CHIEH TSAI

Linkedin

Tel: +1 (520)3436804 | Email: vegetableclean@arizona.edu

Core Skills & Expertise

Research area: Autonomous Driving | Smart Cities | Cybersecurity (Resilience) | Deep Learning | Computer Vision
Programming: C Programming | Python | Verilog | PyTorch |Keras |TensorFlow | Matlab | Simulink
Language: English | Chinese | Japanese

Engineering & Research Background

Autonomic Computing Lab – University of Arizona **Arizona, USA**
Graduate Research Assistant, Department of ECE Aug. 2024-current

- The study aims to design resilience methods to handle malicious attacks on autonomous vehicles, including the data fusion layer, data processing layer, decision layer, and control layer.
- Various threat models were simulated and applied to autonomous vehicles.
- The resilience methods were designed, including the integration of LiDAR, Depth cameras, RGB camera, and software communication frameworks

Course ECE 274A – University of Arizona **Arizona, USA**
Teaching Assistant, Department of ECE Aug. 2024-May 2025

- Assisting students in a Verilog and Vivado course. The course covers fundamental topics, including basic digital logic, LED display control, finite state machines (FSMs), and RTL Design.

VIP Lab, National Taiwan University of Science Technology **Taipei, Taiwan**
Graduate Research Assistant, Department of ECE July. 2023-Aug 2024

- The proposed model eliminates the window attention mechanism, substituting it with spatial and frequency self-attention to reinforce superior super-resolution detail learning, thereby enhancing the model's ability to capture finer details through spatial and frequency enhancements.
- Evaluated on the FGSCR dataset, with a specific focus on ship images, the proposed model achieves a notable 0.51 PSNR, 0.24 SSIM improvement and a 7% reduction in GFLOPs compared to the baseline SwinIR model.

VIP Lab, National Chi Nan University **Taipei, Taiwan**
Graduate Research Assistant, Department of EE Sep. 2019-June 2019

- Worked with a team of 3 to design an AI-equipped self-driving vehicle for campus navigation and security systems; won 3rd place in the department's project showcase and a cash prize of NT$3,000
- Spearheaded software integration, including image feature recognition such as gender and age; designed the software and hardware component integration and successfully integrated a self-driving car

Patents, Publications, and Presentations

1. Resilient State Estimation for Ground Robots: Consensus Fusion with Multi-Vehicle Validation under Cross-Layer Attacks, 2026 IEEE International Conference on Robotics & Automation (ICRA) (Submission)
2. Enhancing satellite image quality with the edge-based wavelet transformer for super-resolution, 2025, Available at SSRN 5459834, Journal of Applied Computing and Geosciences (Submission)
3. Intelligent Obstacle Resilience in Autonomous Vehicles Under Security Threats, 2025 IEEE Cyber Security and Cloud Computing (Accepted)
4. Spatial and Wavelet Attention-Enhanced Super-Resolution for Small Object Detection in Satellite Imagery, IEEE 8th open international conference electrical, electronic and information sciences eStream 2024, Republic of Lithuania
5. Enhancing Age and Gender Classification through cGAN-based Data Augmentation, IEEE Global Conference on Consumer Electronics (GCCE), Oct. 10-13, 2023, Nara, Japan
6. Real-Time Semantic Segmentation with Dual Encoder and Self-Attention Mechanism for Autonomous Driving, Sensors, 2021, 21.23: 8072

Education

PhD in Electrical and Computer Engineering | University of Arizona (USA)|(GPA: 4.0) Sep. 2024-current (Advised by Dr. Hariri Salim) Cloud and Autonomic Computing Center Funded by NSF and UA TRIF
MS in Electronic and Computer Engineering | National Taiwan University of Science Technology (Taiwan) |(GPA: 3.7) Sep. 2020-June 2023