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 & Leadership : Vice President at Hacker Devils, Ex-Technical Director & Officer at ACM@ASU, Ex-Student Rep for GCSP@ASU, DevilQuant, Venture Devils, EPICS@ASU Project Leader, Ex-Engr. Futures Mentor, Section Leader for ASU101 F24

Academic Awards & Scholarships : Dean's List F23-F25; NAmU Scholarship $13500/yr; SP25 Go-Global Scholarship $3000

Experience

Collective Design (CoDe) lab **May 2024 – Present**

Machine Learning Developer & Researcher *Tempe, Arizona*

- Developing **Reinforcement Learning** techniques to optimize Earth science missions to autonomously determine priority observations, under **Dr. Paul Grogan**. Co-**authoring** a review paper on intersection of **OSSEs** & **Mission Engineering**.
- Trained **DQN** & **QRDQN** models using **PyTorch**, GeoPandas, TAT-C on **NASA's G5NR dataset**, achieving **67.00% precision** & **87.00% recall**. Receiving total **$6200.00** through FURI & GCSP Research funding.

Expeditise LLC. **July 2025 – August 2025**

Cloud Applications Developer intern *Phoenix, Arizona*

- Developing **AWS + Cloudflare** infrastructure to scale Pinluma's collaborative art platform toward **10K+ concurrent** users.
- Building real-time state synchronization & asset delivery targeting **30%** lower collaboration **latency** across shared workspaces.

WoofCare Solutions Pvt. Ltd. **May 2025 – Present**

Founder *New Delhi, India*

- Building a **Flutter + Firebase** app connecting common dog lovers with NGOs, vets, shelters, and adopters for stray dog care.
- Designed **Firebase** Auth, **Firestore** schemas, NGO profiles, donation workflows, and **location-based discovery**; secured **EPICS@ASU funding** and partnerships with **60+ NGOs** undergoing massive **beta testing** in Pune, India.

Projects

AI Privacy Firewall | *FastAPI, React, TypeScript, Gemma 4, Supabase, Transformers, D3.js, DistilBert* GitHub

- Asclepius is a clinical **AI privacy platform** that uses **neural-guided semantic proxy** to let pharma & clinical teams safely query latest remote **LLMs** like **Anthropic Claude Opus** & **OpenAI GPT5.5** without exposing **sensitive data**.
- It strips **18 HIPAA identifiers**, enforces a **DP budget**, & rehydrates answers locally so **zero raw PHI** reaches the cloud; tested **5 adversarial attack cases** on **50 documents** with **86% task utility**, & won **HackPrinceton'26 Best Overall** with **$1150.00** in prizes.

INDU: Intelligent Network and Data Unit | ***Voice AI, Speech/Intent Processing, Safety Systems, Browser Agents*** GitHub

- Developing a **voice-controlled edge AI operator** that combines **wake-word interaction**, personalized **speech/intent processing**, **safety rules**, progress reporting, and **headless AI-browser execution** through a phone-facing approval surface.
- Designing the system around explicit user **confirmation**, **cancellation**, and **result reporting** so asynchronous browser actions remain observable, interruptible, and aligned with user intent. Building an **embedded connectivity** stack, Meta glasses SDK and low-power Bluetooth/Wi-Fi links for persistent phone **tethering**.

Kubernetes Cost Analyzer CLI | *kubectl, Go / GoLang, Bash, Cobra, Viper, clientcmd* GitHub

- KCAVO is a **kubectl plugin** that inspects live cluster state via **client-go**, projects monthly CPU, memory, GPU, & storage spend using a **730-hour billing model**, supports **JSON/YAML/table exports**, & flags waste patterns such as pods over **4 vCPU**, memory requests over **16GB**, GPUs above **70% of pod cost**, & **30-50% downscaling** savings opportunities in SRE workflows.

F1 Algorithmic Strategy Game | *Next.js, Compiler Design, Pixi.js, PyDantic, Uvicorn, Docker, WebSockets* GitHub

- A multiplayer game where players write **Python pit-stop algorithms** competing in a **physics** based F1 **simulation**. Built a race engine, modeling tyre degradation cliffs, **Markov-chain weather**, safety cars, DRS, **sandboxed code execution**, **ELO matchmaking**, **6 adaptive AI bots**, & **real-time** race visualization using **8,500+ LOC** & **21 API** endpoints.

Other Projects & Publications listed on GitHub profile, LinkedIn & Portfolio Website

Technical Skills & Other Interests

Languages: Python, Java, C/C++, TypeScript, JavaScript, Go, Swift, Rust, SQL, Bash, Verilog, CUDA, Metal, Ruby, Objective C
Frameworks: React, Next.js, FastAPI, Flask, Node.js, Flutter, Tailwind, Firebase, Supabase, Xcode, Android Studio, SwiftUI
ML/Data: PyTorch, TensorFlow, scikit-learn, pandas, NumPy, Hugging Face Transformers, spaCy, mlx
Systems/Cloud: Docker, Kubernetes, Linux, AWS, MongoDB, Git, GitHub, Redis
Hardware/Embedded: SystemVerilog, Vivado, Xilinx FPGA, KiCad, Arduino, Embedded C, RTL Design
Open-Source Contributions: Mocha JS, Electron JS, Pixi JS, Keras, Kubernetes, Supabase, OMI AI hardware
Side Interests: Competitive Programming, Hackathons, Algorithmic Trading, Datathons, Chess, Idea Pitching, Battlebots, Pololu Micromouse