GURURAJ KHOT

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EDUCATION

The University of Tennessee, Knoxville 2023 - Present
Bachelor of Science in Computer Science, minor in Machine Learning and Applied Artificial Intelligence
***Relevant Courses**:* Introduction to CS 101 & 102, Data structures and Algorithms I and II, Probability and Random Variable, Introduction to Machine Learning, Systems Programming, Intro to Deep Learning, Software Engineering, Algorithm Analysis/Automation

EXPERIENCE

Digit7 Remote
Software Engineering Intern Jun 2025– Aug 2025

Backend Development Team (Month 1)
- Developed and deployed API using FastAPI & MongoDB, serving daily requests with <100ms response timeFocus on information relevant to the reader.
- Implemented Clean Architecture in FastAPI (routers → service/use-case → repository layers) using dependency inversion
- Implemented asynchronous service and repository layers in FastAPI using async/await, reducing average API response time under high concurrency

Computer Vision Team (Month 2)
- Built a color detection model independent of lighting using OpenCV and Lab color space, achieving 97% accuracy on the test dataset
- Enhanced image quality with CLAHE preprocessing and integrated edge detection, improving classification recall by 12%
- Applied advanced edge detection and image segmentation techniques to strengthen boundary recognition and increase overall model robustness

UTK Machine Learning Lab Knoxville, Tennessee
Research Assistant and Shadowee Sep 2024– Nov 2024
- Collaborated with Computer Scientist Hairong Qi to optimize neural network architectures using Python, improving model efficiency and accuracy
- Attended 40+ literature reviews on machine learning advancements in Natural Language Processing (NLP) and Computer Vision
- Assisted in the development and implementation of research protocols, including data collection, analysis and reporting

RELEVANT PROJECTS

Color Detector and Image Classification Model using Machine Learning **Digit7**
- Implemented a classification pipeline to distinguish objects based on Lab color features, achieving consistent performance across varying brightness conditions
- Designed and evaluated multiple preprocessing strategies (normalization, noise reduction, CLAHE) to improve dataset quality and model stability
- Benchmarked different machine learning classifiers (k-NN, SVM, ANN) for image classification, selecting the best trade-off between accuracy and computation time

Gender API — FastAPI + MongoDB (DigitMart Services) **Digit7**

- Built a realm-aware Gender API in FastAPI enabling secure access to tenant-specific MongoDB databases with dynamic filters, pagination, and sort logic
- Designed a reusable aggregation pipeline utility using aggregate_with_pagination and Pydantic models to return strongly typed and paginated responses
- Integrated validation for realm existence and header inputs, improving API reliability and allowing seamless integration with multi-tenant backend systems.

SKILLS

- **Languages:** Python, C++, Linux, JavaScript
- **Tools and Platforms**: Git/GitHub, Docker, Jupyter Notebook, Azure/AWS
- **Libraries:** OpenCV, NumPy, Matplotlib, TensorFlow, PyTorch, Pandas, Matplotlib, Pydantic, Motor/PyMongo
- **Concepts:** RESTful APIs, Backend Architecture & Design, Dependency Inversion, Asynchronous Programming, Image Processing, Edge detection, Image segmentation, Artificial Neural Networks (ANN), Convolutional Neural Networks (CNN)

HONORS & AWARDS

Honors Diploma, National Beta Club participant (GPA 3.0 above or with any AP or Honors Classes), Prestigious Seal of Biliteracy (Awarded to mastery of one more language than English)