Anmol Gupta

B.Tech: Material Science & Engineering
M.Tech: Mechanincal Engineering

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Academic Qualifications

Year	Degree/Certificate	Institute	CPI/%
2018 - Present	BT-MT	Indian Institute of Technology, Kanpur	9.5/10(PG) | 7.34/10(UG)
2017	CBSE(XII)	M.S. School, Tundla	82.4%
2015	CBSE(X)	M.S. School, Tundla	9/10

Technical Skills

- **Programming Languages and Web-Dev:** C++, Python, SAS, OOPs, DSA, HTML, CSS, JavaScript, React, Node.js, Express.js.
- **Software and Tools:** MATLAB, OpenAI Gym, Blender, Unreal Game Engine, Autodesk Inventor, AutoCAD, VS Code, Git, DBMS.
- **OS and Others:** Windows, LaTeX, Word, Powerpoint, Excel, Sensors, Controllers, Actuators, Arduino.

Scholastic Achievements

- **Top 10%**, among the IIT Kanpur students registered on the online coding platform Geeks for Geeks. *2022*
- **Bronze Award,** for DIC's Terrace Farming Robot Challenge in Inter IIT Tech Meet 8.0 by IIT Roorkee. *2019*
- **Best Documented Project Award,** for Fastest Line Follower completed during SnT summer camp, IIT Kanpur. *2019*
- **Best Project Award,** for BIRA under robotics club completed during SnT summer camp, IIT Kanpur. *2019*

Work Experience

Germany Bancons Model - Quant Developer, QA Treasury, Barclays, Noida (*August'23-Present*)
Manager: Rumeet Saluja, VP - QA Treasury, Barclays, Noida

Objective: To reimplement the **Bancos Behavioural Model Calibration** from **SAS in Python language.**

- Understood the **SAS** program designed for Model Calibration and implemented the corresponding logic in **Python** with **enhanced efficiency**.
- Extensively used **Pandas** for managing large datasets, including tasks like data cleaning, filtering, merging, and extracting valuable insights.

Industry4.0 - MTech Thesis Project, IIT Kanpur (*May'22-Dec'22*)
Guide: Nalinaksh S. Vyas, Professor, IIT Kanpur

Objective: To implement **Industry 4.0 solution** first on **simulation** and then on real machines and factories.

- Developed an **HMI application** for employees, the frontend was written in **React-Native** and backend **Rest Api in NodeJs**.
- The HMI app can keep **track of employees** in the factory, the machine and part they were working on, and their exact location.
- A **real-time machine monitoring** application was developed on **LabView** which gave real-time machine data from **Siemens Machines**.
- The app was developed with simulated data from **Siemens Sinutrain** and then checked with a real machine in **Ordnance Factory**,Kanpur.

Drone and Anti-Drone Simulator - Intern, ARTPARK IISC Bangalore (*Jun'21-Feb'23*)
Guide: Vineet Vashishtha, Software Architect, ARTPARK IISC Bangalore

Objective: To build a **drone and a anti-drone simulator** for the purpose of training of drones using **reinforcement learning techniques**.

- **Simulated** a terrain of Galwan valley in **Blender** using **NASA's elevation data** to create a virtual environment for the training of drones.
- Designed & simulated a **drone** in **Blender** & **Unreal Game Engine** using **Python API** to fly it manually in the mountain-valley terrain.
- The drone **dynamics** was simulated with some combinations of thrusts applied on four rotors by keyboard inputs to achieve specific **motion**.
- Simulated the **Anti-Drone Technology** at ATC tower, Bangalore Airport which **shoots** down the invading drones with a **wind blast**.

Key Projects

PARAS (Partly Autonomous Robot for Agriculture in Step Farms) | *Robotics Club, IIT Kanpur* (*Nov'19-Dec'19*)

Objective: To analyze and make a robot for terrace farming solutions over conventional farming for DIC's challenge in Inter IIT Tech Meet 8.0.

- Found a solution for **terrace farming robot** to participate in **DIC's Terrace Farming Robot Challenge** and won **bronze medal**.
- **Designed & fabricated** a prototype of a **four-moduled** machine that was capable of doing all required terrace farming tasks in step farms.
- The design was a primary machine with a **lead screw-based climbing**, harvesting cutter, and combined sow mechanism.
- Programmed data was collected from several **sensors** (6 ultrasonic sensors, soil sensor, IMU, CNC), its **feedback system and PID controls**.

BIRA (Brain Interfacing Robotic Arm) | *GitHub Repo* | *Robotics Club, IIT Kanpur* (*Jun'19-Jul'19*)

Objective: To make a robotic arm and control its movements with the human brain to assist physically challenged individuals.

- Designed & built a **four-parallel bar** linkage-based **Robotic Arm** with 4 DOF and controlled it by **EEG Signals** extracted via **gel electrode**.
- **Recorded a small portion** of the brain EEG signals of **blinks, double-blinks and meditation** with the help of an **EEG Device**.
- The arm joint angles were calculated using **Inverse Kinematics** in **MATLAB** for the given coordinates of the arm gripper in 3D space.
- Used EEG signals to **coordinate the movements** of the arm with calculated angles sent to servo actuators via **Arduino** & **HC05 module**.

FLF (Fastest Line Follower) | *GitHub Repo* | *Robotics Club, IIT Kanpur* (*Jun'19-Jul'19*)

Objective: To make a wheeled line follower bot for traveling from the start to end point on a path autonomously in minimum time.

- Designed & built a compact wheeled bot which can **autonomously** follow black lines using **Line Follower Sensor** mounted below the bot.
- Implemented **PID controller** for stabilization and **Left-Hand Algorithm** to handle the intersections, loops and dead-ends in path.

Self Projects

Web Music Player Application | *GitHub Repo* (*Jun'22-Aug'22*)

- Created a web **music player** to play songs, wrote its frontend with **HTML, CSS & JS** and used browser local storage to store song's data.
- Developed its **backend** based on **Model-View-Controller** architecture with **Node.js, Express.js, Passport.js** and **EJS view engine**.
- Used **Passport-local-strategy** for users **authentication & authorization** and **MongoDB** with **Mongoose ODM** for storing users data.
- **Deployed** the web application using **Heroku** hosting service and connect it to the MongoDB using **MongoDB Atlas cloud database**.

Snake Mania | *GitHub Repo* (*Mar'22*)

- Made a custom training environment inherited from **OpenAI Gym** to train a snake to eat food without dying using **reinforcement learning**.
- **U**sed **Pygame** library for rendering the **training environment** window, the snake movements and the food while training.

Position of Responsibility

Senior Executive, Media and Publicity, Udghosh'19 (*Jun'19-Sep'19*)

- With 2 head & 4 senior executives, lead a **team of 24 people** & a **coverage team** and conduct **professional talks, shows and a press conference**.

Secretary, Robotics and Photography Club, IIT Kanpur(*Mar'19-Mar'20*)

- **Assisted** coordinators and mentored freshers in different organized club events, lectures, workshops, competitions and in college festivals & Inter IIT Meet.

Extra-Curricular Activities

- **Junior Executive** in **Ritambhara**, and in **Media and Publicity cell**, Antaragni'18, IIT Kanpur.
- Did a **photoshoot** for Online Modelling Competition in Inter IIT Cult Meet 4.0 and secured **sixth position**.
- **Volunteered** in **Unnat Bharat Abhiyan** and made **photostory blogs** for their social media page.