

GAURAV AGARWAL

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Education

Indian Institute of Technology (IIT) - Kharagpur, India July 2015 - May 2020
Bachelor & Master of Technology (Dual Degree Honors) in Chemical Engineering. CGPA - 9.04/10
Micro-specialization in Biomedical Devices and Instrumentation

Bodhicarya Senior Secondary School - Kolkata, India May 2012 - June 2014
All India Senior School Certificate Examination, CBSE (Grade 12) 91.80%

Birla High School - Kolkata, India April 2002 - April 2012
All India Secondary School Examination, CBSE (Grade 10) CGPA 10/10

Research Projects

Research Associate - IIT Madras November 2020 - Present
Magnetic Microswimmers on the Interface Guide: Prof. Basavaraj Gurappa
• Developed the experimental setup to study magnetocapillary microswimmers.

Sessile Droplet Evaporation: Effect of gravity and substrate inclination Guide: Prof. Sumesh Thampi
• Literature survey on Multiphase Lattice Boltzmann models for evaporation study.

Master's Thesis Project - IIT Kharagpur March 2018 - April 2020
Droplet Dynamics on Patterned Surface Guide: Prof. Sunando DasGupta
• Fabricated a substrate with alternating wettability contrast utilising chemical gradients.
• Analysed droplet splitting from high speed camera recorded images using ImageJ and MATLAB.
• Obtained the variation of splitting velocity with the wettability difference of the contrast pattern.

Minor Project - IIT Kharagpur August 2019 - March 2020
Red blood cell mimicking PDMS Micro-particle Guide: Prof. Soumen Das
• Modelled droplet generation in microfluidics using Fluent and investigated the flow regimes.
• Fabricated the T-junction device using soft lithography techniques for generation of micro-particles.
• Characterized the continuous and dispersed phase properties and optimized the flow parameters.

Research Internship - Durham University, UK June 2019 - July 2019
Capillary Bridges during Liquid - Liquid Phase Separation Guide: Prof. Halim Kusumaatmaja
• Analysed the shape transformations of a vesicle with intra-membrane domains using Surface Evolver.
• Developed a platform for predicting the meniscus shape and forces between the vesicles during LLPS.

Research Internship - IMB, Academia Sinica, Taiwan May 2018 - June 2018
Investigating new genes related to NF- κ B family Guide: Dr. Sheng-hong Chen
• Analysed in-house database for understanding the cross-talk and the regulated biological functions.
• Identified two classes of genes showing a cell-type specific correlation with the NF- κ B family.
• Developed an analysis platform for predicting genetic networks of phenotypes using MATLAB.

Professional Experience

Industrial Internship - ITC Limited, Paperboards & Specialty Papers Division May 2017 - July 2017
Improving the formation of specialty paper
• Analysed the wet-end chemistry of retention aid chemicals and change in viscosity of pulp with time.
• Performed zeta-potential tests on various pulp mixtures to ensure stable suspension formation.
• Investigated the impact of dewatering foils and identified existing health issues with drum thickener.

Teaching & Leadership Roles

Teaching Assistant

July 2019 - May 2020

Reaction Engineering Laboratory and Process Engineering & Design

Department of Chemical Engineering, IIT Kharagpur

- Delivering tailored teaching activities to students on either a one-to-one basis or in small groups.
- Supporting professors by instruction (actual teaching), paperwork (like grading) & lesson planning.
- Helping out students by guiding and monitoring their progress throughout the semester.

Student Head

April 2016 - May 2020

Technology Transfer Group, IIT Kharagpur

- Led IIT Kharagpur in the 11th India Intellectual Property Convention & National IP Award 2019.
- Launched UG Research Portal, a platform to facilitate student projects in various disciplines.
- Organised the 2nd edition of INAE Youth Conclave, 2018 that saw a participation of 200+ teams.
- Conducted patent drives, numerous IP seminars, workshops & guest lectures to spread IP awareness.

Academic Achievements

- Ranked **2nd** in the Department of Chemical Engineering for the batch of 2015 - 2020.
- Recipient of the **2nd** Best Bachelor's Project Thesis in Chemical Engineering, class of 2015 - 2019/20.
- Recipient of the Biophysical Sciences Institute Summer Bursary, Durham University, UK, June - July 2019.
- Recipient of Merit-cum-Means Scholarship by Ministry of Human Resource Development, Govt. of India .
- Recipient of TIGP - International Internship Program award, Academia Sinica, Taiwan, May - July 2018.
- Awarded 1st prize for designing a biogas plant working on mess food waste in the Inter-Hall ChemQuest.
- Secured 99.78 percentile among 1.303 million candidates in Joint Engineering Entrance Examination, 2015.

Skills & Expertise

- **Programming:** C++, C, MATLAB, L^AT_EX
- **Tools & Frameworks:** COMSOL, Ansys Fluent, Surface Evolver, ImageJ, Solid Works(CAD)
- **Instruments:** Goniometer, Spin Coater, Ultrasonicator, High Speed Camera, Centrifuge, Rheometer, Plasma Cleaner, UV Oxidation Chamber and Optical Microscope

Relevant Courses

Fluid Mechanics, Transport Phenomena, Microscale Transport Processes, Instability and Patterning in Thin Polymer Films, Reaction Engineering, Microbiology, Biochemistry, Metabolic Systems Biology, Proteomics & Metabolomics, Human Anatomy, Physiology & Pathology, Mass Transfer and Heat Transfer.

Miscellaneous Activities

- Bagged 3 Silver Medals in What's the Good Word & Elocution in 2017, 2018 & 2019.
- Acted and directed in 7 Inter-hall Dramatics events, winning 1 Gold and 2 Silver Medals.
- Active member of Water Polo, and Volleyball team of RK Hall of Residence for the years 2017-19.
- Mentored 7 undergraduate students as a part of the Student Welfare Group (SWG) at IIT Kharagpur.

References

- Prof. Sunando DasGupta | Chemical Engineering, IIT Kharagpur, India | sunando@che.iitkgp.ac.in
- Prof. Halim Kusumaatmaja | Physics, Durham University, UK | halim.kusumaatmaja@durham.ac.uk
- Prof. Soumen Das | Medical Science & Technology, IIT Kharagpur, India | sou@smst.iitkgp.ac.in