

# Kiruthika Marikumaran

925-967-7432 | kiruthika.star14@gmail.com | linkedin.com/in/kiruthika-star14 | github.com/kirustar14

## EDUCATION

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### University of California San Diego

B.S. Computer Engineering (Jun 2025); M.S. Intelligent Systems, Robotics & Control (Mar 2027 - Expected)

3.7 GPA

## EXPERIENCE

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### Cofounder | BLEprint – Blackstone LaunchPad, UCSD

Sep 2025 – Present

- Leading the design and implementation of a multi-image capture and 3D reconstruction system, applying 2D-to-3D computer vision methods and iterating the product from early embedded-CV prototypes to full building-scale mapping through user testing and mentor feedback.
- Developing an integrated hardware-software system using safety glasses for standardized image capture, enabling consistent geometry, reliable reconstruction, and real-world usability.
- Architecting scalable pipelines with FastAPI, React, and cloud services for image ingestion, processing, automated 3D reconstruction, and interactive visualization tools.

### Technical Engineering Intern | Atreyus

Jun 2025 – Aug 2025

- Contributed to a contextualized RAG pipeline combining Qwen 0.6B embeddings, BM25 matching, and cross-encoder reranking, achieving 92.62% retrieval accuracy on a public benchmark.
- Designed an adaptive PDF chunking system for text, tables, and images, improving embedding precision and enabling robust handling of diverse document formats.
- Deployed admin-facing features across frontend and backend (workflow deactivation, user reassignment dropdown), streamlining operations and improving system reliability.

### Research Assistant | ProtoLab & HXI Lab, UCSD Design Lab

May 2025 – Dec 2025

- Led full-stack development of a design-flow system with 15+ production features, including AI-driven image generation, dynamic graph visualization, and real-time attribute management, validated through testing with 20 users.
- Engineered scalable backend and frontend systems with TypeScript, React Flow, Firebase, and GPT-5/Image APIs, implementing matrix-based design variation, advanced node/edge management, and multi-mode workflows.
- Developed an AR navigation system using Unity and Meta Quest, integrating real-time 3D obstacle detection, gesture controls, and spatial audio to improve navigation accessibility for low-vision users.

### Lead Developer (since Jun 2025) | E4E Research Lab, UC San Diego

Sep 2024 – Dec 2025

- Spearheaded development of a ground control station dashboard for transitioning from drone-based wildlife tracking to a tower-connected radio telemetry system, improving monitoring scalability and reliability.
- Designed real-time data visualization tools using React and Python to track RF signal activity, animal movements, and tower health, enhancing situational awareness across distributed telemetry nodes.

## PROJECTS

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### Late Afternoon Momentum Prediction | Python, XGBoost, ML

Apr 2025 – Jun 2025

- Developed a machine learning trading bot using XGBoost to predict stock price direction in the 4–5 PM window, achieving up to 79.7% directional accuracy on Costco in minute-level simulations.
- Implemented momentum, volume, trend, & volatility features with data leakage prevention, validated on multiple stocks (Apple, Nvidia, Google) achieving stable 60–66%+ accuracy and low prediction errors.

### Study Spark | React, FastAPI, LangChain, OpenAI, FAISS, PyMuPDF

May 2025 – Jun 2025

- Designed full-stack educational platform enabling real-time Q&A and quiz generation from PDFs by chunking into 500-character sections & retrieving the 6 most relevant context pieces for accurate responses.
- Programmed a multi-agent system with 3 specialized components handling parsing, semantic indexing, and dynamic response generation, supporting customizable quizzes across multiple difficulty levels and formats.

## TECHNICAL SKILLS

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**Languages / Frameworks:** Python, C/C++, Java, TypeScript, SQL, React, Node.js, FastAPI, PostgreSQL, MongoDB

**AI / ML / Tools:** TensorFlow, PyTorch, Hugging Face, LangChain, Scikit-learn, Git, Docker, AWS