

# Ritvik Rangaraju

rrangara@terpmail.umd.edu • (609) 921-4921 • linkedin.com/in/ritvik-rangaraju

## EDUCATION

### University of Maryland - College Park

Bachelor of Science in Computer Science, Minor in Technology Innovation Leadership

College Park, MD

August 2022 – May 2026

**Coursework:** Multimodal Deep Learning, Cloud Computing, Computer & Network Security, Computer Vision, Database Design, Machine Learning, Computational Photography, Advanced Data Structures, Compilers

**Extracurriculars:** *Trip Leader @* Adventure Program (Hiking, Backcountry Camping, Backpacking, Caving, Kayaking),  
*Resident Assistant @* Department of Resident Life, *Photographer @* Indian Student Association

## PROFESSIONAL EXPERIENCE

### Amazon Web Services

May 2025 — August 2025

Software Development Engineering Intern

Seattle, WA

- Engineered zero-downtime update system for a managed database service, implementing rolling updates to avoid cluster-wide outages, improving availability from 95% to 99.9% – directly impacting 60+ enterprise clients across 10,000+ clusters.
- Designed batched update architecture that parallelizes node updates, reducing downtime from 15 minutes to <30 seconds per node and decreasing system overhead by up to 35%.
- Reduced on-call burden by 20%, saving 150+ developer hours annually by preventing update-related production failures that previously caused 120+ customer tickets quarterly.

### Peraton Labs

June 2024 — August 2024

Software Engineering Intern

Basking Ridge, NJ

- Created an autonomous deep learning model training system for active tactical assets, improving location and network status prediction accuracy by 20%, providing operators with high-fidelity data and insights to support real-time mission planning.
- Implemented a model re-training framework that continuously updates an asset's on-device model in real time using live feature, topographical, and meteorological data, reducing long-term predicted path deviance by 15%.
- Developed a compact, high-efficiency model serialization framework that reduced storage size by 40% and inference latency by 25%, enabling high-performance deployment on resource-constrained edge devices with minimal system footprint.

### SEQ Technology

May 2023 — August 2023

Software Engineering Intern

New York, NY

- Built a natural-language analytics tool that converts plain-English business questions into specialized SQL queries for client data warehouses using a database schema-aware RAG layer, reducing analyst turnaround time by 45%.
- Fine-tuned the FLAN-T5 LLM on healthcare/banking terms and entity extraction, improving conversion accuracy by 25% and raising one-shot task success to 85% via an active-learning loop from user edits.
- Delivered full-stack solution: React frontend, Express API gateway, FastAPI ML microservice, and BigQuery query execution.

## PROJECTS

### PassDrop | React, Express.js, WebCrypto, WebAuthn, AWS (App Runner, DynamoDB, CloudWatch)

February 2025 — March 2025

- Built a passwordless, end-to-end encrypted file sharing web app with client-side AES-GCM encryption, with keys generated entirely in the browser and kept in the URL fragment, only storing ciphertext and metadata in the backend.
- Implemented passwordless sign-in with WebAuthn passkeys for link owners and private link access for recipients, with features including timed link expiry, one-time downloads, and sender-controlled at-will revocation.
- Deployed a stateless API on AWS App Runner along with CloudWatch alarms for throughput, error rate, and storage usage.
- Added auditable, idempotent operations to prevent duplicate links and partial writes, tracking file metadata via DynamoDB.

### Pulsar Classification with GAN-Augmented Hybrid CNN-LSTM Models

April 2024 — May 2024

- Built on the work of Connor et al. (2018) by developing a hybrid deep learning model using CNN and LSTM architectures to classify a wide variety of Pulsars – a type of Neutron star – based on signal information.
- Utilized GANs to generate synthetic data for underrepresented pulsar classes, significantly balancing the dataset and improving recall for those classes by 25% through augmented data.
- Applied various noise reduction techniques, reducing false positives by 15% and achieving an overall accuracy of 92%.

## TECHNICAL SKILLS

**Programming Languages:** Java, Python, C, JavaScript, Rust, OCaml, Racket, Bash, Assembly, SQL, MATLAB

**Libraries & Frameworks:** TensorFlow, PyTorch, OpenCV, NLTK, Pandas, React, Express.js, Flask, Django

**Tools & Web:** Git, Docker, Kubernetes, Linux, Node.js, MongoDB, PostgreSQL, AWS: Lambda, S3, EC2, DynamoDB