

Saksham Sharma

B.Tech - Chemical Engineering
 Minor in Mechanical Engineering
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Education

Degree/Certificate	Institute/Board	CGPA/Percentage	Year
B.Tech	Indian Institute of Technology	8.69 (Current)	2014 - Present
Senior secondary	CBSE board	92.8%	2013
Secondary	CBSE board	10.0	2011

Experience

- **Summer Intern at Paris Descartes University** / May -July 2017 (Prof. Valerie Taly, CNRS Research Director, TRAM Lab)

Acoustic tweezers were used to manipulate single cancer cells inside a micro-milled channel. The design and flow pattern of buffer and cell suspension was optimized to obviate problems such as air bubbles, leakage, opacity of microwells. In another study, the effect of convection on drug uptake by a tumor inside microwell was modeled using COMSOL.

- **Summer Intern at IISc Bangalore, India** / May - June 2016 (Prof. Saptarshi Basu, FNAE, Multiphase flow and combustion lab)

Experiments on sessile droplet evaporation and buckling of the nanoparticle-loaded droplet were studied using a high-speed camera. Novel ways of understanding evaporation modes in former case and quantification of daughter cavity in the latter case were explored.

- **Green Track Contest |SNCF Réseau France | 2nd Rank/** Dec 2016 - March 2017 (Sami Yacoubi, Project Manager, SNCF)

An online ideation challenge which invited ideas to prototype a novel weeding strategy around railway tracks in France. We devised a network of swarm robots with smart mapping and ecofriendly spraying mechanism. The virtual prototype was applauded with 2nd rank and € 4500 prize in this global competition.

Publications

- **Universal Representation of evaporation modes in sessile droplets** - Sept 2017

A fundamental study of sessile droplet evaporation motivated us to formulate a universal representation mechanism of understanding droplet evaporation modes (CCA, CCR, SS). The results are published in PLoS One.

Projects

- **Microbial Fuel Cells** (Global Innovation & Technology Alliance, Mentored by Director, IIT-G) - *Ongoing*

Objective: To fabricate and model microbial fuel cells with optimized channel designs.

Industry: Tata Steel, Jamshedpur plant effluents will be tested as feedstock for the fuel cell.

- **Motion of CNC micromotors inside peroxide fuel (Diffusiophoresis)** - *Ongoing*

To explain the self-propulsion of cellulose nanocrystal & iron nanoparticles loaded micromotors due to pH gradient inside hydrogen peroxide. An analytical model based on Anderson 1989 is used to verify experiments with the aid of COMSOL simulations.

- **Plug formation of granular suspension inside microchannel** - *Aug - Nov 2016*

A course project on experimenting with the granular beads suspension inside a self-fabricated millifluidic channel. With utter frugality, we devised an experimental setup to validate the plug formation.

- **Simulating 2 phase flow in COMSOL** - *Oct-Dec 2015*

A computational model was devised to simulate physics of a water droplet falling on a hydrophobic substrate. The work was presented as a poster in Reflux, 2016.

- **MATLAB based GUI development** - *Oct 2015*

Developed a MATLAB based GUI to do the 2-D analysis of stress and strain of a given material. Various factors: factor of safety, mechanical failure of material etc. were evaluated

- **Mobile Robot Printer** - *March 2016*

The project was all about a robot which could move according to the movement of hands which is sensed by mouse sensor. We used the pyautoGUI and pyserial module, servo motors, omni wheels and PID algorithm to accomplish the target

Competitions/Conferences

- **Flow 17 Conference**, Paris July 2017

Attended this microfluidics conference and interacted with pioneers of Soft Matter field.

- **Shadow Comex Challenge | French Furnishings**, March-May 2017

Our team got trained for implementing Blue Ocean Strategy by mentors from HEC Paris. We collaborated with professionals of office furniture companies. The product prototype was made by incorporating products from AI & VR sector and taking customer's feedback through their real-time reactions.

- **Ideathon Contest, Nobel Prize Series**- India 2017, Jan 2017

Selected amongst top 150 students in India to attend a science symposium which was presided by 9 Nobel Laureates. The event was part of global Vibrant Gujarat Summit.

- **Go Green in the City Challenge 2016**, Schneider Electric, April 2016 - June 2016

Designed a rubber belt for the wood stove which can take waste heat from its surface to produce electricity and power small devices. With the help of mentor, we worked till semi-finals.

- **Process Design Competition (Reflux '16)**, March 2016

Proposed the design of biogas reactor for the institute. The design was based on Bureau of Indian Standards (BIS). Finally, the methodology was appraised and First position was secured.

Technical skills

- Events Team, Reflux- Chemical Engineering Symposium IITG, *March 2017*
- Student Peer Mentor, Student's Welfare Board, *September 2016- April 2017*
- Literary Secretary, Lohit Hostel, *March 2016 - April 2017*
- Core Team Member, Technothlon, IIT Guwahati, *December 2014 -September 2015*

Achievements

- Pradhan Mantri Protsahan Yojna: Got scholarship of Rs. 75,000 from State for admitting to IIT.
- JEE Main & Advanced : Ranked among top 2% in JEE Advanced & 0.4 % in JEE Mains 2014.
- School topper in Class 10th and 12th board examinations. Awarded with "Hope of DAV" award.
- 2nd Prize in an inter-state science quiz competition organized by an engineering college. Key courses taken

Key courses taken

- Fluid Mechanics, Thermodynamics
- Manufacturing Technology, Process Design
- Transport Phenomena, Microfluidics
- Microelectronic fabrication
- Numerical Methods, Optimisation Techniques
- Computational Fluid Dynamics
- Mass transfer and Heat transfer
- Introduction to Computing, Computing Lab

Extracurriculars

- **SAIL Team Core member:** A member of web team for maintaining website of SAIL- IITG.
- **Voluntary Work:** In the organizing team for conducting Guwahati Half Marathon.
- **Hostel competitions:** Participated in events of Manthan: Group Discussion and Article writing.