

SHASHWAT RAJ

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Education

Arizona State University

2023-2027

B.S.E. in Computer Systems Engineering + B.S. in Mathematics (Dual Major), GPA : 3.78/4.0

Tempe, Arizona

Activities : GCSP, Venture Devils, ACM@ASU, Hacker Devils, Fulton Undergrad Research Initiative (FURI), LENS lab
Awards : Dean's List Fall'23, Spring'24, Spring'25; NAMU Scholarship \$13500/yr; 2024-25 Go-Global Scholarship of \$3000

Technical Skills and Other Interests

Languages: Python, Typescript, Java, C, C++, LaTeX, GoLang, CUDA, Lua, R, Matlab, Bash, Verilog, VHDL, MIPS Assembly, React, Node, Express, Rust

Technologies/Frameworks: PyTorch, OpenCV, Keras, Scikit Learn, Pandas, Git, GitHub, Tensorflow, AWS, XGBoost, Numpy, Matplotlib, KiCad, IoT, ROS, Seaborn, Gazebo, OpenGL, OpenCL, CARLA, TCP/IP, Kafka, Airflow

Hobbies: Flute, Battlebots, Boxing, Digital Art, Comp. Prog., Cricket, Basketball, Chess, Podcast host of "Write It Out"
Other Courses & Certifications listed on LinkedIn, Personal website

Experience

Collective Design (CoDe) lab, Arizona State University

May 2024 – Present

Machine Learning Developer and Researcher

Tempe, Arizona

- Developing Reinforcement Learning techniques to optimize Earth science missions to autonomously determine priority observations in space, under the mentorship of Dr. Paul Grogan of SCAI Faculty at ASU.
- Co-authoring a review paper discussing relation between OSSEs & Mission Engineering.
- Trained DQN and QRDQN models using Pytorch, GeoPandas, TAT-C, Seaborn on NASA's Geos5 dataset, achieving 67% precision and 87% recall resp. Receiving total \$4600 through FURI and GCSP Research funding.

MentorU

July 2025 – August 2025

Product Development Manager

Los Angeles, California

- Managed/Led a team of 5 developers developing a full-stack online platform for college admission counseling startup, to automate features like scholarship finder and personal story-building. Increased UX Research success by 150%.

Team Inferno, Delhi Technological University (DTU)

December 2022 – February 2023

Systems Engineer

New Delhi, India

- Developed custom PCBs on Allegro for incorporating embedded systems on-board the prototype Mars Rover for University Rover Challenge (URC). Programmed perception and navigation systems using ROS, OpenGL and SLAM on Python, along with various other system simulations on Gazebo.

Projects

Embedded Robotics | Low-level C, Embedded Microprocessor Systems

Present

- Used the FRDM-KL46Z NXP microprocessor board with C to control a robot, to move in a figure-eight pattern, follow a line, avoid obstacles, and navigate through a colored maze, after configuring GPIO registers, interrupts, encoders and utilizing components' datasheets, PID tuning and I2C, SPI and UART communication protocols.

KCAVO | Kubernetes, KubeCTL, GoLang, GPU Inference | github.com/darthvader58/kcavo

October 2025

- Kubectl plugin that analyzes Kubernetes clusters to visualize resources, estimate costs, and give optimization insights directly from the CLI. It supports multi-namespace analysis, structured outputs (JSON/YAML), GPU usage tracking, enabling SRE and DevOps teams to quickly identify inefficient resource usage.

Formath | React.js, Node.js, Express.js, Figma, CockroachDB, AWS | formath.vercel.app

October 2023

- A web app that analyzes step-by-step math solutions from uploaded images, identifies errors, and provides feedback. Integrates Mathpix for LaTeX conversion, WolframAlpha for analysis, and Imgur API for OCR, ChatGPT for feedback and supporting a proper CI/CD system via AWS EC2 and S3 buckets.

pip-race | Rust, Redis, ONNX, Docker, PyTorch, Express, React | github.com/darthvader58/pip-race

October 2025

- A real-time F1 race strategy system using QRDQN to predict pit-stops (0.87 AUC-ROC) and a Rust-based ML inference, delivering sub-50 ms latency, with live telemetry via dockerised WebSockets and Redis CLI, trained on FastF1 data.

Mean Bean Machine | Linux, SystemVerilog, FPGA, Vivado | github.com/darthvader58/MeanBeanMachine

November 2025

- An FPGA implementation of the famous retro game - Dr. Robotnik's Mean Bean Machine. Programmed on NEXYS A7100T board using AMD's Vivado, using 5 control switches, a VGA output for game screen and 7-segment display for viewing the score.

ML From Scratch | Python, Numpy | github.com/darthvader58/Machine-Learning-From-Scratch

June 2025

- SVM, K-Means, Mean-Shift and Neural Networks Models made from Scratch using Numpy and Python, with a small portion using Pandas and Scikit-Learn's sklearn.preprocessing for Data Cleaning, indicating fundamental understanding and expertise in the math behind supervised and unsupervised learning algorithms

Other Projects and Publications listed on Github profile, LinkedIn and Personal Website