Nimish Nagesh Kulkarni
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RESEARCH INTEREST

Multiscale Modeling, Computational methods and simulations, Energy sustainability

EDUCATION

Indian Institute of Technology, Bombay, Mumbai, Maharashtra, India
Bachelor of Technology, Chemical Engineering
Overall GPA 7.64/10; Senior year GPA 9.09/10 (Expected graduation date: May 2015)

Saraswati Bhuwan College of Science, Aurangabad, Maharashtra, India
Grade 12th Aggregate 86.16%, June 2010

Saraswati Bhuwan High School, Aurangabad, Maharashtra, India
Grade 10th Aggregate 94.15%, June 2008

ACCOLADES

- Received Undergraduate Research Award (URA-01) at IIT-Bombay *Dec'14*
- Secured All India rank 816 in Joint Entrance Exam(IIT-JEE) among 0.5 million candidates, 2011
- Secured International rank of 119 in International Mathematics Olympiad (IMO), 2009
- Received the National Talent Search (NTSE) scholarship awarded by Government of India, 2008
- Ranked First in Maharashtra state in Sanskrit and Mathematics in Secondary School exam, 2008

PUBLICATION

Nimish Kulkarni, Srikanth Divi and Abhijit Chatterjee; Cluster Expansion Model for Activation Energy of Surface Diffusion Exchange Move And Two Atoms Hop Move of Typical metal systems; *In preparation*

RESEARCH EXPERIENCE AND PROJECTS

Development of Cluster Expansion Model for Metal Surfaces
Guide: Prof. Abhijeet Chatterjee, IIT Bombay *Jan '14 – Present*

- To develop a model predicting the rate constant of atomic surface diffusion of metals
- Using simulations in Fortran, created a database of pre-factor and activation energy barriers associated with exchange moves of atoms on surface of a typical catalyst metal for large number of different possible local environment
- Developed a Cluster Expansion Model by fitting the data to predict the rate constant of a particular exchange move in a given environment of atoms

Development of Fast Fourier transforms code for 2-d system
Guide: Prof. Mukta Tripathy, IIT Bombay *Aug '14 – Nov'14*

- Performed a literature survey on Fast Fourier Transform for two dimensional radially symmetric function in polar coordinates

- Wrote a C code to evaluate Fast Fourier Transform with most efficient and accurate method

SUPERVISED PROJECTS

Jaggery making process and its advancements

Prof. Sanjay Mahajani, IIT Bombay *Jan'14-Apr'14*

Centre for technology alternatives for rural areas, IIT Bombay

- Interviewed rural stakeholders to the check feasibility of small scale Mobile Jaggery making unit
- Contributed in development of process design of the unit by considering specifications and constraints suggested by local stakeholders, especially changing conventional batch process into continuous process
- Conducted Quality Data Analysis (QDA) to standardize the food quality of Jaggery and thereby helping rural Jaggery manufacturers maintaining their product quality

Estimation of Salary of Baseball Players by Multivariate Regression

Prof. Mani Bhushan, IIT Bombay *Feb'13 - Mar'13*

- Crafted a model for prediction of salary of baseball pitchers in 1987 from available data of 1986
- Analyzed data and divided it into segments (training and testing) based on DUPLEX algorithm
- Carefully studied the variations of regressors with salary; transformed them on the basis of symmetry

Micro-reactors Fabrication

Prof. Rohit Srivastav, IIT Bombay *Jan'14-April'14*

- Identified major consumer requirements and derived functional specifications of micro-reactor like size structure residence time which are essential and supporting those requirements
- Outlined key steps to fabricate the micro-reactor device using Photolithography and Deep-reaction ion etching (DRIE) techniques with given functional specifications
- Estimated the minimum number of masks required for fabrication process

INDUSTRIAL EXPERIENCE

Reliance Industries Ltd. Jamnagar, India *May '14 – July'14*

Largest grass root petroleum refinery

- Designed experimental setup & standard operating procedure to test efficiency of deep bed filter aimed at particulate matter from Heavy Coker Gas Oil stream of Hydrotreater plant
- Correlated filter efficiency with variables like flow rate, filter medium, pressure drop & optimized its functioning by choosing relevant parameter values
- Impact – Direct use of results attained by lab scale experiments in proposing a key project to replace current technology with deep bed filters
- Offered PPO (Pre Placements Offer) to work as Graduate Engineering Trainee

Rashtriya Chemicals and Fertilizers, Mumbai, India

One of the leading Public Sector Undertaking industry in producing fertilizers *Dec '13*

- Modeled heat exchangers using actual stream data from sulfuric acid plant via Excel and HTRI software

- Generated design parameters from the above proposed design; compared with actual plant parameters to analyze heat losses; suggested possible techniques to reduce the same

POSITIONS

Department Academic Mentor, Chemical engineering department, IIT Bombay *Apr '14 – Present*

- Assisting 2 academically weak students to cope up with academic load & improve their performance
- Mentoring 9 second year students by providing guidance to maintain healthy academic-extracurricular balance

Class Representative, Fourth Year Chemical Engineering Batch, IIT Bombay *Apr'14-Present*

- Elected among 125 students to voice students issues among department authorities
- Coordinated with professors and teaching assistants and managed the class schedules, lab timetables and overall smooth conduction of academic courses