



Micky
Aerospace Engineering
Indian Institute of Technology Bombay

140010059
B.Tech.
Male
DOB: 27/01/96

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2018	7.24
Intermediate/+2	SGGS Senior Secondary School Sector 35 Chandigarh	SGGS Senior Secondary School Sector 35 Chandigarh	2014	92.20
Matriculation	Kendriya Vidyalaya Sector 47 Chandigarh	Kendriya Vidyalaya Sector 47 Chandigarh	2012	10.00

Pursuing HONORS in Aerospace Engineering Department

Scholastic Achievements

- Awarded the prestigious KVPY fellowship and attended the 3 day VIJYOSHI CAMP 2013 held at IISC 2012
- Awarded the prestigious National Talent Search Examination (NTSE) SCHOLARSHIP by NCERT 2009
- Accepted as a Google Summer of Code Student to contribute for open source software MOOSE 2017
- Cleared PRE-RMO (Regional Mathematics Olympiad) in the Punjab region 2012
- Awarded the CERTIFICATE OF MERIT and a GOLD MEDAL in NSTSE by Unified Council 2014
- Achieved a constant growth in academic performance (CPI) over five consecutive semesters

Work Experience

General Electric

May'17-July'17

Manager: Valliappan Chockalingam

- Developed a code in MATLAB and OCTAVE for generating NURBS surface from Point Cloud of scanned aircraft components
- Detected cracks using Convolutional Neural Networks package MXNet of R in aircraft engine's components

Google Summer Of Code

May'17-Present

Multiscale Object- Oriented Simulation Environment (MOOSE)

- Developed an understanding of MOOSE functioning and explored the possible ways to parallelize the "KSOLVE" solver
- Used Open MP in MOOSE "KSOLVE"(reaction-diffusion) solver and parallelized "KSOLVE" Solver using NVIDIA Cuda

National Center Of Excellence In Technology For Internal Security

May'16-July'16

Controls & Embedded Systems

- Controlled the position of the two flippers of the bot precisely using the feedback from encoders and PID control loop
- Using the PID control loop, coded on Arduino to make rpm of two motors to be the same as input for rpm given by the user
- Simulated the motion of DSMD (Deep Search Metal Detector), which is rotating and going forward, in MATLAB to know area the DSMD covers & hence to decide the optimum forward speed and rotation rate of DSMD so as to cover the maximum area

Mars Rover Team, IIT Bombay

July'15 - July'17

Working towards designing and fabrication of a tele-operated planetary rover

- Controlled the mobility of the rover by controlling its six wheels using Arduino Mega and Motor Drivers
- Controlled the motion of the robotic arm consisting of two actuators and a gripper using Arduino Due and Motor Drivers
- Designed and conducted an experiment to measure the BACK EMF of a motor in a circuit

Research Experience

Flame Stability In Micro-Combustors

July'17 - Present

Undergraduate Thesis | Guide: Prof. Sudarshan Kumar

- Conducting experiments in micro - combustors using high speed cameras to gather the image data of the flames
- Analysing the data obtained to understand the properties of flames like flame instability and periodicity in the flame motion
- Simulating the flame in micro-combustors in ANSYS to see the behavior of flames in different conditions

Conceptual Sizing Of A Long Range Transport Aircraft

Jan'17 - April'17

Supervised Learning Project | Guide: Professor Rajkumar S. Pant

- Completed conceptual sizing of Boeing 787-8 aircraft that includes modules like constraint analysis, aerodynamic coefficient estimation, weight breakdown, range payload diagram and direct operating cost
- Modularized the process using PYTHON so that it can be extended to other long range transport aircraft
- Joint author of a paper on this work, titled "Conceptual Sizing of Long Range Transport Aircraft" has been accepted for presentation at an international conference being held in September 2017 in Italy

Inverse Airfoil Design Using XFOIL

Jan'17-April'17

Supervised Learning Project | Guide: Professor A.M. Pradeep

- Given a target pressure distribution, an airfoil is generated that gives required pressure distribution
- XFOIL is used as the solver and its output is fed into the algorithm for changing the airfoil shape and then a new airfoil is generated and the process is repeated till convergence. The code for this process was developed in Python
- Tested the code for subsonic airfoils and can be extended to design transonic airfoils

Course Projects

Compressor Designing And Fabrication | Guide: Prof. Bhaskar Roy Jan'17 - April'17

- Designed centrifugal compressor consists of radial vanes and a diffuser and 3D Printed it using PA12 material
- Achieved an efficiency of 50% from the manufactured part with the pressure ratio of 1.015

Supersonic Serpentine Intake Design | Guide: Prof. Bhaskar Roy July'16 - Nov'16

- Designed supersonic serpentine intake for $M=2$ MRCA($BPR < 1.0$) and MRCA F22 Raptor was taken as a reference
- Oblique shock theory was used to calculate the positions of the 3 shocks such that the pressure loss was minimum
- Achieved pressure recovery factor of 86% with double wedged intake with one anchoring point for the 3 shocks

Propeller Design For A Low Speed Aircraft | Guide: Prof. Bhaskar Roy July'16 - Nov'16

- Propeller was designed for an aircraft consisting of 4 passengers, flight speed of 300 Kmph and the service ceiling of 5000 m
- Blade element theory was used to design the constant chord propeller and it had 10 sections of different airfoils

Design And Fabrication of Savonius Wind Turbine | Guide: Prof. Bhaskar Roy Jan'17 - April'17

- Achieved an efficiency of 10% from the manufactured part at 1500 rpm and wind speed of 10m/s
- The designed wind turbine had two cup shaped blades and was manufactured using 3D printing

Designing Powerplant Configuration | Guide: Prof. Bhaskar Roy Jan'17 - April'17

- Designed a power plant configuration for a light combat unmanned aircraft for some combat at 5000m and reconnaissance at 15 km altitude using MQ9 Reaper as a reference and low altitude (5000m) as the design point

Parallelization Using Various Tools | Guide: Asst. Prof. S. Gopalakrishnan Jan'16 - July'16

- Parallelized the matrix multiplication code using CUDA, Open MP and MPI
- Parallelized Power Method Algorithm for finding Eigenvalue using Open MP and CUDA

Air City Ambulance | Guide: Prof. Avijit Chatterjee July'17 - Present

- Designing a Tilt Rotor aircraft to be used as faster alternative to ground ambulance for transporting critical patients
- Conceptual design is under process and the project will culminate with the completion of preliminary design of the tilt rotor

Autonomous Bot | Guide: Prof. Kavi J Arya Jan'15 - July'15

- Worked on FIREBIRD V ATMEGA 2560 BOT and wrote a code in AVR Studio 6 to make the bot a static obstacle avoider by getting inputs from sharp IR and proximity sensors

Flow Simulation | Guide: Prof. Vineeth Nair July'16 - Nov'16

- Developed a code in Python for implementing source panel method on NACA 3516 at various angle of attacks and a free stream velocity of 15 m/s

Optimization For Finding The Best Gift | Guide: Prof. R.P. Shimpi July'16 - Nov'16

- Maximised the satisfaction level of a person on receiving a gift under budget constraints
- Implemented simple genetic algorithm code in Python to find out the contents of the optimum gift

Positions Of Responsibility

Web Manager | Aerospace Engineering Department July'16 - May'17

Aerospace Engineering Association (AEA)

- Designed a website for Aerospace Engg. Association and handled the updation Of Aerospace Department main website
- Organized and managed a department trip of 120+ people to Tikona and conducted Fresher's 2016 department orientation

Coordinator | Techfest July'15 - Dec'15

Publicity and web design department

- Part of team responsible for development of Techfest website & led a team of 6 organizers for smooth execution of the festival

Mentor | RC Plane And Paper Plane Competition September'15

Aeromodelling club IIT Bombay

- Mentored 100+ students in the Paper Plane event and 12 students in the RC Plane event & managed the events with managers

Extracurricular

- Selected for the 50th INTER IIT FOOTBALL CAMP in IIT Bombay December'14
- Played in MUMBAI DISTRICT FOOTBALL ASSOCIATION (MDFA) matches as a goalkeeper September'14
- Completed BMC organized by ABVIMAS, Manali. Achieved a height of 15,700ft and got a best group badge May'15-June'15

Technical Skills

Languages And Tools

- Python, C++, HTML, Javascript, Cuda, OpenMP, MPI, HTML, CSS, JavaScript, R, MATLAB, LaTeX, Vim, Git, Arduino

Softwares And OS

- MS Office, OpenVSP, EAGLE, AutoCAD, SolidWorks, Ansys, Adobe Photoshop, XFOIL, Adobe Dreamweaver, Windows, Ubuntu

Key Courses

Core Courses

- Data Analysis & Interpretation, Aerospace Structural Mechanics, Compressible Fluid Mechanics, Aircraft Propulsion, Design Of Powerplants for Aircrafts, Turbomachines, Engineering Design Optimization, Control Theory, Modelling And Simulation

Interdisciplinary Courses

- Computer Programming and Utilization, Differential Equations, Calculus, High Performance Scientific Computing