

Manan Tayal

Final Year, B.Tech Mechanical Eng., IIT Bombay, Mumbai, India

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in in/manan-tayal

CAREER OBJECTIVE

- **Currently seeking to research in the field of my interest** – Robotics and Mechatronic Systems.
- Work with a team where I can apply my knowledge and gain practical and professional experience.
- Start a startup of my own with a research approach and good financials in the field of robotics and automation

EDUCATION

Indian Institute of Technology, Bombay

B.Tech, Mechanical Engineering

Mumbai, India

July 2017 – May 2021

- Cumulative GPA – **9.13/10**

- Awarded an **AP** grade in Solid Mechanics Course for exceptional performance in the course

S.D. Jain Modern School

Senior Secondary School

Surat, India

June 2015 – May 2017

Combined Mathematics, Physics, Chemistry

- Cumulative Percentage – **94%**

S.D. Jain Modern School

High School

Surat, India

June 2013 – May 2015

- Cumulative GPA – **10/10**

SCHOLASTIC ACHIEVEMENTS

- Secured **All India Rank 626** in JEE Advanced 2017 out of **0.17 million** candidates
- Secured **All India Rank 289** in JEE Mains 2017 out of **1.2 million** candidates
- Recipient of the prestigious **Kishore Vaigyanik Protsahan Yojana** Scholarship in 2017
- Among National Top 1% in National Standard Examination in Physics (**NESP**)
- Among State Top 1% in National Standard Examination in Chemistry (**NESC**)

INTERSHIPS AND PROJECTS

Research Internship- Siemens Technology and Services Pvt. Ltd.

Apr'20 - May'20

Indian Subsidiary of one of the largest manufacturing and automation company in the world

- Worked in a team of 2 to control a self balancing bot which can be used to move on even as well as uneven surfaces
- This involved training the bot with different data driven control algorithms like **PID** controller, **Model Free Adaptive** Controller(MFAC), **Simultaneous Perturbation Stochastic Algorithm**(SPSA) Controller, **Iterative Feedback Learning** (IFL) Controller and **Reinforcement Learning** (RL) controller
- Trained and Simulated the bot to move in straight line and turn on different surfaces like flat surface, inclined surface and uneven surface on python library known as **Pybullet**

STRIDE

Aug'19 - Mar'20

Technical team developing an autonomous quadruped for maneuvering through difficult terrains

- Co-Founder of a new technical team with the aim of developing an autonomous quadruped for maneuvering through difficult terrains, named STRIDE
- Worked on the stability of Camera on the bot, while the bot is moving
- Worked on the gait planning (Trot and Bound) and balancing of the bot by open loop control

ABU ROBOCON 2019

Oct'18 - May'19

The ABU Asia-Pacific Robot Contest (ABU Robocon) is an Asian Oceanian College robot competition

Semi Autonomous Quadruped

- Worked on walking mechanism of a quadruped bot by applying concepts of klanns model
- Designed a 4 DoF servo motor based robotic gripper arm and a catapult structure to be mounted on the bot using SolidWorks
- Manufactured bot components using sophisticated machines like CNCs, water jet cutting etc

FORCE CONTROLLED GRIPPER

Sept'19 - Nov'19

Course Project- Design of Mechatronic Systems

- Worked on a force controlled gripper with 3D Printed parts for gripping of deformable objects

LINE FOLLOWER BOT | Electronics and Robotics Club, IIT Bombay

Jan'18

- Assembled a robot in 3 days from scratch with self-manufactured infrared sensors for a competition Line Follower in which we secured first position among 50 teams
- Implemented PID (Proportional Integral Differential) loop to minimize deviation from the line

TUTOR | Toppr.com

Jul'18 - Jun'19

Tutor at toppr.com, India's most comprehensive online education platform for classes 5 to 12

- Solved **1100+** real time subject queries of students, preparing for **JEE** exam through the platform
- **Guided and Mentored** several students in conceptualizing physics topics and sharing tips and techniques to crack the coveted **JEE Mains and JEE Advanced** exams

POSITION OF RESPONSIBILITY

Tinkerers' Laboratory, IIT Bombay | *A 24*7 'Makerspace' for innovators, open to all the students to promote hands on learning experience*

MANAGER

Apr'19 - Apr'20

- Started **Technovation**, wherein students can work on real-life problems with sufficient funds
- Started **Training Sessions** to train students with Standard SOPs for using the equipments in Lab
- Organised **TL Talks** by famous international entrepreneurs, professors and technologists
- Handled **Rs 5 million** funds of Tinkerers' Lab to ensure proper facilities in the Lab
- Compiled an **Apex Manual** for the Tinkerers' Lab and **Collaborated with other Makerspaces** to spread the idea of innovation amongst school students

CONVENOR

Apr'18 - Mar'19

- Conducted a lecture series and interactive sessions by various technology and market experts
- Organized 3 Workshops in the fields of AI, IOT and 3D Printing with 100+ students each
- Single handedly developed and maintained the Tinkerers' Lab's **Website**

ADVANCED TECHNICAL SKILLS & KNOWLEDGE AREAS

- **Programming Language** –C/C++, Java, Python, HTML5, CSS, XML, Django
- **Software and Tools** – AutoCAD, SolidWorks [good], ANSYS[basic], MATLAB
- **Language** - English[fluent], Hindi[fluent]

COURSES UNDERTAKEN

- **Robotics and related Courses:** Engineering Graphics and Drawing, Introduction to Electrical and Electronics Circuits, Microprocessors and Automatic Control, Design of Mechatronic System, Kinematics and Dynamics of Machines, Robotics, Computer Integrated Manufacturing, Intelligent Feedback and Control, Engineering Data Mining and Applications, High Performance Scientific Computing, Textile Machines Design Automation, Computer Aided Simulation of Machines
- **Other Core courses** Fluid Mechanics, Thermodynamics, Solid Mechanics, Strength of Materials, Mechanical Measurements, Manufacturing Processes, Heat Transfer, Industrial Engineering and Operations Research, Applied Thermodynamics, Machine Design, Acoustic Devices
- **Other Courses:** Computer Programming and Utilization, Introduction to Biology for Engineers, Calculus, Linear Algebra, Differential Equations, Introduction to Numerical Analysis, , Economics, Psychology, Environmental Studies, Managing Technological Innovation, Business Fundamentals for Technopreneurs

Extra Curricular Activities

- Volunteer in Second level of **SIH 2019 Hardware Edition** at IIT Bombay Nodal Center
- Completed **2 Semester Course** in **Musical Keyboard** under NSO, IIT Bombay in 2017-18
- Participated in Obstacle Maneuvering Bot **XLR8** and **RC Plane Competition** in 2017
- Was a **Organiser of Pronites** in Mood Indigo, Asia's Largest College Cultural Fest in 2017
- Qualified for **NTSE- Stage2**, with **29th Rank** in Gujarat NTSE Stage 1 in 2014-15
- Was a part of **winning team** in inter house Cricket tournament of S.D.Jain Modern School (2013-14)