

# YUEHAN HE

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## Education

### University of Michigan-Ann Arbor

Expected Graduation: May 2026

*M.S.E. in Electrical and Computer Engineering, Computer Vision Track*

*Ann Arbor, MI*

- Dean's Honor's List — **GPA: 3.70/4.0**
- Courses: Machine Learning, Computer Networks, Natural Language Processing, Advanced Computer Vision, Biomedical AI

### University of Michigan-Ann Arbor

Graduated Dec 2024

*B.S.E. in Computer Science*

*Ann Arbor, MI*

- Dean's Honor's List — **GPA: 3.35/4.0**
- Courses: Data Structures & Algorithms, Computer Architecture, Computer Vision, Computational Theory, Applied Machine Learning, Web Systems, Mobile App Development, Database Systems, User Interfaces.

## Research Experience

### End-to-End Autonomous Driving with Foundation Models

May 2025 – Present

*Advised by Morley Mao*

*Ann Arbor, MI*

- Improving upon **OpenEMMA**, an End-to-End Multimodal model for Autonomous Driving by incorporating a retrieval-augmented prompting framework to fuse prior road knowledge with on-board camera feeds.
- Optimizing and accelerating computation speeds of the LLM to achieve offline capability operating on vehicles locally.

### Contactless Vital Sign Monitoring

Jan 2024 – Present

*Advised by Mohammed Islam*

*Ann Arbor, MI*

- Implemented and evaluated a **Temporal Shift Convolutional Attention Network** for physiological signal modeling, achieving high generalizability across datasets (Pearson correlation: **0.989**,  **$R^2 = 97.8\%$** ).
- Currently designing an Anomaly Detection pipeline for driver drowsiness by improving upon the **LLaVA Computer Vision Transformer model**.

## Work Experience

### Omni Sciences Inc.

May 2024 – Aug 2024

*Software Engineer Intern*

*Ann Arbor, MI*

- Developed and trained a custom **1D convolutional neural network (CNN)** to identify informative bitplanes from RGB video data, improving heart rate prediction accuracy by filtering out noise in facial blood flow signals.
- Engineered a **image processing pipeline** to extract and structure **24-bitplanes** (8 per RGB channel) from **93** training videos, enabling **efficient ML** model input for physiological signal enhancement.

### FaceDrive Inc.

Jun 2022 – Aug 2022

*Backend Developer Intern*

*Toronto, ON, Canada*

- Integrated **CI/CD** pipelines into a Warehouse Management System written in **Java** to streamline deployments and improve supply chain efficiency by 20%.
- Ensured the efficiency and correctness implementation of the pipeline by using **JUnit** for unit testing before deployment.

## Projects

### Kaggle ISIC 2024 - Skin Cancer Detection with 3D-TBP | [Competition Link](#)

Python | Tensorflow | PyTorch | CUDA

- Designed and trained a **convolutional variational autoencoder** to synthetically generate malignant skin lesion images, addressing **class imbalance** in a skin cancer classification task using **latent space sampling**.
- Built and evaluated an **Multimodal Ensemble Model** (DenseNet, ResNet50, ImageNet, XGBoost, LightGBM, CatBoost) to classify skin cancer lesions, applying advanced techniques such as **SMOTE**, feature engineering, and **cross-validation** to handle class imbalance and improve generalization.

### Computer Use Automation

Claude | Huggingface | PyTorch | CUDA

- Developing an **LLM-powered desktop automation agent** that integrates voice input, visual perception (OCR/screen parsing), and mouse/keyboard control to perform real-world GUI tasks autonomously.
- Integrating **multimodal models** (e.g., Claude/GPT-4o) with real-time system control tools to enable dynamic task planning, GUI element detection, and interaction across macOS/Linux environments for generalized **human-computer interaction**.

## Technical Skills

**Languages:** Java, C++, Python, C, JavaScript, HTML, Swift, SQL

**Developer Tools:** Git, Linux, Bitbucket, Docker, Oracle Cloud, Colab, Kaggle, Hugging Face

**Libraries/Frameworks:** AWS, Django, MongoDB, PostgreSQL, PyTorch, Tensorflow, Scikit-learn, TorchVision