

Arnav Bajaj

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Education

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

Graduation: March 2027

- **Notable Courses Taken:** Machine Learning, Navigation for mobile robots, Robot Mechanics, Systems Theory, Image Processing
- **Notable Labs:** Line Follower Robot, Camera Calibration, Simulink

Experience

Student Research Assistant – Julius Maximilians Universität Würzburg

Feb 2025 – Present

- Developed a pipeline for psychology students integrating virtual meta humans with realistic facial expressions.
- Designed a learning/teaching tool using **Unreal Engine** and **Meta Humans** to enhance student engagement and understanding.

Web Automation Freelancer – Upwork.com

Jan 2021 – May 2022

- Automated social media processes, reducing manual workload by up to **75%**.
- Created a bot attack detection algorithm for Twitter, reducing bot attacks on client accounts by **94%**.

Projects

Alzheimer's Detection CNN

<https://github.com/Jackhammer9/Alzheimer-CNN>

- Built a deep learning model using CNNs for detecting Alzheimer's stages from MRI scans.
- Evaluated the model with accuracy, precision-recall curves, and a confusion matrix, achieving a precision of **70%** and a recall of **62%**.

Car Price Predictor

<https://github.com/Jackhammer9/Car-Price-Predictor>

- Built an **ML pipeline** for car price prediction with feature engineering & multiple regressors.
- Optimized hyperparameters using **GridSearchCV**, with R^2 score of **84%**.

RedDownloader (Open Source Python Library)

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

- Developed an open-source Reddit media downloader to download content in pristine quality.
- Gained **90+ GitHub stars** and averages **1,000+ monthly downloads** on PyPI.

Drone Project: Nimbus

- Designed a custom drone with an Arduino-based flight controller.
- Implemented a PID loop to maintain flight stability.

Gyroscope and FSR Controlled Car: Sperry

- Created a robot controlled by wearable FSR and gyroscope sensors.
- Engineered Bluetooth-based communication for low-latency control.

Way to the Veil

- Developed a fast-paced ninja-themed 2D action game with dynamic combat mechanics.
- Implemented enemy AI and boss fights mirroring player abilities.

Skills

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

Machine Learning: Tensorflow, PyTorch, Scikit-learn

Computer Vision: OpenCV, Mediapipe, OptiTrack

Robotics: ROS, RoboDK

Game Development: Unity, Pygame, Unreal, Aesprite

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

Electronics: Altium, LTSpice, Arduino

Tools: Git, GitHub, LaTeX

Extracurricular

Astra Robotics – Member

Sep 2022 – May 2023

- Contributed to the HAL logistics robot project.
- Redesigned the club website using Three.js and ReactJS.