SHAUN JOE ROY

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About me

Software engineer with an understanding of software architecture and system-level engineering, with a keen interest in computer architecture and OS-level engineering. Experienced in embedded systems, real-time applications, sensor fusion via standard communication protocols, and direct memory access. Proficient in deep learning, autonomous systems, and GPU-accelerated computing. Background in aerospace defense, including missile simulation and mission planning.

Experience

Total Experience - 1.4 years

Application Engineer 1, *LTX LaunchTrax*

Jan 2025 - Present
Bangalore, Karnataka

- Implemented embedded communication protocols (I2C, SPI, UART) for real-time sensor fusion and data acquisition from IMUs and pressure sensors.
- Optimized PID control algorithms and evaluated STM32 vs. BeagleBone platforms for performance and system integration. Leveraged DMA to accelerate real-time data transfer from sensors, improving data collection speed.
- Developed dynamic system models and guidance algorithms using SIL testing in Gazebo/ROS for autonomous vehicle simulations.
- Worked on compute-intensive numerical algorithms for missile simulation and electronic warfare (EW) triangulation.
- Worked on frontend design and backend functionality to make the system more intuitive and pilot-friendly.
- Improved render pipeline using code analysis, reducing scenario generation time by ~60%.
- Improved CI/CD pipelines to enhance build reliability and deployment efficiency.

Application Engineer Intern, *LTX LaunchTrax*

Oct 2024 - Jan 2025

- Built and integrated scalable, optimized code for cross-platform development, including embedded devices and GPS navigation systems (using Honeywell HGuide n380).
- Worked on Mission Planning and Debriefing Software for Tejas MK1A fighter jet.
- Simulated GPS navigation scenarios, emphasizing shortest path algorithms and rerouting using statistical methods.

Education

Nov 2020 - Nov 2024

B.Tech Computer Science and Engineering

Presidency University

- Thesis on "Advanced Heart Health Assessment through Machine Learning Using KNN Algorithm".
- Relevant coursework in Machine Learning and Statistical Methods.

Projects

Image-Based Search Engine | *Microsoft Azure, Flask, LLMs*

- The Image-Based Search Engine project allows users to upload images, which are then analyzed for descriptive tags using Azure's Computer Vision service, the system searches for similar images in an Azure Search Index and displays results, including images and their descriptions, to the user.

Expert AI Healthcare System | *Python, Gradio, PyTorch*

- Led the team that developed a sophisticated machine-learning application for assessing heart health that used the KNN (K-Nearest Neighbours) algorithm.

ForageDB | *Qt/QML, Algorithms, System Design*

- A Simple Relational Database implementing the CRUD functionalities.

Technical Skills

Languages: C/C++, Python, Java, C#, Bash, arm assembly, Swift, Scala
Frameworks & Libraries: Qt/QML, Pytorch, TensorFlow, OSG, VSG, SIMDIS, Django, Flask, Spring Boot, JavaFX, Node.js, Metal, Microsoft Azure, Bare Metal Programming (arm-a53), vcpkg
API: Vulkan, CUDA, OpenGL, ImGui
Others: Gazebo, Docker, ROS, Linux, Design Patterns (Embedded and Software), CI/CD, NSIS, xSimd
Protocols: TCP/IP, UDP, GRpc, I2C, SPI, UART, HTTP

Languages

English: Proficient, **Malayalam**: Native, **Hindi**: Proficient, **Kannada**: Intermediate