Huaidian Daniel Hou

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Education

University of Michigan

Ann Arbor, Michigan — August 2022 - Present

- Pursuing BSE in Computer Science and Minor in Mathematics
- GPA: 4.00/4.00
- Honors: Branstrom Freshman Book Prize (2023), Engineering Dean's List (2022, 2023)
- Selected Coursework: Programming and Intro Data Structures (C/C++), Discrete Mathematics

Research Experience

Minsheng Fintech Corp. Ltd

Wuhan, China, *Research Intern* — July 2023

- Investigated potential for Transformer-based search system for China Minsheng Banking mobile app, focusing on academic publications on NLU models. Authored technical report detailing NLP models, evaluation parameters and benchmarks, system engineering advice, implementation details, and associated technical resources.
- Experimented with multi-factor tagging model for search query designs and explored model fine tuning process with Hugging Face Transformers with other Search team members. Prepared dataset for model fine-tuning.

University of Michigan Shapiro Design Lab

Ann Arbor, Michigan, *Student Intern* — November 2022 – Present

- Collaborating with U-M Ph.D. candidate Erica Gardner to design an accessible artistic representation of a Winogradsky Column for visually impaired visitors. Conducting research on neural representations of tactile signals, differentiation, and fabrication of complex tactile signal. Prototyping with OpenCV and 3D printing samples.

Frankfurt Institute for Advanced Studies

Haverford, Pennsylvania/Virtual, *Research Intern* — February 2021 - December 2021

- Conducted research on using Convolutional Neural Networks to predict crowd pedestrian motion in a confined space. Designed experiment to simulate real-time evacuation behavior. Designed TensorFlow CNN models to analyze Cellular Automaton simulation results.
- Co-authored research paper "Detecting dynamical parameters in evacuation behavior via deep convolutional neural networks", which was accepted by IEEE Conference Publishing Services for EEBDA 2022.

Work Experience

Dreame Technology Co. Ltd

Shanghai, China, *Software Engineer* — June 2021

- Participated in development of C++ library of Kalman Filters for IMU sensor fusion on home cleaning robots. Studied SLAM and the mathematical foundations for multimodal sensor fusion technology.

Featured Projects

Spatial Audio Guidance System

Zhengzhou, China, *Independent Develop* — August 2021 – January 2022

- Designed the Spatial Audio Guidance System that help visually impaired users detect moving objects in mixed environments via spatial audio representations. Integrated real-time object recognition with spatial audio library with a custom object filtering system in Python and C++.

Machine Learning Forum Post Classifier

Ann Arbor, MI, *Student* — April 2023

- Designed and implemented a Bayes forum post classifier for Piazza. Implemented map class with underlying BST in C++. Designed modular, memory-efficient ingest and training functions and command line interface. Additionally designed functions for batch distribution of training data, batch processing, and map fusion to enable multi-thread training on CPU.

Euchre Game Simulator

Ann Arbor, MI, *Student* — March 2023

- Designed and implemented a Euchre Game simulator with card shuffling, dealing, scoring capabilities, an AI robot player playing under a strategy, and a user-playable interface in C++ using templates and polymorphism.

VEX Robot Framework and VR-Based Tuning Utility with ROS
Haverford, Pennsylvania, *Software Team Leader* August 2021 - June 2022

- Led team research and development of a scalable control and navigation stack for high school VEX robotics team. Independently designed odometry-inertial positioning, motor controlling, and Pure-Pursuit path following libraries along with templates for future algorithm implementations.

Robot Parameter Tuning with Linear Optimization and VR
Haverford, Pennsylvania, *Independent Developer* May 2022 - June 2022

- Developed parameter-tuning utility (OTune) for wheeled-odometry positioning with ROS and SteamVR in Linux, which reduces tuning time by more than 95%.
- Derived linear optimization models for multiple wheel configurations to fit onboard tracking wheel velocity data to ground truth velocities recorded by VR base stations.

Analytics Reflector
Ann Arbor, Michigan, *Independent Developer* November 2022 – December 2022

- Developed a website with HTML5, CSS, and JavaScript to show the power of cookies, IP and operating system detection, cross-site tracking, and user profiling as a final project for the *Digital Studies: Digital Incarceration* class.
- Researched and documented common ways of third-party cross-site tracking procedures, the use of cookies in web browsing, as well as user classification methods to show users practical ways of protecting their online privacy against implicit digital incarceration.

Skills

Programming Languages: C++, Python, JavaScript

Programming Frameworks/Tools: PyTorch, Django, PyQt, ReactJS, ROS**,** Docker
Communications: Fluent professional communication in English and Chinese