

Arnav Bajaj

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Education

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

Graduation: March 2027

- **Relevant Courses Taken:** Machine Learning, Deep Learning, Navigation for Mobile Robots, Robot Mechanics, Systems Theory, Image Processing
- **Relevant Labs:** Line Follower Robot, Camera Calibration, Simulink, ROS, Rapid Control Prototyping

Experience

SDV Intern – Audi AG

Oct 2025 – Present

- Built AI-powered internal tools leveraging large language models to streamline and automate multiple aspects of the development workflow.
- Developed innovative, stylized Android HMI that served as the primary interface for showcasing and demonstrating new internal features.
- Programmed a Vehicle App Development Kit enabling UI designers to test and validate designs in a live Android environment without writing any code.

Student Research Assistant – Julius Maximilians Universität Würzburg

Feb 2025 – Aug 2025

- Developed a modular, Python-based pipeline integrating Unreal Engine and MetaHumans to support interactive learning for psychology students.
- Engineered a real-time phoneme-to-viseme lip sync system using speech input and phoneme alignment to animate a large language model driven MetaHuman character.

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

BrainDance (*Research Project*)

- Received a funding of €7,500 from VDI to develop a classifier with the ambitious goal to enable EEG semantic decoding as well as tackle the problem of generalization.
- Already achieved the milestone of classifying eye state based on EEG Brain Waves
- This model is planned to be implemented in prototypes to develop mobility solutions for the disabled.

Reduino (*Free and Open-Source*)

github.com/Jackhammer9/Reduino

- Architected a Python-like domain-specific language (DSL) that transpiles into statically-typed C++ for MCUs
- Implemented custom parser, AST generation, type inference, and code emission pipeline
- Automated PlatformIO project generation, board validation, and firmware build/upload workflow
- Achieved **120+ GitHub stars**, demonstrating community adoption and impact

Nimbus Drone

- Developed a flight controller prototype for the self engineered Nimbus drone
- Implemented thrust control using dual Arduino micro-controllers and Radio-based communication
- Integrated IMU (MPU6050) for real-time orientation sensing and manual stabilization

Gyroscope and FSR Controlled Mobile Robot: Sperry

- Created a mobile robot controlled by a controller wearable on the wrist which is made up of FSR and gyroscope sensors.
- Bluetooth-based communication for low-latency control.

RedDownloader (*Free and Open-Source*)

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

- Designed and implemented a custom downloader utility to automate large-scale data retrieval and organization.
- Built a robust pipeline handling retries, failures, and structured storage of downloaded assets.
- Focused on efficiency, reliability, and extensibility for repeated internal use.
- Gained **120+ GitHub stars** and averaged **1,000+ monthly downloads** in PyPI.

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%**.

Skills

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

Machine Learning: Tensorflow, PyTorch, Scikit-learn

Computer Vision: OpenCV, Mediapipe, OptiTrack

Robotics: ROS, RoboDK, Simulink, Simscape

Game Development: Unity, Pygame, Unreal, Aesprite

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

Electronics: LTSpice, Arduino

Tools: Git, GitHub, LaTeX, Docker