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EDUCATION

➢ **University of Science and Technology of China (USTC)** Hefei, China
M.Sc., Computer Science **2023–2026 (expected)**
GPA: 3.71/4.0

- **Relevant coursework**: Edge and Cloud Computing, Deep Learning, Parallel and Distributed Computing, Image Understanding, Image Processing, Algorithm Design and Analysis.
- **Thesis (in progress)**: SAM Enhanced Fire Segmentation: From Promptable Foundation Models to Efficient Architectures with Hybrid Refinement for Edge Deployment.
  - *Focusing on integrating promptable vision models with lightweight networks for real-time fire detection on edge devices.*

Advisor: Dr. Zhang Xinming

➢ **Jiangxi University of Engineering (JXUE)** Xinyu, China
B.Eng., Electronic and Information Engineering **2019–2023**
GPA: 4.00/4.00

- **Relevant coursework**: Sensor Technology, Microcontroller Principles and Applications, Circuit Analysis, Analog Circuits, High-Frequency Circuits.
- **Thesis**: Piezoelectric Shoe Insole: A Step into the Future of Renewable Energy.
  - *Focusing on a wearable energy-harvesting insole.*

Advisor: Dr. Parmod Kumar

RESEARCH INTERESTS

Machine Learning & Computer Vision (efficient neural networks, image/video segmentation and detection, interpretable/deployable AI), **Edge/Cloud AI Systems** (neural network optimization for embedded devices, edge–cloud collaboration), **Applied AI** (fire safety, medical imaging, smart environments), **Interdisciplinary applications** (AI in robotics, sustainable systems).

RESEARCH EXPERIENCE

➢ **University of Science and Technology of China (USTC)** Hefei, China

Graduate Researcher, Wireless Networks & Big Data Research Lab **2023–Present**

- **LimFUNet (Less is More Fire UNet):** Designed LimFUNet, an efficient segmentation architecture for edge and mobile deployment by investigating SE-enhanced Ghost convolutions and hybrid refinement strategies.
- **Promptable Fire Segmentation (ProFSAM):** Adapted promptable foundation models (SAM2) for safety-critical domains (Fire segmentation) with strategic bounding-box guidance for real-time operation (ProFSAM).
- **Dual-Path Edge CNN for Medical Imaging:** Developed an efficient dual-path network for medical image classification, focusing on edge-aware features, emphasizing both efficiency and high diagnostic accuracy.
- **Face Detection & Attendance System:** Developed a comprehensive experimental approach to enhancing face detection and recognition for a classroom attendance system.
- **Adaptive IoT Safety System (Arduino Project):** Designed an advanced adaptive neuro-fuzzy systems for real-time fire detection and temperature regulation in summer using Arduino.

➢ **Jiangxi University of Engineering (JXUE)** Xinyu, China

Undergraduate Researcher, Renewable Energy and Robotics **2021–2023**

- **Piezoelectric Insole Energy Harvester:** Developed a prototype shoe insole with piezoelectric materials to convert walking motion into electrical energy. Conducted experiments to measure power output and charging characteristics for consumer electronics
- **Autonomous Robotics:** Developed mobile obstacle avoidance robot and humanoid traffic control robot using Arduino microcontrollers, sensors and actuators.
- Developed a mobile fan-cap and utilized a microcontroller and the Piezoelectric-powered AA battery from the shoe insole project.

PUBLICATIONS

Conference (accepted, to appear)

- ***Ugwu, E. U****. & Zhang, X*. (2025, accepted). "Promptable Fire Segmentation: Unleashing SAM2's Potential for Real-Time Mobile Deployment with Strategic Bounding Box Guidance". 9th International Conference on Image and Graphics Processing (ICIGP '26), Wuhan, China, http://arxiv.org/abs/2510.21782. (First author; peer-reviewed, accepted).
  - **Contribution***: First work to adapt and evaluate SAM2 for safety-critical video segmentation with detection-guided prompting strategy*

- ***Ugwu, E. U.**, Zhang, X., Tesfay, S. G., & Mehmood, M. H.* (under journal review). "Enhancing Real-time Fire Segmentation: LimFUNet with SE-Enhanced Ghost Convolutions for Edge Computing Applications." The Visual Computer. (First author).
  - **Contribution**: *Novel lightweight U-Net variant achieving 21+ FPS on edge devices while maintaining high segmentation accuracy of 80.06% with model size of 0.35MB and less than 20k parameters.*
- *Mehmood, M. H., Zhang, X.,* ***Ugwu, E. U.*** "Edge-Aware Dual Path Network for Medical Image Classification." Machine Vision and Applications. (Third author).
  - **Contribution***: Dual-path architecture combining edge detection and texture features for improved medical image diagnosis*

TECHNICAL SKILLS

- **Programming**: Python, C, JavaScript (HTML/CSS), MATLAB, Bash.
- **Machine Learning & CV**: TensorFlow/Keras, PyTorch, OpenCV, YOLO, Mask R-CNN, SAM (Segment Anything Model), data annotation (LabelImg, Roboflow), ML libraries (scikit-learn).
- **Cloud & DevOps**: Linux (Ubuntu), Docker, Kubernetes, AWS (EC2, S3, VPC, IAM, CloudWatch, Route53), Terraform, Git/GitHub, GitHub Actions (CI/CD), shell scripting.
- **Hardware/Embedded**: Arduino, Raspberry Pi, sensors and actuators, hardware interfacing.
- **Networking/Security**: TCP/IP, VPN (OpenVPN), firewalls, packet analysis (Wireshark), network scanning (Nmap).
- **Other Tools**: Jira, Slack, Datadog.

CERTIFICATIONS

- Digital Witch's DevOps and Cybersecurity Training – Certificate of Completion **2025**
- HSK 4 (Chinese) **2025**
- Python-Programming Certificate from HiiT Online Training **2023**
- Computer Vision and Intelligent Applications – Certificate of Participation **2023**
- Cisco Networking Academy: IT Essentials, **2017**

HONORS & AWARDS

- Chinese Government Scholarship, Ministry of Education – Full scholarship for graduate studies in China **2023–Present**
- Jiangxi Provincial Government Scholarship – Awarded for academic excellence (top GPA) at JXUE. **2021–2023**
- Academic Excellence Award, JXUE – Recognized for outstanding academic performance **2020–2021**
- First Prize, Chinese Language Competition, JXUE – Two-time winner of university-wide language contests for international students. **2020 & 2021**

LEADERSHIP & OUTREACH

- **Foreign Students Association (FSA), USTC**: Board member of the Foreign Students Association (2024–2025). Organized international student events and academic exchanges, fostering a multicultural campus community.

- **Open-Source Contributions:** Developed and shared cloud deployment scripts and Docker tutorials on GitHub. Authored technical guides on IoT and deep learning on LinkedIn and Medium for community education.

LANGUAGES

- English (Fluent)
- Chinese (Intermediate – HSK 4)

REFERENCES

Available upon request.