Qilin Ye

yeqilin@usc.edu | +1 (858) 205-2077 | yql-skorpion.github.io

EDUCATION

University of Southern California, Los Angeles, CA   *September 2020 - Present*
    B.S. in Mathematics, with honors, GPA 4.00/4.00
    B.S. in Computer Science (2022 - present), GPA 3.94/4.00
    M.S. in Applied Mathematics (2021 - present), GPA 3.95/4.00
    Minor in musical studies (former piano major), under guidance of Dr. Lucinda Carver

RESEARCH EXPERIENCE

Directed Research in Natural Language Processing

Do Transformers Learn Algorithms? A Case Study on Graph Problems   *August 2023 - Present*

Ongoing thesis under Prof. Robin Jia and Prof. Vatsal Sharan, exploring Transformer models' ability to "learn" human-interpretable solutions to algorithmically-generated tasks. Pattern spotting and followup anlysis were done mostly after reverse engineering various Transformer models.

Improving Large Language Model Fact Editing via Localization Results   *April 2023 - July 2023*

Independent research supervised by Prof. Robin Jia, focusing on optimizing *knowledge editing* of LLMs. Utilized PyTorch and data analysis skills to reveal (i) *tracing effect* is a good indicator of successful edits and (ii) a statistically significant trade-off exists between robustness and precision.

Directed Research in Functional Analysis (Mathematics)   *December 2020 - May 2021*

Under Prof. Wojciech Ożański; independently derived an alternate proof to the Banach-Steinhaus Theorem.

PROJECTS & OTHER EXPERIENCE

CSCI-310: `PlanMyDay`   *Fall 2023 Semester*

An Android application designed for tourists to explore LA, particularly USC, and to plan their itineraries.

Contributed by implementing (i) an authentication system using Firebase, (ii) real-time traffic data retrieval, (iii) Google Maps API for route previews, and (iv) a clustering algorithm for optimizing multi-day trips.

CSCI-201: `DormUtils`   *Fall 2022*

A web application designed for college dorm mates to manage living expenses, featuring a synchronized shopping list and an internal algorithm for optimized cost distribution among members.

Contributed by designing and implementing (i) key front-end pages using HTML/CSS and (ii) the core "internal algorithm," drawing concepts from the "online load-balancing problem."

Author of Official Lecture Notes: MATH-425a (Real Analysis, *Fall 2021*), CSCI-270 (Algorithms, *Spring 2024*)

Also maintained (unofficial) LaTeX lecture notes over a dozen other other courses, publicly available here.

Teaching & Mentoring

Teaching Assistant, MATH-425a, Undergraduate Real Analysis I   *Fall 2021*
Supplemental Instructor (undergrad TA), MATH-226, Multivariable Calculus   *Fall 2021 & Spring 2022*

Also mentored dozens of students over a variety of upper-division and graduate courses throughout all semesters, most notably in mathematical analysis, statistics, and theory of algorithms.

RELEVANT SKILLS & COURSEWORK

Programming and Computing: Python (especially PyTorch), MATLAB, R; C, C++, Java/Kotlin, HTML/CSS; LaTeX.
Courses: Algorithm Theory || Machine Learning || Software Engineering || Android || Systems || Internetworking
Mathematics: Data Analysis || Statistical Inference || Stochastic Process || Mathematical Analysis (real, complex, functional) || Number Theory || Numerical Analysis || Measure Theory || Theoretical ML

AWARDS AND HONORS

Phi Beta Kappa   2022
Renaissance Scholar   2023
    · Awarded to USC undergraduates who pursue widely separate fields of studies