Muzhe Wu

734-358-7357 • henrw@umich.edu • 1835 Shirley Ln • Ann Arbor, MI 48105
henrywumz.github.io

Education

University of Michigan **Ann Arbor, MI**
Bachelor of Science in Computer Science *September 2021 - Present*

GPA 3.95/4.00
Relevant Coursework:
- Winter 2022: Intro to Machine Learning, Intro to NLP, Deep Learning for Computer Vision, Intro to Operating System
- Fall 2021: Data Structures and Algorithms, Intro to Computer Organization, Foundations of Computer Science, Intro to Probability and Statistics

Shanghai Jiao Tong University **Shanghai, China**
Bachelor of Science in Electrical and Computer Engineering *September 2019 - August 2021*

GPA 3.76/4.00
Relevant Coursework:
- Programming: Intro to Computer and Programming, Algorithms & Data Structures
- Math: Intro to Linear Algebra, Honors Mathematics II, III, IV, Discrete Mathematics
- Engineering Foundation: Intro to Engineering, Chemistry, Chemistry Lab, Honors Physics I, II, Physics Lab I, II

Competitions

Mathematical Contest in Modeling | Meritorious Winner Prize February 2021
- Modeled an ecosystem of different types of fungi (competitive relationships) with limited nutrient and simulated their long-term growth trends in various weather conditions.
- Applied Competitive LotkaVolterra Equations to formulate differential equations of fungi's growth; formulated correlation factors with geometry and necessary simplifications; evaluated weather factors with linear regression method; visualized simulation results in diagrams with MATLAB and Python.

University Physics Competition | Silver Medal November 2020
- Formulated a route for a lightweight spacecraft traveling from earth to Saturn at minimum fuel cost.
- Applied physics models, e.g. Conservation of Momentum, Kepler's Law and Hohmann Transfer Orbit to calculate the optimal track; established the relationships between fuel consumption and factors of the spacecraft's weight, distance and time with Euler's Method.

Projects

FAD: Feature Alignment Discriminator for Abstractive Text Summarization | NLP | *PyTorch* March 2022 - Present
- Introduced discriminator based on pre-trained BERT to BART text generator and designed aligned feature mechanism; achieved SOTA performance on CNN/DailyMail dataset for automatic abstractive text summarization.
- Data preprocessing; trained model with different settings (rDrop, different layer of features, hyperparameters, etc.); compared fine-tuned BART-base model (baseline); inference with ROUGE score.

Retro Game API for Reinforcement Learning | RL | *Gym, PyTorch* February 2022
- Developed an API for retro game simulation with reinforcement learning focus.
- Applied gym-retro integration tool to build runnable roms; designed a simulation environment with regulation user methods and compatible utility classes (recorder, interactor and dataset); designed a simulation GUI with observation and state information visualized; implemented wrapper classes for vision transform (random cropping, random convolution and gaussian noise).

Video Object tracker | CV | *Python, OpenCV* November 2021 - January 2022
- Created a program that detects an object initially within a selected region and tracks it throughout the video (classical method).
- Parsed video frames and extracted SIFT features with OpenCV module; applied DoG to image for noise reduction and keypoint magnification; implemented Kalman filter in parallel for movement prediction and correction; exported tracking video with keypoints and the tracker.

Mask Redistribution Simulator | Simulation | *C++, OpenGL* July 2020 - August 2020
- Created a program that evaluates the number of masks needed by cities in Hubei Province during the COVID-19 period and simulated the transportation of masks within the province along with subsequent impacts on pandemic situation.
- Applied the SIR model to classify people into different groups; set up parameters in accordance with factors of mask numbers, people's social distance, etc.; designed an interactive GUI that displays simulation results with OpenGL.

Technical Skills

Platforms: Ubuntu 20.04, macOS Monterey, Windows 10, 11
Languages: C, C++, Python, Java, Bash, HTML, CSS, Javascript, Swift, Latex, Verilog, Wolfram, R, Julia
Software: MATLAB, Mathematica, Git, Adobe Photoshop, Premiere, Origin Lab, Solidworks, Pspice

Volunteer & Extracurricular Experience

UMJI Voluntary Association, *Member* Fall 2019 – Summer 2020
Organzied visits to Jiangchuan Sunshine nursing house, caring people with mental difficulties.

SJTU Basketball Association, *Member* Summer 2020 – Summer 2021
Organized, refereed and competed in college basketball matches.

Honors

University of Michigan Dean's Honor List December 2021
Shanghai Jiao Tong University Undergraduate Excellent Scholarship November 2020, November 2021