4. Knowledge of kaumātua well-being to inform a research grant application or a postgraduate student research project.

STUDENT TASKS:

1. Carry out specific tasks identified in the project plan developed by the supervisors.
2. Attend Rauawaawa kaumātua events (e.g. Kotahitanga social day, Health Expo, Kaumatua Olympics).
3. Interview kaumātua about their experiences at Rauawaawa.
4. Write up kaumātua stories.
5. Present written stories back to kaumātua story-tellers to correct, improve, and/or endorse.
6. Identify outlets and formats for possible publication (e.g., Rauawaawa webpage, book, blog, oral record).
7. Write a summary report of the project (1000-2000 words).

REQUIRED SKILLS:

1. Some understanding of Māori cultural values and protocols.
2. Ability to engage in conversation with people of different backgrounds, and with elders and Māori kaumātua in particular.
3. Any experience with story-telling (if possible) - e.g., creative writing, film making, performance, blogging.
4. Ability to plan and carry out specific tasks within specified time-frames.

PROJECT ABSTRACT:

Kaumātua (koroua and kuia) in later years of life are often supported by whanau, as well as by social and health care agencies' including kaupapa Māori providers. The purpose of this summer scholarship research is to find out how kaumātua experience well-being in the context of support from a for-Māori-by-Māori social service agency: Rauawaawa kaumātua Charitable Trust (Rauawaawa).

The importance of this project lies in its potential to help identify how involvement with a kaupapa Māori organisation helps to address the disproportionate burden of ill-health in older age that falls on Māori communities and whanau (e.g., Dyall et al, 2014). Research has consistently identified the need for improved and culturally appropriate health communication for Māori within health providers (e.g., MacLeod, 2008). In addition, models, values, principles and understandings of Māori health and well-being are well documented (e.g., Durie, 1985, 2003; Martin, 2002; Pere, 1984), with whanau and individual, physical and spiritual, emotional and mental, and environmental dynamics playing significant roles.

This project focuses on the experiences of koroua and kuia as, not only users of Rauawaawa's services, but as members of the wider community created by the Rauawaawa, and the impact of this on their sense of well-being. Having kaumātua tell their own stories of well-being is self-determination in action. The voices of kaumātua deserve and need to be heard, and it is important for kaumātua to tell their own stories of well-being in their own words.

The student in this summer scholarship research project will, with the support of appointed kaumātua, talk with koroua and kuia about their experiences with the Rauawaawa and the impact on their well-being. The stories will be collected and published to promote the ways in which kaumātua experience well-being and in particular, experience well-being through their association with a kaupapa Māori organisation such as Rauawaawa. All hui and korero will take place at the Rauawaawa and ethics approval will be sought from the supervising faculties. Note that the student will be jointly supervised by staff from Management Communication Te Raupapa, and Te Pua Wananga ki te Ao.

References Dyall, L, Kepa, M, Teh, R., Mules, R., Moyes, S.A., Wham, C., et al. (2014). Cultural and social factors and quality of life of Māori in advanced age. Te puawaitanga o nga tapuwae kia ora tonu - Life and living in advanced age: a cohort study in New Zealand (LiLACS NZ). The New Zealand Medical Journal, 127, 62-79. Durie, M. (1985). A Maori perspective of health. Social Science and Medicine, 20(5), 483-486. Durie, M. (2003). Ngā Kahui Pou Launching Māori futures. Wellington: Huia. Pere, R. R., (1984), Te Oranga o te Whānau: The Health of the Family's in Hui Whakaoranga: Māori Health Planning Workshop, Department of Health, Wellington. Martin, H. (2002). TUHA-NZ: A Treaty understanding of hauora in Aotearoa New Zealand. Auckland: Health Promotion Forum of New Zealand. Retrieved (11,19,2010) from <http://www.hpforum.org.nz/resources/Tuhandzpdf.pdf> MacLeod, R. D. (2008). Respecting culture near the end of life. European Journal of Palliative Care, 15, 57.