ADHISHREE APTE

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EDUCATION

Joint Program in Aerosol Science and Engineering 2022
Washington University in St. Louis & Indian Institute of Technology Bombay
GPA: 4/4 (Awarded the Dean's Fellowship)
Advisors: Prof. Rajan Chakrabarty & Prof. Chandra Venkataraman
Thesis: Correction Factors for Filter based measurements of Light Absorption by Aerosols

Bachelor of Technology and Master of Technology in Chemical Engineering 2017-2022
Indian Institute of Technology Bombay
GPA: 8.5/10 (Within top 10% of graduating class of 110 students)

RESEARCH EXPERIENCE

Graduate Research Student Aug 2021 - Dec 2021
Centre for Aerosol Science and Engineering, Washington University

- Conducted burn experiments and controlled sampling of aerosol emitted by diverse fuelsusing instruments including Scanning Mobility Particle Sizer and Integrated PhotoacousticNephelometer
- Assisted with laser alignment, calibration, and Allan deviation measurements of IPNs
- Led the onboarding and training of new lab instrument UV-Visible Spectrophotometer
- Designed and 3D printed CAD model of filter holder compatible with the integrating sphere-setup of the UV-Visible Spectrophotometer
- Analyzed filter samples collected during ground-based measurements of pan India COALESCE network
- Interpreted the data by writing Python scripts to comment on air quality at various sites in India

Summer Undergraduate Researcher May – Jun 2019
Guide: Prof. Abhijit Majumder, Department of Chemical Engineering, IIT Bombay

- Prepared PDMS Polymer Gel Substrates of varying stiffness by changing cross-linker to pre-polymer ratios
- Characterized Stiffness of substrates using Buoyant Force Microscopy– a frugal alternativeto Atomic Force Microscopy
- Automated the process of analyzing large data sets of microscope images by programming macros for ImageJ software employing Fibril Tool
- Prepared and presented the poster at institute wide undergraduate research symposium

Unilever Internship and BTech Project May – Dec 2020
Unilever Research and Development Centre, Bangalore

- Used MATLAB for programming a model to simulate microbial growth in response to nutrients and chemicals diffusing in the environment
- Built visualizations and time lapse videos of different interactions between microbes suchas parasitism, commensalism, mutualism, etc.
- Surveyed open-source agent-based simulation software such as GRO, CellModeller, etc.
- Used parallel processing algorithms and data structures to accelerate code runtime

TEACHING & MENTORING EXPERIENCE

Department Academic Mentor — July – Feb 2021
Served as mentor for three students and responsible for their academic well-being by helping them navigate coursework and extra-curriculars

Teaching Assistant – Advanced Reaction Engineering — Jan 2022- Jul 2022
Developed problems and assignment solutions for **advanced reaction engineering** course
Conducted weekly tutorial sessions, answered student queries and graded solutions

Teaching Assistant - English Language Improvement — July – Dec 2019
Conducted classes with interactive activities to increase student confidence and learning ofspoken and written English

Autonomous Underwater Vehicle Team — Jun – Aug 2018
Served on interview panels and developed tests for recruitment of new students to mechanical subdivision of the team

HONOURS AND AWARDS

Dean's Select Fellow - Washington University in St Louis — 2021
Scholarship for graduate study

National Talent Search Scholarship — 2015
Prestigious scholarship awarded to select 1000 students across the country

Advanced Performance Grade in Materials and Technology — 2017
Special grade awarded for exceptional performance in a cohort of 150+ students

CULTURAL EXCHANGE & TEAMWORK

Sustainable Transport System Infrastructure, Hokkaido University — May-Jun 2021

- Represented IIT Bombay at the exchange program hosted by Hokkaido University, Japan
- Completed basic Japanese language and culture course earning 3 HU credits

Autonomous Underwater Vehicle IIT Bombay — Sept-Aug 2018

- Student team participating in the annual Robosub competition at San Diego, California
- Matsya won 2nd prize in Robosub competition 2018 amongst 45+ international teams
- Designed extensively on SolidWorks, simulated on ANSYS, oversaw manufacturing andtested parts including underwater stop switch and robotic actuator
- Implemented high torque shaft coupling for the robotic actuator
- Developed technical documentation and delivered presentations during technical meets and exposition

INDUSTRIAL EXPERIENCE

Control System Engineer, SEDEMAC Aug 2022-Jul 2023

- Model based development using Simulink for Indian automobile R&D teams for electric two wheelers
- System engineering and algorithms development for demos of new 1500W and 3500W EV controller
- Developed Python package for automating analysis from large scale vehicle testing data
- Developed derating algorithm after extensive thermal testing of hardware for EV motor controllers
- Tuning the sensor-less motor control algorithms, vendor interaction and verification of dynamometer
- Liaison with hardware, software and testing departments to ensure product meets quality specs

Course on Wheels: Overview of Indian Chemical Industry Dec 2019

- Visited plants across sectors such as extraction & production, bulk, fine & specialtychemicals, fertilizers, pharma, power generation and industrial landfill
- Insight into chemical process design, equipment, plant layout and economics
- Prepared flowsheets of units like Hydrotreater, Platformer- Aromatics Unit, Coker, CrudeDistillation Unit, FCC pilot plant, etc.
- Simulated VGO (Vacuum Gas Oil) hydrotreater at Reliance Jamnagar on **DWSIM**- an open-source simulation software and flowsheet accepted by FOSSEE

OTHER PROJECTS

Spatial Chaos: Non-Linear Dynamics Nov - Dec 2020

- Developed MATLAB code for simulations of prisoner's dilemma in 2D
- Built video of the dynamic fractal images giving kaleidoscopic patterns

Engineering Challenge for Home Bodies March 2020

- Runner ups in conceptual design challenge to incorporate technology in daily chores
- Conceptualized a clip-alarm system to prevent milk overflow in vessels on cooktops

Digitalization: Lab Work Sept - Oct 2019

- Studied Batch Distillation Setup to improve the ease of experiment and automatically digitalize readings
- Exposure to DAC and LABVIEW software for digital measurement from the sensor

Speed of DC Motor Nov 2019

- Developed a device to measure rotation speed of DC motor using Decade Counters, IRSensor, and Stopwatch Timer
- Implemented two second timer circuit for tracking time using JK Flipflops

Line Follower and XLR8 Aug 2017

- Made a radio-controlled bot using L293D motor drivers and differential steering mechanism
- Programmed the bot with Arduino to follow black line
- Developed Maze Runner using ultra-sonic sensors

TECHNICAL SKILLS

Programming	MATLAB, C++, Data Structures and Algorithms, Python
Data science	Machine Learning, Linear Algebra, R, Excel, Julia
Tools	Solidworks, ANSYS, DWSIM, Open Foam, PyMieScatt

KEY COURSES

Engineering	Advanced Transport, Thermodynamics, Solid Mechanics, Chemical Process Design
Aerosol Science	Aerosol Science and Engineering, Optical Properties of Aerosols
Mathematics	Calculus, Partial Differential Equations, Numerical Analysis, Linear Algebra
Physics	Non-Linear Dynamics, Electricity and Magnetism, Quantum Physics