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
- Honors: Dean's Honor List (Fall 2021, Winter 2022)
- Course Highlights: Machine Learning, Natural Language Processing, Computer Vision, Web Systems, Operating Systems, Data Structures and Algorithms, Computer Organization, Probability and Statistics, Extended Reality

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

- GPA: 3.76/4.00
- Honors: Undergraduate Excellent Scholarship (2019-2020, 2020-2021)
- Course Highlights: Linear Algebra, Discrete Mathematics, Calculus, Electronic Circuits, Modern Physics, Chemistry, Academic Writing

Research Experience

Multimodal Cognitive Tutor | HCI May 2022 - Present
Research Assistant, advised by Anhong Guo, Xu Wang
Highlights: Designed a tutoring system generalizable for 3D physical tasks learning (e.g. the Rubik's Cube), featuring multimodal input signals and users' knowledge states tracking. Backend built with OpenCV, YOLO object tracker model, etc.; frontend developed on Unity.

Misinformation Engagement Analysis | NLP, Multimodal Learning July 2022 - Present
Research Assistant, advised by Veronica Perez-Rosas
Highlights: Supervised learning with deep learning models of different modalities (visual, acoustic and text) to predict the engagement rate of YouTube videos on Prostate Cancer with misinformation. Models imported, modified and trained with PyTorch framework.

MineDojo | RL, NLP July 2022 - Present
Research Assistant, advised by Jim Fan
Highlights: Collect meta-dataset of task-oriented text datasets for zero-shot language model training; helped to enable GPU acceleration for RL simulation with EGL docker image.

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 Lotka Volterra 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.

Selected Projects

FAD: Feature Alignment Discriminator for Text Summarization | *https://github.com/zxp46/EECS487_Project_FAD* 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 layers of features, hyper-parameters, etc.); compared fine-tuned BART-base model (baseline); inference with ROUGE score.

Retro Game API for Reinforcement Learning | *Link: https://github.com/henrw/Pokemon-exercise* (private) 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).

Mask Distribution Simulator | *Link: https://github.com/henrw/VG101_project_MaskDistributionSimulator* July 2020 - August 2020

- Created a program in C++ 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.