

Subham Swastik Samal

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Education

- 2016-2020 **B. Tech**, Indian Institute of Technology Madras, *CGPA – 8.29/10*
Mechanical Engineering
- 2016 **Class XII**, DAV Public School, Bhubaneswar, *Aggregate – 95.4%*
Maths, Physics and Chemistry
- 2014 **Class X**, DAV Public School, Bhubaneswar, *CGPA – 10/10*
Standardised Test Scores
GRE – 325/340; 170/170 (Quant), 155/170 (Verbal), 3.5/6 (AWA)
TOEFL – 112/120, 30/30 (Reading), 27/30 (Listening), 29/30 (Speaking), 26/30 (Writing)

Scholastic Achievements

- 2016 Secured an All India Rank of 950 in JEE Advanced 2016 and All India Rank of 1452 in JEE Mains among 1.4 million applicants
- 2015 Awarded the KVPY Fellowship by the Department of Science and Technology with an All India Rank of 397 among 100 thousand applicants
- 2013 Selected for the NTSE Scholarship programme among 100 thousand applicants

Bachelors' Thesis

- Sep'19 – May'20 ***Cyclic Knee Testing Mechanism***
Guide Professor Sujatha Srinivasan (Dept of Mechanical Engineering, IIT Madras)
- Researched the mechanisms of various polycentric prosthetic knees to devise a unique technique to test their life
 - Innovated a crank rocker based mechanism to simulate the swing phase knee joint movement of a walking gait cycle
 - Modelled the entire setup in Creo; performed kinematic and dynamic analyses using a Lagrangian approach, and chose all the components like the motor, bearings and sensors
 - Performed design optimization to make the system compact, lightweight and energy efficient
 - One of the 4 finalists for the SRI award, awarded for the best Inter-Disciplinary Bachelors Thesis Project

Projects

- Sep'19 – Nov'19 ***Robotic Interception of Moving Objects***
Guide Assistant Professor Satadal Ghosh (Dept of Aerospace Engineering, IIT Madras)
- Modelled a hybrid robot-motion planning by integrating AIPNG navigation technique and PD-type CT tracking
 - Implemented the guidance algorithm in Python and simulated various cases of manoeuvring targets
 - Resulting method had improved accuracy and was faster over conventional tracking methods
- Aug'19 – Dec'19 ***Li-Polymer Battery Casing (Avishkar Hyperloop, IITM)***
Guide Professor Sathyan Subbiah (Dept of Mechanical Engineering, IIT Madras)
- Designed a casing for Li-polymer battery cells that can be pressurized to 1 atm when placed in vacuum
 - Implemented a O-Ring gasket joint for clamping the casing and lid together to ensure minimal leakage
 - Performed FEA of the bolted joints and simulated O-Ring deformation to ascertain design

- Oct'18 – Dec'19 **Self-Navigating Bot**
I-Bot Club, IIT Madras
- Simulated a IR-based robot model to drive it from source to destination and avoid obstacles on the way
 - Developed algorithms for go-to-goal, follow wall and avoid-obstacles behaviour in MATLAB
 - Constructed a data-driven decision making model for automatic transition between the behaviours
- Sep'18 – Nov'18 **Flipper Mechanism**
Guide Associate Professor Ramkumar P (Dept of Mechanical Engineering, IIT Madras)
- Innovated and modelled a mechanism aimed to reduce clogging in wastewater treatment plants using simple machine elements
 - Executed iterative methodologies to design gears, shafts, and select bearings and lubricant
 - Performed fatigue failure analyses and optimized the design to ensure at least 10 years runtime
- Mar'18 – May'18 **Self-Balancing Cycle**
Guide Professor Sathyan Subbiah (Dept of Mechanical Engineering, IIT Madras)
- Conceived the design and manufactured the chassis and flywheel of the self-balancing bicycle
 - Implemented PID control systems by installing Arduino controllers, motor drivers and MPU 6050 sensor
 - Analysed the dynamics of the closed loop system in Simulink to obtain the optimal PID parameters
- Jul'17 – May'18 **The Firmator**
I-Bot Club, IIT Madras
- Ideated and designed a bot to perform basic agricultural processes like soil preparation, sowing and seed firming
 - Designed various components of the robot, chose all the hardware like the microcontroller, sensors and actuators and implemented the code for the controller
 - Assembled the bot and presented the final project during the CFI Open House, IITM 2018
- May'17 – Jan'18 **Projection Mapping**
Team Envisage, IIT Madras
- Spatially mapped 2D videos on to 3D objects using surface maps, thus creating an augmented reality
 - Created a virtual environment in tune with audio and human interaction to give illusions of depth and motion, using an IR Sensor based feedback control system for positioning accuracy
 - Exhibited the project in Shastra 2018, IITM Techfest in front of a live audience of 5000+ people

Course Work

Robotics and Control	Mechatronic Systems, Principles of Guidance of Autonomous Vehicles, Modern Control Theory, Mechanics of Human Movement, Process Dynamics and Control, Automation in Manufacturing, Robotics (NPTEL), Control of Mobile Robots (Coursera), Robotics Specialization (UPenn, Coursera)
Mechanical	Manufacturing Technology, CAD in Manufacturing, Theory of Vibrations, Design of Mechanical Transmission Systems, Materials and Design
Maths and Computer Sc.	Probability, Statistics and Stochastic Processes, Differential Equations, Data Structures and Algorithms in C and C++ (Udemy), Machine Learning (Coursera)

Skills

Programming	C, Python(Libraries: Numpy, Tensorflow), R, SQL, HTML, CSS
Software	MATLAB and Simulink, PTC Creo, AutoCAD, Blender, ANSYS, ADAMS, LabVIEW, Arduino, LaTeX

Professional Experience

- Oct'21 – Present **Assistant Manager, BGMH BU, Flipkart Internet Pvt Limited, India**
- Managing inventory health metrics (Instock, Regional Utilization and Unhealthy reduction) in coordination with inventory planning team and category teams

Associate Business Analyst, BGMH BU, Flipkart Internet Pvt Limited, India

Aug'20 – Oct'21

Big Billion Day 2021:

- Build up 355L units of inventory against 310L target through tactical space and inbound solves, 1.9x growth from Big Billion Day 2020

BAU (Business as Usual):

- Planning manpower and space requirements for all 13 Super-Categories and ensuring sufficient allocation by co-ordinating with the inventory-planning team in order to maintain the inventory DOH
- Driving categories to buy sufficient and high-selling inventory, consistently achieving manpower utilization above the 90%
- Brought down returns from 2.4% to 1.9% from Dec'20 to Sep'21, giving a GMV goodness of ~30L per week by driving new initiatives like Open-Box Delivery and Image-Checks
- Designed automated dashboards using Power BI and Google Data Studio for daily/weekly business reports and repetitive tasks for trend analyse

May'18 - Jul'18

Summer Intern, CMS Engineering Unit, CERN, Geneva

- Instrumented and operated a thermal test setup aimed to improve the cooling efficiency in the CMS Outer Tracker using an eco-friendly CO₂ cooling system
- Programmed a DAQ system to acquire, monitor and store the sensor readings using LabVIEW
- Calibrated the sensors using linear regression and brought down the measurement error to $\pm 0.10^\circ\text{C}$
- Performed the cooling experiment and analysed the results, and subsequently presented the outcomes, providing insights on the CO₂ cooling system

May'19 - Jul'19

Product Development Intern. BharatAgri, Pune, India

- Conceptualised 8 new product features to the pre-existing mobile app for data collection of on-boarding farmers
- Designed wireframes and flowcharts detailing the integration of the new features into the pre-existing app

Extra - Curricular Activities

Jun'17 – Apr'18

Coordinator, I-Bot Club, Centre for Innovation (CFI), IIT Madras

- Worked on a project titled 'The Firmator' which was presented in the CFI Open House
- Managed club inventory and finance, and organised the Manual Robotics Challenge in TECHSOC
- Conducted 6 hands-on sessions on elementary robotics and design topics for freshmen

May'17 – Apr'18

Coordinator, Envisage – Shaastra, Technical Fest, IIT Madras

- Organized India's only student orchestrated techno-entertainment pro show in front of a 5k+ audience
- Responsible for managing club inventory and conducting promotional campaigns for Shaastra
- Invited as a professional artist for technical festivals of other universities for the first time

Jan'17 – May'17

Deputy Manager, Public Relations, E- Cell IITM

- Improved the social outreach of E-Cell, IIT Madras to 3 times by Facebook Marketing techniques
- Executed the first edition of Start-up Intern Fair, inviting 25+ start-ups to provide internships to 60+ students
- Conceptualized and implemented Campus Ambassador Program in 25 colleges across 10 cities

Sports

- Represented the hostel teams for Football and Athletics in inter-hostel championship

Quizzing

- Member of Quiz Club, IIT Madras in my freshmen year
- Won the Aaina Quiz and achieved 3rd position in Philately Quiz (Both State Level)

Others

- Mentored 10 freshmen students pertaining to settling, academics and institute culture as a part of *Saathi*, IIT Madras
- Organizing cultural events for regional festivals like Odia New Year, Utkal Divas etc. as a member of Utkal Association (association for Odia people at IIT Madras)