

BHUVANA NAGARAJ

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Education

Northern Arizona University

Dec 2025

Master of Science (MS) in Computer Science

GPA: 3.75/4.00

- **Coursework:** Data Structures, Algorithms, High Performance Computing, Systems Software, Databases, Machine Learning, Deep Learning, Artificial Intelligence, Large Language Models

Experience

Samsung Research

Jul 2018 – Jan 2024

Senior Associate Engineer

Bangalore, India

Camera Systems

- Designed and commercialized scalable camera frameworks for Galaxy S/Note/Tab and Foldables (Z-Fold/Z-Flip), integrating Android HAL and multimedia layers to achieve 34% faster capture and improved performance across 12M+ devices.
- Built TensorFlow/OpenCV-based ML modules for automated defect detection and image-quality analysis, increasing accuracy by 30% and reducing validation effort by 50%.
- Developed C++/Python debugging and profiling tools for HAL/kernel layers, reducing crash rates by 40% and doubling CI/CD integration efficiency.

Samsung Digital Ads

- Engineered a real-time ad-detection and validation system using TensorFlow, OpenCV, and ACR data, boosting global ad-verification accuracy by 30% and reducing campaign auditing time by 40%.
- Developed scalable backend microservices and budgeting automation tools in Python and Java, improving ad-delivery efficiency and saving 20% in annual operational costs across multi-region markets.
- Integrated ML inference pipelines into Jenkins CI/CD for automated ad-content validation and telemetry tracking, cutting manual QA by 45% and accelerating feature deployment by 2x.

Multimedia & Cross-Functional Collaboration

- Developed core modules for Samsung's multimedia and image-recognition platform, implementing C++/Python pipelines for real-time frame analysis and on-device TensorFlow Lite inference.
- Collaborated with global Ad's, camera, and multimedia teams to co-design APIs and optimize encoder-decoder workflows for next-gen Galaxy flagship devices.

Samsung Research

Jan 2018 – Jun 2018

Software Engineer Intern

Bangalore, India

- Built a Single Sign-On (SSO) CAS using Java Servlets, WebSockets, and Digital Certificates on Apache Tomcat.
- Developed real-time data visualizations (box plots, heatmaps, sparklines) with React, D3.js, and Ignite UI to enhance internal analytics dashboards.

Projects

Explainable AI (XAI) for Autonomous Cybersecurity Threat Detection & Mitigation (*TensorFlow, SMOTE*) May 2025

- Built an FNN with focal loss to detect 28 IoT cyberattacks, achieving 76% accuracy under severe class imbalance.
- Processed and balanced the IoT-23 dataset (2.5M samples) with SMOTE; established a reproducible pipeline for training/evaluation.

Digital Advertisement Detection & Validation on Tizen Devices (*CNN, TensorFlow, OpenCV, Tizen, Docker*) Nov 2023

- Developed on-device real-time ad monitoring using OpenCV + TensorFlow; leveraged ACR to verify on-screen content.
- Containerized the stack with Docker for portable, scalable deployment across heterogeneous device fleets.

Technical Skills

- **Programming:** Python, Java, C/C++, JavaScript (React, Node.js), SQL, Shell, REST APIs, WebSockets
- **Frameworks & Tools:** React.js, Flask, Django, FastAPI, Spring Boot, Docker, Kubernetes, Jenkins, GitHub Actions
- **AI/ML:** TensorFlow, PyTorch, Scikit-learn, OpenCV, Keras, XGBoost, CNN/FNN, NLP (Transformers, BERT, T5), XAI/SHAP
- **Data & Cloud:** AWS (EC2, S3, Lambda, SageMaker), GCP (BigQuery, Pub/Sub), Apache Kafka, Spark, ETL, Elasticsearch
- **Systems:** Linux/Unix, kernel programming, multithreaded systems, performance tuning, CI/CD automation
- **Collaboration:** Git, Jira, Perforce, Agile/Scrum

Certifications: OCI Associate Architect, Oracle GenAI Professional, Oracle Cloud Professional

Recognitions

- Samsung Spot Award (Apr 2021) — successful completion of S21 camera program milestones.
- Samsung Spot Award (Apr 2023) — successful integration of Ads tracking for U.S. region on Samsung devices.