Hang Yin

(773) 290-0885 | hangyin2023@u.northwestern.edu | hang-yin.github.io/portfolio | github.com/hang-yin

EDUCATION

Northwestern University **Evanston, IL**
M.S. in Robotics *Sep. 2022 - Dec. 2023*
B.S. with honors in Computer Science, summa cum laude *Sep. 2019 - June 2022*
Coursework: Embedded Systems in Robotics, Robotic Manipulation, Machine Learning, Microprocessor System Design, Operating System

RESEARCH EXPERIENCE

Human Computer Interaction Research **Evanston, IL**
Northwestern Delta Lab *Mar. 2021 – Jun. 2022*
- Designed and developed a scripting interface with JavaScript and React for mentors to translate their high level understanding of students' ineffective research and learning strategies into machine detectable conditions in a team of two
- Conducted user studies and analyzed quantitative and qualitative results to help with prototype iteration
- Wrote a grant proposal and awarded funding for research through the Undergraduate Research Grant program
- Compiled results including how scaffolding questions, combination of top-down and bottom-up script construction, and reflect and expand prompt can help mentors to proactively detect situations in the future and respond to them more effectively into a 6-page paper

Machine Learning Research **Evanston, IL**
Northwestern Image and Video Processing Lab *Mar. 2021 – Sep. 2021*
- Implement a Convolutional Neural Network (CNN) with PyTorch to correct blurring as a result of motion during brain MRI acquisition
- Implemented a modification to the U-Net architecture and achieved an MSE of 3.3e-04
- Adopted FreeSurfer software to perform transformations on brain MRI and simulate blurring using real motion files

PROJECTS

Graph Convolutional Network for Sentiment Analysis *CS 397 Seminar in Statistical Language Modeling*
- Modeled both syntax and semantic information of natural language by combining pre-trained embeddings (BERT) with dependency parse trees using edge-conditioned Graph Convolutional Networks
- Evaluated language model on IMDB Movie Review Dataset
- Implemented baseline models including Feed Forward Network, BiLSTM, CNN, and sentence level Graph Convolutional Network

iExpressionNet Deep Learning Model *EE 435 Deep Learning Foundations*
- Developed a Convolutional Neural Network to detect facial expressions based on the FER-13 dataset
- Established transfer learning to achieve 90%+ accuracy on user-specific dataset

Quadrotor Design and Control *ME 410 Mechatronics - Quadrotor-based Project*
- Designed and built a quadrotor for autonomous flight
- Implemented code in C for IMU, complementary filter, joystick control, PID closed loop control, and Vive IR sensor integration

Pen Recognition and Control *Independent Project*
- Located a pen in 3D space with a computer vision pipeline, which includes aligning depth map to RGB image, thresholding image in the HSV color space, filtering image with dilation and erosion operations, constructing contours and the centroid of the pen
- Programmed the PincherX 100 Robot Arm to grab the pen given its coordinates with respect to the camera in 3D space

Path-planning Algorithm Implementation *Independent Project*
- Implemented path-planning algorithms including Rapidly-Exploring Random Tree (RRT) and A* Search
- Tested RRT algorithm with randomly generated circular obstacles and arbitrary obstacles imported from images

TreeHealth Mobile Application *CS 394 Agile Software Development*
- Built a React Native mobile app with CI/CD pipeline for tree researchers to visualize data from dendrometer, sap flow sensors, etc.
- Utilized Victory Chart library to display data from multiple sources with a unified scale so that it shows how different factors interact

LEADERSHIP EXPERIENCE

CHISRO Forum **Shenzhen, China**
Cofounder & Manager *Aug. 2017 – June 2019*
- Worked with an Israeli robotics team to build an online forum for sharing manufacturing resources and technical tutorials using React
- Grew forum to host 500+ users across 4 countries

Team Mulan **Shenzhen, China**
Cofounder & Mentor *June 2018 – Sep. 2019*
- Co-founded and recruited members for team Mulan, the first all-girl robotics team in China
- Mentored the team on mechanical design, software control, and sponsorship management (fundraised 30k USD in 2019)

Skills: Python, C++, C, JavaScript, Java, MATLAB; PyTorch; Git; React, NodeJS; Firebase; Linux, Docker, GDB; CI/CD, Unit Testing