Wenyu Li

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https://github.com/wenyuli23 (old: https://github.com/wenyuli08)

EDUCATION

Washington University in St Louis (WashU) St. Louis, MO
Master of Science in Computer Science May 2023
Certificate in Data Mining & Machine Learning December 2029
- **Cumulative GPA:** 3.9/4.0

University of Pittsburgh (Pitt) Pittsburgh, PA
Bachelor of Science in Computer Science, Mathematics (Second major) May 2021
Minor in German
- Graduated with Magna Cum Laude and Program Honor in *Computer Science*
- **Cumulative GPA:** 3.5/4.0
- **Honors:** Dean's list (Spring 2017, Fall 2019, Spring 2020)

RESEARCH EXPERIENCE

Deep Learning Models for Single-cell RNA-Seq Data Analysis, WashU Jun. 2022–Present
Advisor: Professor Yixin Chen, Professor Fuhai Li
- Performed single cell snRNA-seq and scRNA-seq data downstream analysis (clustering, differentially expressed genes analysis, etc.)
- Applied novel deep learning models, utilizing graph transformer-based graph neural network (GNN), to analyze single-cell RNA-seq data, to uncover the key or causal molecular targets and signaling pathways that are responsible for disease development and drug response

Deep Learning Model with Worst-Case Training for Recombination Hotspots Jun. 2022–Present
Advisor: Professor Haohan Wang
- Applied multi-head attention based deep learning model on large scale cross-species and cross-sex data with two-dimensional (sample & feature) Worst-Case Training to improve Out-of-domain Generalization
- Our method achieved the same performance as the same model structure + CHIP-seq information reinforcement

Machine Learning Models to Predict Adverse Event Following Orthopaedic Surgery Jun. 2022–Present
Advisor: Professor Haohan Wang, Professor Puneet Gupta
- Performed multiple machine learning model experiments, including XGBoost, RF, MLP, SVM, etc. on patient data post multi-ligament knee surgery
- Minimized the effect of imbalanced data
- Paper in progress

Deep Learning Configuration and Optimization on Medical Image Classification, WashU Jan. 2022 – May 2022
- Tested ResNet 50, ResNet 101, VGG19 and DenseNet169 models with spatial and channel attention on a breast histopathology images dataset about Invasive Ductal Carcinoma (IDC)

Advanced Data Management Technology Lab, University of Pittsburgh Apr. 2020–May 2021
Advisor: Professor Alexandros Labrinidis; Team PittSmartLiving, https://pittsmartliving.org/
- Project 1: Got-toilet-paper.org website
- Project 2: Multimodal route recommendation algorithm
- Designed Public information display (Python)
- Developed Mobile-friendly website using Port authority API, MySQL and Google geolocation API (Python)
- Conducted COVID field experiment to discover the relationship between COVID risk level and travel behaviors
- Regular independent supervision & decision making

Algorithm for Big Data, CIS Jul. 2020–Sep. 2020
Advisor: Professor David Woodruff (Carnegie Mellon University)
- Learned convex optimization, variations of gradient descent and submodular function
- Tested quantum layers in deep learning models
- Drafted the paper: *A Brief Review in Quantum Circuits and Tensor Network in Machine Learning*

The OurCS Conference, Carnegie Mellon University Oct. 2017
Advisor: Professor Robert Kraut
- Analyzed the text (keywords) in Kickstarter product descriptions to determine the type of pitches that leads to successful campaigns
- Used LightSIDE to predict the success of a Kickstarter project using unigrams, personal characteristics, and readability scores with an accuracy of 77.5% and kappa of 0.547

PUBLICATION

Zhengyang Xiao, **Wenyu Li**, Hannah Moon, Garrett W. Roell*, Yixin Chen*, and Yinjie J. Tang*, "Generative Artificial Intelligence GPT-4 Accelerates Knowledge Mining and Machine Learning for Synthetic Biology", *ACS Synth. Biol. 2023*, ISSN: 2161-5063

Wenyu Li, Jiarui Feng, Philip Payne, Yixin Chen, Fuhai Li*, "Decipher Macrophage-Fibroblast-Cardiomyocyte Signaling Interactions Associated with Heart Failure Using Deep Graph Neural Network Models and Single-cell RNA-seq Data", *bioRxiv,* Nov. 4, 2022

INTERNSHIP

Bentley System, Inc. – *Web Development Intern (40h/w)* Pittsburgh, PA
Project ALIM (Asset Lifecycle Information Management) Jun. 2019–Aug. 2019

- Set up local environment for web development via VS and debugged by cleaning/rebuilding it
- Used the Web Service Gateway to communicate between interfaces and plugins
- Construct controls in configuration files to adjust to our use of Kendo UI
- Created generic callback functions and to wait on service data in order to disable Route and Grid Action
- Worked with IE11 and Edge and debugged their inconsistency with Chrome and Firefox

UNIVERSITY ACTIVITIES

➢ **Teaching Assistant Experiences:**
CSE 514A Data Mining*, Dr. Cynthia Ma, WashU (2h/w), Aug. 2022–Dec. 2022*
CSE 412A Intro to AI, *Dr. William Yeoh & Dr. Athena M. Tabakhi, WashU (9h/w), Jan. 2022–Dec. 2022*
CS 449 Intro to Systems Software, *Dr. Sherif Khattab, Pitt (5h/w), Sep. 2020–Dec. 2020*

- Provided recitations to clarify difficult and ambiguous concepts, held weekly office hours, proctored exams, graded homework, projects and exams, attended weekly teaching staff meetings, etc.

➢ **Competitions:**

- SheInnovates: 2nd place
- German Poster Competition: 1st place

➢ **Study Abroad–Pitt in Munich, Germany,** *May 2019*

- Studied history, culture and society of Munich
- Took German language course with Goethe Institute

➢ **Emerging Leaders Program, University of Pittsburgh.** *Sep. 2016, Feb. 2017*

- Overcame challenges on group dynamics, diversity, conflict management, values and ethics, and power and influence
- Established leadership through a variety of group work

➢ **Volunteer for Arrival Survival, University of Pittsburgh,** *Aug. 2017 (20 hours)*

- Directed and provided help to new students and parents on campus

➢ **Member** of **Pitt Computer Science Club (CSC),** *Oct. 2017–May. 2021*
➢ **Member** of **Women in Computer Science (WiCS),** *Oct. 2017–May. 2021*
➢ **Member** of **Panther Equestrian Club,** *Aug. 2017–May 2019*

ADDITIONAL INFORMATION

➢ **Professional Skills:**

- Coding languages: Python, R, mathematica, SQL, Java, C, JavaScript, AngularJS, Matlab
- Bioinformatics skills: Seurat, scanpy
- Deep Learning skills: pytorch, sklearn, tensorflow

➢ **Languages:** Chinese (native), English (fluent), German (conversational)
➢ **Interests & Hobbies:** Traveling, Movies, Piano