Ayan Syed

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Projects

EEG Neurofeedback Powered Study Assistant

- Real-time brain activity monitoring system utilizing OpenBCI Cyton and Stanford University Fast Fourier Transform (FFT) data algorithm to extract insightful Delta, Alpha, Beta, Theta, and Gamma brainwave patterns, aimed at helping the ADHD and student community for more focused & efficient study sessions.
- Engineered data filtering pipelines (Bandpass, Low/High Pass Filters) and a PyTorch Neural Network for accurate classification of concentration levels and distraction events.
- Integrated Gemini to generate personalized feedback, and made Swift UI featuring a dynamic study timer

Skills: Data Structures, Multithreading, Data Processing, Machine Learning, Swift UI/UX, Google Gemini, Digital Signals(DSP)

Gemini Robotic Arm

- Custom Open-Source 5DOF 3D-Printed Robotic Arm Platform. Utilized OpenCV to find, classify, and locate objects, then used Gemini API to generate smart manipulation commands using voice inputs
- In Python & C++, wrote custom Robot Controller, trapezoidal profile, and URDF for precise motor control

Skills: Google Gemini, Python, C++, NLP, Computer Vision/Homography, 3D Printing, Onshape, JSON, Kinematics, ROS, CAD

Autonomous RC Car Racer

- Attached Raspi 4B, Arduino, and USB Camera to my little brother's old RC Car and used NVIDIA Isaac ROS VSLAM to perform localized Camera-based SLAM with IMU. Achieved <5cm Precision
- Currently integrating ROS Nav2 and Pure Pursuit for autonomous navigation and route planning

Skills: ROS2, Python, C++, SLAM, Computer Vision, Autonomy, Sensor Fusion, Robotics, CAD/3D Printing, Data Processing

CometKitz

- Designed embedded firmware (Arduino, C++), custom circuit boards (KiCAD) and Blockly interfaces to develop a novel low-cost robotics education platform non-profit to inspire grades 4-8 to STEM.
- Presented and networked with industry and local government to secure over $10K in R&D/execution funding and taught at 11 schools for free, educating 200+ South Bay students. Featured on NBC Bay Area

Skills: Arduino, C++, Blockly, Board Design, Embedded Systems, Rapid Prototyping, Product Design, Project Management

Experiences

NASA L'SPACE Program   *Winter 2024 - Simulation & Applications Software Team*

- Developed FEA, MATLAB, and physics simulations on composite behavior under Titan/Venus conditions
- Wrote Python Matplotlib scripts for testbed rig used for degradation and efficiency data acquisition
- Collaborated with a 12-member research team to co-author a TRL 2 technical proposal on basalt-aerogel adoption for extraterrestrial habitation thermal and protective capacities

NASA AMES Research Center   *Summer 2023 - Data Research Intern*

- Partnered with 2 NASA data engineers to collect and preprocess large open-source fuel emission datasets
- Developed effectiveness constants to evaluate the scalability of high-KV electric thrust systems for commercial long-distance aviation. Co-authored alternative fuel technical paper; Published on N.T.R.S.

FTC Team 8872 Robpocalypse   *2024 Team Captain & 2023 Technical Lead*

- Led team to the top 1% in NorCal Region and qualified for & competed at the 2024 World Championship

Education

De Anza College   *Computer Science - Class of 2028 - 4.0 GPA*

- Data Structures & Algorithms, C++ & Python Series, Circuit Design, Object-Oriented Programming, x86 Processors

Skills

Languages/ Frameworks: Python, C++, JavaScript, OpenCV, NumPy, Swift, PyTorch, API, MATLAB, Assembly Language
Tools: Linux, Github, Unity3D, Blender, ROS2, Pandas, MatPlotlib, JSON, Gemini AI, Embedded Systems, Arduino
Other: Vector/Multivariable Calculus, Product Design, URDF, 3D Printing, KiCAD, PCB, Circuits, CAD, Debugging