

# Arnav Bajaj

arnavbajaj9@gmail.com | arnav-bajaj.com | <https://github.com/Jackhammer9>

## Skills

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**Programming Languages:** Python, C++, C#, JavaScript, Matlab

**CAD:** Autodesk Inventor, Solid Works, Blender

**Machine Learning:** Tensorflow, PyTorch, Scikit-learn

**Computer Vision:** OpenCV, Mediapipe, OptiTrack

**Parallel Computing:** CUDA, cuDNN

**Robotics:** ROS, RoboDK

**Electronics:** Altium, LTSpice, Arduino

**Web Development:** HTML, CSS, React, Django, Three.js

**Game Development:** Unity Engine, Pygame, Bosca Ceoil, Unreal, Aesprite

**Tools:** Git, GitHub, LaTeX

## Projects

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### Gyroscope and FSR Controlled Car: Sperry

- **Objective:** Create a robot controlled by wearable sensors (FSR + gyroscope) on the user's hand.
- Engineered a four-wheeled vehicle with Bluetooth communication for responsive, low-latency control.

### Drone Project: Nimbus

- **Objective:** Develop a custom drone, including both flight controller and external controller.
- Built and programmed the Arduino-based flight controller featuring a PID loop to maintain flight stability.

### Computer Vision: Hand gesture detection based video game controller

- **Objective:** Implement gesture-recognition to replace traditional game controllers.
- Used OpenCV and Mediapipe to identify multiple hand gestures with **85% accuracy**.
- Integrated gesture inputs into a Unity game prototype, increasing accessibility and immersion.

### Open Source Python Library: RedDownloader

<https://github.com/Jackhammer9/RedDownloader>

- **Objective:** Develop an open source downloader made for the reddit that enables user to download all media types in pristine quality.
- Gained **85+ GitHub stars** and currently averages **1,000 monthly downloads** on PyPI.

## Experience

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### Web Automation Freelancer – Freelancer at Upwork.com

January 2021 – May 2022

- Provided social media automation and solutions to multiple clients, reducing manual workload by up to **75%**.
- Devised a safety algorithm for Twitter accounts that mitigated bot attacks and secured profiles with a detection rate of **94%**.

## Extracurricular

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### Astra Robotics – Member

September 2022 – May 2023

- Was an integral member of the Astra Robotics Club, Collaborated on the HAL logistics robot project
- Revamped the club website using Three.js and ReactJS, improving load times and user experience.

## Education

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### Technische Hochschule Würzburg-Schweinfurt – B.Eng in Robotics Engineering

Graduation: March 2027

- Developed a line follower robot, learnt camera calibration, simulink, soldering, machine vision algorithms and navigation algorithms through various Robotic Labs.