Wenhao He

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Education

•University at Buffalo, The State University of New York *Aug 2022 - Feb 2024*

Master of Science in Engineering Science focus on Artificial Intelligence

Coursework: Machine Learning, Deep Learning, Computer Vision, Reinforcement Learning, Robotic Algorithm

Award: Graduate Opportunity Program Tuition Scholarships (Sep 2022, Jan 2023, Aug 2023)

•University at Buffalo, The State University of New York *Aug 2018 - May 2022*

Bachelor of Science in Computer Science

Coursework: Data Structures, Computer Architecture, Computer Networking, Web Application

Skills

Languages: Python, SQL, JavaScript, HTML, CSS, C/C++, LaTeX
Libraries: Numpy, PyTorch, Pandas, Sci-kit Learn, Scipy, PySpark, OpenCV, Matplotlib
Frameworks: ROS, Hadoop, PyTorch, Tensor-Flow, React, Flask, Pygame, NodeJS
Developer Tools: Jupyter, PyCharm, IntelliJ IDEA, Visual Studio Code, Magicavoxel, GitHub, ZenHub, Git, Docker
Cloud/Databases: AWS, MongoDB, MySQL
OS: Windows, Linux, MacOS

Research

•Audio Cloning: Librosa, PyTorch, Matplotlib, Python *Aug 2023 - Present*

Engaging in a Deep Learning project for cloning judge's voice in civil rights case Brown v. Board of Education

- supervised by **Dr. David S. Doermann**
- Collaborated with a team of 4 and **collected over 300 recorded voices of judges** for model training
- Replicate judge's voice with **90% accuracy** for reading court decisions, enhancing the authenticity of digital records
- Bringing court documents to life and **preserving authentic historical sounds** through modern techniques

Projects

•Monocular Depth Estimation in Single Image: PyTorch, OpenCV, Matplotlib, Python *Feb 2023 - May 2023*

Conducted a Deep Learning project to ascertain distance between photographer and object in a 3D world.

- Cooperated with a team of 4 and **engineered Computer Vision algorithms** for feature extraction
- Collected large image-depth map pair datasets **comprising over 50,000 images** for a deep-learning model, enhancing the model's training effectiveness.
- Trained a deep learning model for monocular depth estimation, **improving object recognition accuracy by 10%**
- Measured distance between photographer and object **in 3D using an existing 2D image**

•Multiple-agent Playing GoMoku Board Game: PyTorch, Matplotlib, Python *Mar 2023 - May 2023*

A Reinforcement Learning project trains agents to play GoMoku board game

- Crafted a **Monte Carlo Tree Search algorithm** as own model, with a **100% win rate** over pure MCTS
- Comparison between own model and present AlphaZero model, cutting the time cost for **100 training episodes by 76.67%**
- Trained agents using a custom MCTS model and AlphaZero, achieving competitive self-play outcomes

•Detection on Fruit/Vegetables in 2D Images: PyTorch, OpenCV, Matplotlib, Python *Mar 2023 - May 2023*

Conducted a Computer Vision project for detecting fruit and vegetables in 2D images

- Identified **over 100 classes** of fruit and vegetables with a model exhibiting a **training loss decrease to under 0.05** and **test accuracy surpassing 98%**
- Developed an algorithm to count and categorize fruits and vegetables in images, reliably processing images with scale variations and **maintaining an accuracy rate of over 95%**
- Implemented edge detection techniques in Computer Vision, contributing to a robust feature extraction process that enhanced the model's **overall classification precision by 15%**

•Class Chat Application: MySQL, Docker, Python, JavaScript, HTML/CSS *Sep 2021 - Dec 2021*

A Web App project for class-wide social network chat app

- Developed a private messaging system for **40+ users** with instant delivery in a class chat app
- Fashioned UI for users to create a profile customization, **with 80% user adoption rate**

Experience

•University at Buffalo, The State University of New York *Feb 2020 - Mar 2021*

Food Services at Student Union Onsite

- Partnered with a team of **more than 10 employees**
- Presented an **average of 50 customers** and satisfied their needs per day