

Pinze Yu

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EDUCATION

NEW YORK UNIVERSITY

New York, NY

B.A. in Computer Science and Mathematics, Minor in Business Studies

Sep 2020 – May 2024

Cumulative GPA: 3.827/4.0, **Upper Division GPA:** 3.926/4.0, **Math Major GPA:** 4.0/4.0

Relevant Courses: Intro to Machine Learning (A), Linear and Nonlinear Optimization (A), Ordinary Differential Equations(A), Numerical Computing(A, Rank 1)

Graduate-Level Courses: Computer Vision, Deep Learning

Skills: Python, Java, C, React, MATLAB, Julia

INTERNSHIP

Plaso Network Technology Co. Ltd.

Nanjing, Jiangsu, China

Software Engineering Intern

Dec 2021 – Jan 2022

- Develop and test software systems for an online educational platform to support local public schools during quarantine. Join weekly brainstorming sessions on software improvements, focusing on introducing valuable features for the online educational software.

Courant Institute of Mathematical Sciences

New York, NY

Teaching Assistant and Grader for Department of Mathematics

Sep 2023 – Now

- Grade homework assignments and provide feedback.
- Discuss with the professor regarding the course's evaluation and learning progression.

RESEARCH EXPERIENCE

Nanjing University Natural Language Processing Research Group

Jun 2023 – Aug 2023

Advisor: Yachong Guo (Associate Professor, Nanjing University)

- Implement classic local interpretability algorithms such as LIME, SHAP, Integrated Gradients, and LRP using Fairseq.
- Give a presentation on Integrated Gradients and its follow-up, XRAI.
- Evaluate Linear Decomposition, a novel local interpretability approach, by measuring the accuracy of each algorithm for specific sentences using RoBERTa on the SST-2 dataset.

Courant Institute of Mathematical Sciences, New York University

Apr 2023 – Now

Advisor: Michael L. Overton (Silver Professor of Computer Science & Mathematics, Deputy Chair of Computer Science Department)

- Implement QR factorization using the Householder transformation with the appropriate sign and show the robustness of Householder transformation method across different datasets.
- Observe unforeseen residual norm error when tested with an incorrect sign for the Householder reflector, attributed to the computed norm falling below the machine epsilon's square root.
- Analyze the stability and error of Householder computations, aiming to mathematically establish the connection between the unexpected residual norm error and the square root of machine epsilon.

PUBLICATIONS

[1] Michael L. Overton and Pinze Yu. **On the Choice of Sign Defining Householder Transformations (Submitted to Numerical Algebra, Control and Optimization)**

PROJECTS

German Traffic Sign Recognition Benchmark Challenge

Sep 2023 – Oct 2023

- Implement an innovative model that improves upon the baseline performance of recognizing German traffic signs. Participate in the Kaggle competition alongside graduate-level computer vision students, with a focus on improving accuracy scores on the test dataset.
- Apply techniques including data augmentation, spatial transformer network(STN), dropout, weight decay, and learning rate scheduler to improve the accuracy. Achieve a final leaderboard score of 0.9802 (**rank 1st of 112**).

Comparison of Different Optimization Algorithms

Apr 2023

- Implement Gradient Descent method using both constant and dynamically adjusted learning rates based on Armijo's rule, then evaluate their convergence robustness and convergence rate.
- Implement Newton's method with/without Hessian modification and backtracking, then evaluate their convergence robustness and convergence rate.
- Compare the convergence robustness and convergence rate between Gradient Descent method and Newton's method.

State Prediction of Robot Hand with Supervised Learning Algorithm

Dec 2022

- Train a supervised model using CNN to predict the positions of the tip of each finger on a robotic hand using top-view RGBD images.
- Improve the model performance by using ResNet, lower the MSE loss from 0.026 to 0.003.