

# Wenhao He

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## EDUCATION

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- **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

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**Languages:** Python, SQL, JavaScript, HTML, CSS, C/C++, L<sup>A</sup>T<sub>E</sub>X  
**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

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- **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

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- **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**