

SHENGKAI (SAM) XU

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SUMMARY

As an international student with a strong engineering background and a passion for innovative technologies, I strive to make a positive impact by driving change through my work.

EDUCATION

M.Sc. Computer Engineering | University of North Carolina at Charlotte Aug 2022 - Aug 2024

- Research in Deep Learning and Computer Vision on Edge Devices/Servers

B.Sc. Computer Engineering | University of North Carolina at Charlotte Jan 2018 - Dec 2022

- Concentration in Machine Learning
- Minor in Mathematics

EXPERIENCE

Research Assistant | TeCSAR Aug 2022 - Jan 2023

- Researched and developed an AI pipeline for civilian security and public safety systems, with a specific focus on video processing and anomaly action detection
- *TeCSAR (Transformative Computer Systems and Architecture Research Lab) is a UNC Charlotte research lab led by Dr. Hamed Tabkhi. The lab uses machine learning, deep learning, and data analytics to improve community safety, health, and well-being.*

Embedded Firmware Engineer | Oxit May 2021 - May 2023

- Responsible for research and development initiatives aimed at crafting innovative tools to enhance project efficiency. Proficiently designed and implemented IoT automation pipelines within both AWS and Google Cloud environments.
- One of my major contributions was designing module libraries that streamlined embedded applications for different chip-sets
- *Oxit is an engineering company specializing in low-power, long-range RF communication technology for IoT applications, including LoRa.*

SKILLS

Programming	Python, SQL, Embedded C, C++, VHDL
ML/AI	Pytorch, TensorFlow, Keras, Panda, scikit-learn
Embedded System	ESP32, STM32, Arduino, RaspberryPi
CAD	SOLIDWORKS, EAGLE, KiCAD
Cloud Service	AWS, Google Cloud, OpenAI, RunPod
Misc	Git, GitHub, Linux, Vivado, LaTeX

PROJECTS

AI-Powered Discord ChatBot | PyTorch, Huggingface.co, LangChain, PrivateGPT *Personal Project*

- Developed an innovative Discord assistant bot, utilizing LangChain and Hugging Face's large language models to enable sophisticated user interactions. Demonstrated expertise in AI and chatbot technology to enhance user engagement and experience in Discord communities.

Mask Detector | PyTorch, Kaggle, YOLO, OpenCV *University Course Project*

- Implemented YOLOv4/5 models to analyze mask usage in crowds from video footage, enabling statistical insights on mask-wearing in the surrounding area.

Pet Detector | Keras, Embedded C, Nvidia Jetson Nano, ESP32, TensorFlow Lite, *Oxit Tech Demo*

- Utilized using transfer learning with FOMO, a lightweight version of MobileNetv2, for edge devices such as Nvidia Jetson Nano and ESP32 embedded systems.

Student Formula Race Car | Electronic, CAD, Hardware *University Club Project*

- Contributed to the electrical power and wiring department of the Student Formula Racing club, assisting the team in their participation in the Formula Student engineering competition.

PUBLICATIONS

Path Planning for Robotic Delivery Systems

Mar / April 2022

IEEE SoutheastCon 2022

DOI: 10.1109/SoutheastCon48659.2022.9764058

- The study uses a modified Dijkstra's algorithm and a directed graph, based on GPS locations from Open Street Map, for efficient path planning across a university campus.
- A node-abstraction method compresses the graph to reduce time complexity, significantly improving computation time in simulation results.

Charlotte Area Traffic Light Dataset

In Press

IEEE HONET 2023

- A new dataset with over 4,000 dashcam images from Charlotte, NC, includes diverse weather and lighting conditions to benchmark traffic light detection models.
- The dataset reveals performance variations in models like YOLOv5 under different conditions, emphasizing region-specific factors in traffic light perception.

EXTRACURRICULAR & AFFILIATION

- IEEE-HKN (ETA KAPPA NU)
- UNC Charlotte Engineering Leadership Academy
- UNC Charlotte Area Robotic Team
- UNC Charlotte Formula SAE