Ruilin Wang

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Computer Vision Developer | Applied AI

PROFILE

Computer vision and applied machine learning developer completing a Master of Information Technology in Cyber Security at UNSW, with a BSc in Computing Science from the University of Alberta. Hands-on experience building and evaluating Python, PyTorch, TensorFlow, and OpenCV pipelines for object detection, semantic segmentation, image classification, denoising, and model benchmarking. Project results include 80.77% mAP@50 for 12-class pest detection, 0.9365 IoU for microorganism segmentation, and a 0.9464 F1-score for classification.

CORE SKILLS

Programming & Data: Python, NumPy, Pandas, scikit-learn, Jupyter
Computer Vision: OpenCV, image preprocessing, augmentation, object detection, image segmentation, classification, denoising, feature extraction
Deep Learning: PyTorch, TensorFlow, YOLOv8/11n/12n, Faster R-CNN (ResNet-50-FPN), U-Net/U-Net++, DeepLabV3+, DnCNN, ResNet18, EfficientNet-B0
Evaluation: mAP@50, mAP@50:95, IoU, Dice, accuracy, precision, recall, F1-score, ROC-AUC, confusion matrices, latency, FPS, failure analysis
Engineering: Git, Docker, pytest, GitHub Actions, automated testing, data validation, reproducible experimentation

EDUCATION

Master of Information Technology, Cyber Security Specialization | University of New South Wales | Expected Aug 2026
Bachelor of Science in Computer Science, Minor in Mathematics | University of Alberta | Dec 2024

SELECTED COMPUTER VISION PROJECTS

AgroPest-12 Insect Detection and Classification Benchmark

Computer Vision Developer | **Python, PyTorch, OpenCV, scikit-learn, YOLO, Faster R-CNN** | Feb 2025 - May 2025

- Compared classical HOG/SIFT-BoVW/SVM baselines with YOLOv8, YOLOv11n, YOLOv12n, Faster R-CNN with ResNet-50 FPN, and EfficientNet-B0 classification pipelines for 12 agricultural pest classes.
- Evaluated fixed train, validation, and test splits using mAP@50, mAP@50:95, accuracy, macro precision, recall, F1-score, ROC-AUC, latency, and FPS; YOLOv11n achieved 80.77% mAP@50 for detection and 97.73% image-level classification accuracy.
- Performed error analysis on small, low-contrast, and camouflaged insects, missed detections, and visually similar pest classes.

Environmental Microorganism Image Analysis Using Deep Learning

Applied AI Developer | **Python, OpenCV, PyTorch, TensorFlow, U-Net++, DeepLabV3+, ResNet18** | Sep 2025 - Dec 2025

- Collaborated on a modular EMDS-6 image-analysis pipeline covering denoising, segmentation, feature extraction, classification, and object detection.
- Compared TROF and DnCNN preprocessing with U-Net, U-Net++, and DeepLabV3+ segmentation; U-Net++ after DnCNN achieved 0.9365 IoU and 0.9843 Dice.
- Evaluated handcrafted-feature SVMs and CNN/Transformer classifiers; ResNet18 achieved a 0.9464 F1-score, with Faster R-CNN used for microorganism localization.

ADDITIONAL ENGINEERING EXPERIENCE

OpenET 2 - Remote Eye-Tracking Collection and Benchmarking Platform

Software Developer & Release Integration Lead | **Python, Pandas, NumPy, OpenCV, pytest, Docker, GitHub Actions**
UNSW COMP9900 Client Capstone | Feb 2026 - Aug 2026

- Co-developed a modular Python CLI that unified data collection, standardization, quality checks, analysis, and report generation for GP3 and Tobii eye-tracking data.
- Built structured session metadata and deterministic dry-run workflows, enabling device integration and end-to-end testing without physical eye-tracking hardware.
- Integrated 13 runtime modules, packaged analysis, testing, and reporting workflows with Docker, and configured a Windows GitHub Actions pipeline with 33 automated tests.
- Validated 40 sessions and 278 source files in an 85-second batch with zero pipeline failures, while preserving source data through read-only processing and SHA-256 provenance checks.