ANINDA GHOSH

+1(623) 283 8611 | Tempe, AZ | aghosh57@asu.edu | linkedin.com/in/aninda-ghosh | github.com/aninda-ghosh

EDUCATION

MS. in Robotics & Autonomous Systems (AI), Arizona State University — **May 2024**
B.Tech in Electronics & Communication Engineering, West Bengal University of Technology — **2012 - 2016**

TECHNICAL SKILLS

- **Languages / Frameworks:** Python, C/C++, PyTorch, JAX, PyTorch Lightning, scikit-learn, NumPy, Pandas, OpenCV
- **Data Analysis / Processing:** PySpark, Distributed Systems (Big Data Systems), Data Visualization (Streamlit)
- **Cloud Computing / DevOps:** AWS, Azure, Docker, Docker Swarm, Git, Kubernetes, Apache Airflow
- **Embedded Systems:** GDB, Embedded C, RTOS, SPI, I2C, BLE, JTAG, ARM M4/M0+ Socs, AVR, Embedded Linux

PROFESSIONAL EXPERIENCE

Graduate Research Assistant, Arizona State University — **May 2023 - Present**

- Improved remote sensing model accuracy by **34%** using text prompts and semi-supervised learning.
- Boosted field boundary segmentation IoU by **22%** with transfer learning on **ViT** Networks using **DDP** training strategies.
- Co-created satellite imagery **benchmark dataset & metrics** with NASA for **weak/unlabeled** data on ML Commons.

Software Engineer II (Applied Machine Learning), Altor Smart Mobility — **Nov 2020 - Jul 2022**

- **Led a team of** Software engineers & Data Scientists to create India's first smart helmet ecosystem, revolutionizing road safety.
- Collaborated with cross-functional teams to define PRDs, establish success criteria, and prioritize tasks for on-time delivery.
- Architected **scalable Python** backend for reporting engine on **Docker Swarm in AWS EC2 Cluster** for 300k users.
- Trained and deployed **Transformer-based Model** in mobile devices for accident detection, with future LLM integration.
- Trained and deployed **Supervised & unsupervised ML models** in **Airflow** analyzing **300k** riders for valuable product insights.
- Designed and pruned a **Deep Learning model for ARM-based chips**, achieving **95%+** human head detection accuracy in smart helmets for hands-free navigation and safety.
- Curated **100+GB** simulated IMU data, powering deep learning models for ride profiling & accident detection.
- Optimized Data Science ETL pipelines with **JIT** compilation for **70% runtime reduction**, driving the reporting engine.
- Uncovered cost inefficiencies via TB-scale data analysis, enabling **60% cloud cost reduction** with AWS Lambda autoscaling.
- **Architected and developed** well-organized **Embedded Software with BLE integration for core product lines** (Smart Helmets Audio & Protection Profiles, Vehicle Diagnostics), **reducing development time by 25%** for fellow engineers.

Senior Application Engineer, L&T Technology Service Limited — **Mar 2020 - Oct 2020**

- **Led the team** in cloud deployments in Docker and later in Kubernetes for analyzing Fit-Bit data for the business use case.
- Used AWS Firehose to ingest huge volume of streaming data, later to be processed by **AWS SageMaker** platform.
- Automated deployments with shell scripts for **Just-In-Time device provisioning**, for remote devices.
- Automated reporting using **Kafka, AWS Glue, and AWS Athena,** reducing reporting time by **70%** eliminating manual processes.
- Enhanced the **CI/CD pipeline** by automating Kubernetes pod deployment with **helm charts**.

Embedded Software Engineer (Research & Development), Distronix LLC. — **Jan 2017 - Feb 2020**

- Successfully contributed to the **growth and success** of a dynamic tech startup.
- Reduced development time through proactive **research and insights** on **ARM M4 based SOCs** and its relevant Tech Stack.
- Ported open-source **MQTT stack** for seamless data transmission over **Kafka** streams improving IO throughput by **20%**.
- Designed and developed an **embedded IoT network stack** for low-latency communication over a **2G network**.

PERSONAL PROJECTS

- **Bridging the gap between RGB and Event Cameras**: Recreated a SOTA research paper and improved upon the Accuracy by 5% and Training Time by 48% by introducing efficient computation blocks in the architecture. (Github) **Jan 2023 - Apr 2023**
- **Multi-Task Learning for Field Segmentation and Boundary Detection with Explainable LLM:** Developed a pipeline using Swin-Transformers as backbone with task specific decoder layers using UNet and YOLO v8. Used a LLM to interact with the task selection and result interpretation in human readable format. **Jan 2024 - Current**

PUBLICATIONS

- Paul, Tuhin Utsab, and Aninda Ghosh. **"Smart Support System for Navigation of Visually Challenged Person Using IoT."** Data Engineering for Smart Systems, 2021, pp. 27–36., (Link). **Jun 2016 - Jan 2017**
- Utsab Paul, Tuhin. **"Brain Tumor Texture Analysis – Using Wavelets and Fractals."** International Journal of Medical Imaging, vol. 4, no. 4, 2016, p. 23., (Link). **May 2015 - Aug 2015**