
DHRUV GUPTA

Department of Chemical Engineering
Indian Institute of Technology-Bombay, Mumbai 400 076, INDIA
Email: gupta.dhruv@iitb.ac.in

EDUCATION

B.Tech, Chemical Engineering

07/2009- present

Indian Institute of Technology-Bombay, India (CGPA 9.04/10)

CBSE

Grade 12th, The Mother's Intl. School, New Delhi, India (93%)

03/2009

Grade 10th, Delhi Public School, Hardwar(90.2%)

03/2007

RESEARCH EXPERIENCE

□ **Effect of acoustics on breakup of thin films**(Ongoing senior thesis)

Guide-**Dr. Mahesh S Tirumkudulu**, IIT-Bombay

Started 08/2012

Industry Partner-Indian Space Research Organisation

- Investigating combustion instability in high density combustion chambers
- Simulating deformation of thin fuel liquid sheet in presence of acoustic forcing
- Employing Boundary Element Method for solving the partial differential equations
- Comparing this simulation with experiments being conducted by other members of research group

□ **Data based modeling and safe parking operation**

Guide-**Dr. Prashant Mhaskar**, McMaster University, Canada

06/2012 to 07/2012

McMaster Advanced Control Consortium & PRAXAIR(Industry Partner)

- Work done as part of **MITACS Globalink fellowship** 2012
- Aimed at achieving Model Predictive Control for safe parking of plant during faults
- Generated plant data using Honeywell UniSim[®] simulator
- Characterised system using AutoRegressive Exogenous modeling
- Employed *Partial least square regression* and *fuzzy-c-clustering* for building piece-wise affine model

□ **National Solar Thermal Power Testing, Simulation and Research Facility**

Guide-**Dr. Mani Bhushan**, IIT-Bombay, India

05/2011 to 11/2011

- Received the **Undergraduate Research Award** for the work
- Built a simulator for testing control schemes for an upcoming power plant
- Modeled and simulated dynamic response of various unit operations
- Solved coupled PDEs of the model using *Orthogonal Collocation on Finite Elements*
- Applied Extended, Unscented *Kalman Filters* and particle filter for states and parameters *estimation* on the stochastic differential equations for potential fault detection and diagnosis
- Comprehended results through limiting physical cases, sensitivity analysis etc.

□ **Pratham : IIT Bombay student satellite initiative**

Aerospace Department, IIT-B & Indian Space Research Organisation

04/2010 to 08/2010

- Part of 15 member team building satellite for measuring Total Electron Count of Ionosphere
- Designed and built parts of the Ground Station for Telemetry and Tele-command of the satellite
- Collaborated with IGP(Institut de Physique du Globe de Paris) for application of the payload data to industry

SHORT PROJECTS

□ **Adiabatic Calorimetry experiment**

Guide-**Dr. Hemant Nanavati**, Dept. of Chemical Engineering, IIT-B

Spring 2011

- Conceptualized a novel methodology for conducting undergraduate laboratory experiment
- Improved accuracy of results and reduced usage of chemicals by 45%

□ Microreactor Sensors for Biomedical Applications

Guide-Dr. Rohit Srivastava, Dept. of Biosciences, IIT-B

Spring 2011

- Critiqued various chemical sensing techniques, power and space requirements of transport equipment like micropumps, valves, filters, tubings in microdevices
- Devised fabrication steps and testing schemes for a micro-scale chemical sensor module

INTERNATIONAL CONFERENCES

□ Bromley Lecture Series, University of Ottawa, Canada

05/2012

- Lectured on *Science Technology Innovation Policy* of Government of India
- Panelist representing India among 14 participating countries
- Guided by Dr. Chidambaram, Principal Scientific Advisor to Prime Minister of India

ACCOLADES

- Secured **rank 7** in National Science Olympiad among more than 100,000 candidates 2007
- Won National Talent Search Scholarship(**NTSE**) by NCERT, New Delhi, India 2008
- Secured **rank 895** in Joint Entrance Exam(IIT-**JEE**) among 0.4 million candidates 2009
- Secured **rank 1234** in All India Engineering Entrance Examination(**AIEEE**) among 1 million candidates 2009
- Received **Undergraduate Research Award** at IIT-Bombay 2011
- Awarded *Keep the Himalayas Clean Badge* at Atal Bihari Vajpayee School of Mountaineering and Allied Sports, Manali, India for exemplary leadership qualities as the Expedition leader and for spreading awareness on mountaineering and environmental ethics 05/2011
- Honorary Mention at Gandhian Innovation Award ceremony at *Indian Institute of Management-Ahmedabad* for work on “Academic Social Mobilization” 03/2012
- Awarded **MITACS Globalink** fellowship for 10 week research at McMaster University 2012

SPECIALIZED COURSES

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|------------------------------------|------------------------------------|
| - Electrical & Electronic Circuits | - State-Estimation |
| - Molecular Cell Biology | - Probability and Statistics |
| - Material Sciences | - Biomedical Microsystems |
| - Complex Analysis | - Product Development and Research |
| - Steam and Gas Turbines | - Artificial Intelligence |

POSITIONS

- Institute Engineering Mentorship Program: **Head & Overall Coordinator** 05/2011-04/2012
 - Spearheaded a team of 10 people for organising various technical and soft-skill *workshops*
 - Streamlined channels of constructive interaction within and between professors and students
 - Collaborated with professionals to devise sessions for students so they could stay *focused* on their respective goals, feel *motivated* and encouraged
 - Engaged students in intellectual *group discussions* on varied topics including abstract mathematics, technology, business innovation, science in sports, societal and political understanding
 - Organised lectures from professors to discuss their work and recruit student for short term projects
- Institute Academic Council: **Student Advisor**, IIT-B 04/2011-03/2012
 - Advised students on appropriate chronological order for taking courses
 - Answered queries and troubleshooted institute-wide course registrations for students
 - Publicized changes in academic policies through updated brochures and videos
 - Arranged sessions on research prospects and projects for undergraduates
- Mountaineering course, Ministry of Defence, India: **Expedition Leader** 05/2011
 - Led 65 people through 26 days of rigorous training course on mountaineering in the inhabitable conditions of lower Himalayas near Manali, India
 - Awarded “Keep the Himalayas Clean” badge for leadership, mental endurance, self-discipline and educating people on mountaineering and environmental ethical values

SPORTS

- Successfully completed *Swimmathon*, the annual *survival swimming competition* of IIT-Bombay by continuously swimming for 12 hours covering a distance of 21.5 Km 2010
- *Gold medalist* in Inter-Hostel water-polo general championship 2011
- Secured 3rd position in Triathlon (Cycling, Running, Swimming) in IIT-Bombay 2010
- “Special Mention” for actively contributing to and encouraging sports in student hostel 2011

ACADEMIC REFERENCES

Dr. Mani Bhushan (e-mail: mbhushan@iitb.ac.in)

- Associate Professor, Dept of Chemical Engineering, IIT-B
- *Guide for National Solar Thermal Project*

Dr. Mahesh S Tirumkudulu (e-mail: mahesh@che.iitb.ac.in)

- Associate Professor, Dept of Chemical Engineering, IIT-B
- *Guide for Senior Thesis(Acoustic forcing of thin films)*

Dr. Hemant Nanavati (e-mail: hnanavati@che.iitb.ac.in)

- Associate Professor, Dept of Chemical Engineering, IIT-B
- *Guide for improving adiabatic calorimetry experiment*

Dr. Prashant Mhaskar (e-mail: mhaskar@mcmaster.ca)

- Associate Professor, McMaster Advanced Control Consortium
- *Guide for MITACS Globalink internship at McMaster University, Canada*

PROFESSIONAL REFERENCES

Dr. Ganesh Ramakrishnan (e-mail: ganesh@cse.iitb.ac.in)

- Associate Professor, Dept of Computer Science and Engineering, IIT-B
- *Faculty Coordinator for Institute Engineering Mentorship Program*