

SUMMARY

M.Sc. candidate at NUS with computer vision research experience at A*STAR IME in SEM defect detection. Research experience in RGB-D salient object detection. Proficient in Python, PyTorch, OpenCV, and end-to-end model development from data annotation and training to evaluation and application prototyping.

EDUCATION

National University of Singapore (NUS), Singapore 08/2025-01/2027

Master of Science in Physics for Technology

Relevant Courses: Bayesian Statistics and Machine Learning, Complex Systems Analysis, Quantum Computation.

Focus Areas: Computer Vision, Deep Learning.

Southwest Jiaotong University, Chengdu, China 09/2021-06/2025

Bachelor of Science in Applied Physics

Relevant Courses: Data Structures and Algorithms, Linear Algebra, Probability and Statistics, Intelligent Detection and Control, Basics of Computer Programming, Digital Image Processing, Signals and Systems.

A+ grades in multiple programming courses, including Basics of Computer Programming and Computational Physics.

EXPERIENCE

SEM-Based Wafer Defect Detection System, Computer Vision Research Intern 08/2025-04/2026

*A*STAR - Agency for Science, Technology and Research & National University of Singapore*

- Developed an **end-to-end CNN-based defect detection pipeline** to identify AOGs from wafer SEM surface images.
- Collected and cleaned **288 high-resolution SEM images** through manual acquisition on SEM equipment, and **annotated pixel-level masks** in CVAT to build a labeled dataset.
- Benchmarked a classical intensity-based baseline, plain UNet, and a **ResNet34-based UNet**, achieving improved segmentation performance under identical settings and **evaluating models with IoU, Dice, and F1-score**.
- Deployed the model as an application prototype that automatically detects defects, reports industrial metrics including **defect count, location, and area**, and generates **batch-level statistical charts** to support faster and more objective materials characterization.

SELECTED PROJECTS

RGB-D Salient Object Detection via Multi-Modal Feature Fusion, Graduation Thesis

Southwest Jiaotong University 12/2024-06/2025

- Reproduced and optimized CMiNet for **RGB-D salient object detection**, training on NJUD+NLPR and COME15K.
- Evaluated performance on 5 benchmark test sets using **MAE, F-measure, and PR curves**; ablation studies showed $\geq 2.7\%$ F-measure improvement from critical modules.
- Compared with 12 fusion-based baselines on identical test sets, **achieving stronger results on four core metrics**, including an 8.5% MAE reduction versus BBS-Net.

YOLOv5-Based Surface Defect Detection for Industrial Inspection, Team Leader 10/2024-12/2024

Project-oriented AI Course, Southwest Jiaotong University

- Implemented and trained a **YOLOv5-based defect detection pipeline** in Python and PyTorch using the NEU-DET dataset, which contains 1,800 grayscale images across 6 defect classes, for surface defect inspection.
- Prepared dataset splits and evaluated performance using mAP, F1-score, precision, recall, achieving mAP 0.772, and maximum recall 0.97, demonstrating the feasibility of **real-time defect detection** for industrial inspection tasks.

Preparation and Performance Study of Carbon Nanotube Optoelectronic Sensors, Team Leader 05/2024-04/2025

- Led the **fabrication of seven batches of carbon nanotube optoelectronic sensors** on interdigitated electrode substrates using CVD and slurry spin-coating under different preparation conditions.
- Built and operated an optoelectronic testing platform, conducted 10+ performance measurements, and analyzed results to identify conditions for improving sensor performance.

SKILLS

- Programming:** Python, C/C++, TypeScript, MATLAB
- CV/ML:** PyTorch, OpenCV, TensorFlow, NumPy
- Tools:** Git, Jupyter, Linux, Docker, Vercel
- AI Tools:** Codex, Claude Code, Copilot, Cursor