Yuqing Wang

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Employment

Postdoctoral Scholar — **Palo Alto, CA**
Stanford University - Biomedical Informatics — *10/2023 - Present*
Advisor: Prof. Tina Hernandez-Boussard

Education

University of California, Santa Barbara — **Santa Barbara, CA**
Ph.D. in Computer Science — *10/2020 - 9/2023*
Advisor: Prof. Linda Petzold
Disseration: AI and Big Data in Health: Boosting Reliability and Efficiency in Predictive Healthcare Models

University of Minnesota, Twin Cities — **Minneapolis, MN**
B.S. in Mathematics (*Distinction*) — *9/2016 - 5/2020*
Advisor: Prof. Kaitlin Hill
Coursework: Real Analysis, Abstract Algebra, Linear Programming, Nonlinear Optimization, Numerical Analysis, Matrix Theory, Ordinary Differential Equations, Probability Theory, Graph Theory, Machine Learning

Awards & Honors

Travel Award, Machine Learning for Healthcare Conference *2023*

Best Student Paper Award, 13th ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics *2022*

Best Paper Award Nominee, Industrial Conference on Data Mining *2022*

Best Paper Award, 9th Workshop on Data Mining in Biomedical Informatics and Healthcare *2021*

Academic Excellence Fellowship, UCSB *2020*

Undergraduate Research Scholarship, UMN *2018*

Maroon Global Excellence Scholarship, UMN *2016 - 2020*

Research Interests

- **Trustworthiness in Machine Learning:** Enhancing the reliability and adaptability of language models (LMs) in critical sectors, particularly in high-risk domains like healthcare, where inaccuracies can profoundly affect patient well-being.
- **Precision in Clinical Predictions:** Concentrating on refining the precision of LMs in clinical outcomes and policy recommendations to ensure both ethical and impactful patient care.
- **Efficiency in Diverse Applications:** Emphasizing the reliability and efficiency of LMs across multiple domains, ensuring timely, resource-efficient, and precise predictions.
- **Model Understanding and Integration:** Advancing human comprehension of LMs to enhance user trust and facilitate the seamless incorporation of artificial intelligence into decision-making workflows.

Research Experience

Postdoctoral Scholar **Palo Alto, CA**
Stanford University *10/2023 - Present*

- Developing predictive models for surgical risk assessment, alongside reinforcement learning algorithms to optimize postoperative pain management.

Doctoral Student Researcher **Santa Barbara, CA**
University of California, Santa Barbara *10/2020 - 9/2023*

- Investigated the intersection of machine learning (ML), natural language processing (NLP), and healthcare, focusing on advancing clinical language comprehension of large language models and developing novel prompting techniques to improve functionality.
- Developed predictive models based on physiological time series data combined with clinical notes commonly found in Electronic Health Records to improve the prediction of life-threatening outcomes such as sepsis and mortality.
- Applied reinforcement learning algorithms to policy learning in blood transfusion protocols, a pivotal treatment in critical care; this work was recognized with the Best Student Paper Award at ACM-BCB 2022.
- Dedicated to understanding ML model training phase and deep learning model architecture through module-wise analyses to enhance the model reliability and efficiency in practical applications.

Undergraduate Research Assistant **Minneapolis, MN**
University of Minnesota, Twin Cities *1/2017- 12/2019*

- Analyzed the resilience of the global food trade network in the face of climate change, generating a scale-free network, comparing it to actual networks, and assessing resilience by simulating hurricane impacts, analyzing graph characteristics, and comparing degree distributions.
- Examined the interrelationship between Native American students' interest in engineering and personality, identifying factors affecting their representation in engineering faculty positions, including financial barriers, academic challenges, and lack of familial support.

Publications

Yuqing Wang*, Prashanth Vijayaraghavan*, and Ehsan Degan. "PROMINET: Prototype-based Multi-View Network for Interpretable Email Response Prediction", in Conference on Empirical Methods in Natural Language Processing (EMNLP) Industry Track, Singapore, Dec. 2023.

Yuqing Wang and Yun Zhao. "TRAM: Benchmarking Temporal Reasoning for Large Language Models", in submission, 2023.

Haotian Xia, Rhys Tracy, Yun Zhao, **Yuqing Wang**, Yuan-Fang Wang, and Weining Shen. "Advanced Volleyball Stats for All Levels: Automatic Setting Tactic Detection and Classification with a Single Camera", in IEEE International Conference on Data Mining Workshop, Shanghai, China, Dec. 2023.

Yuqing Wang and Yun Zhao. "Metacognitive Prompting Improves Understanding in Large Language Models", in submission, 2023.

Yuqing Wang, Yun Zhao, and Linda Petzold. "An Empirical Study on the Robustness of the Segment Anything Model (SAM)", in submission, 2023.

Yuqing Wang, Yun Zhao, and Linda Petzold. "Are Large Language Models Ready for Healthcare? A Comparative Study on Clinical Language Understanding", in Machine Learning for Healthcare Conference, New York, USA, Aug. 2023.

Yuqing Wang, Yun Zhao, and Linda Petzold. "Predicting the need for blood transfusion in intensive care units with reinforcement learning", in ACM International Conference on Bioinformatics, Compu-

tational Biology and Health Informatics 2022, Chicago, USA, Aug. 2022. (Recipient of the **Best Student Paper Award**)

Yuqing Wang, Yun Zhao, and Linda Petzold. "Enhancing Transformer Efficiency for Multivariate Time Series Classification", in Industrial Conference on Data Mining, New York, USA, Jul. 2022. (Recipient of the **Best Paper Award Nominee**)

Yuqing Wang*, Yun Zhao*, and Linda Petzold. "Integrating Physiological Time Series and Clinical Notes with Transformer for Early Prediction of Sepsis", in Industrial Conference on Data Mining, New York, USA, Jul. 2022. (Recipient of the **Best Paper Award Nominee**)

Yuqing Wang*, Yun Zhao*, Junfeng Liu, Haotian Xia, Zhenni Xu, Qinghang Hong, Zhiyang Zhou, and Linda Petzold. "Empirical Quantitative Analysis of COVID-19 Forecasting Models", in IEEE International Conference on Data Mining Workshop, Auckland, New Zealand, Dec. 2021. (Recipient of the **Best Paper Award**)

Yuqing Wang*, Yun Zhao*, Rachael Callcut, and Linda Petzold. "Empirical Analysis of Machine Learning Configurations for Prediction of Multiple Organ Failure in Trauma Patients", in Industrial Conference on Data Mining, New York, USA, Jul. 2021.

Yun Zhao, Qinghang Hong, Xinlu Zhang, Yu Deng, **Yuqing Wang**, and Linda Petzold. "BERTSurv: BERT-Based Survival Models for Predicting Outcomes of Trauma Patients", in Industrial Conference on Data Mining, New York, USA, Jul. 2021.

Invited Talks & Presentations

"Towards AI-Assisted Healthcare", in Stanford University *2/2023*

"Towards AI-Assisted Healthcare", in Lawrence Livermore National Laboratory *1/2023*
"Arnold's cat map", in Mathematics Directed Reading Program *4/2019*

"The effect of climate change on the resilience of global food trade network", in 40th Annual Pi Mu Epsilon Undergraduate Conference *4/2019*

"Interrelationship between Native American students' interest in engineering and personality", in Summer Undergraduate Research Symposium *8/2018*

"A Story of Resilience: A Case Study of the Supports and Barriers for Native American Engineering Students", in Summer Undergraduate Research Symposium *8/2018*

Teaching Experience

Introduction to Computer Science (CS 8), Graduate Teaching Assistant *Summer 2021*
- At UCSB, assisted in developing quizzes and projects for a class of around 100 students, managed grading, and held regular office hours for answering questions.

Introduction to Programming (ENGR 3), Graduate Teaching Assistant *Spring 2021*
- At UCSB, held discussion sessions and regular office hours for a class of around 150 students.

Introduction to Computational Science (CS 111), Graduate Teaching Assistant *Fall 2020*
- At UCSB, ran discussion sessions and held regular office hours for a class of around 80 students.

Precalculus II (MATH 1151), Undergraduate Teaching Assistant *Spring 2019*
- At UMN, assisted in developing exams, conducted regular discussion sessions, and provided office hours for a class of around 120 students.

Precalculus I (MATH 1051), Undergraduate Teaching Assistant *Fall 2018*
- At UMN, assisted in grading exams, conducted regular discussion sessions, and provided office hours for a class of around 100 students.

Industry Experience

Research Intern **San Jose, CA**
IBM Research - Almaden *6/2022 - 9/2022*

- Developed a prototype-based multi-view network for interpretable email response prediction, providing explanations at document, sentence, and phrase levels.
- Conducted experiments on two real-world email datasets and the proposed model outperformed the strongest baselines with an improvement of about 3% in F1 score on both datasets.
- Contributed to enhancing sender-receiver communication and customer engagement in email interactions, leading to acceptance of this work at EMNLP 2023 Industry Track.

Data Analyst Intern **Minneapolis, MN**
Mid-America Business Systems *5/2018 - 12/2019*

- Performed advanced analytics functions, including data modeling and prescriptive analytics.
- Developed SQL queries and scripts to extract, transform, and load data from various sources into a centralized data warehouse.
- Conducted triage and root cause analysis, implementing solutions for data-related issues as reported by customers.

Volunteer & Community Service

Stanford Natural Language Processing Group Member *10/2023 - Present*
Women in Science and Engineering Member, UCSB *10/2020 - 9/2023*
Computer Science Graduate Representative (only Female member), UCSB *10/2020 - 10/2021*
Society of Asian Scientists and Engineers Member, UMN *9/2017 - 5/2020*
Girls Who Code Teaching Assistant, UMN *9/2017 - 1/2019*
Feed My Starving Children Volunteer, UMN *5/2017 - 5/2019*
Women in Science and Engineering Initiative Member, UMN *9/2016 - 5/2020*
First-Year Leadership Institute Member, UMN *9/2016 - 5/2017*

Professional Service

Conference Reviewer: ICLR, NeurIPS, ACM-BCB *2022 - 2023*
Journal Reviewer: Patterns *2023*
Secondary Conference Reviewer: EMNLP, IEEE ICDM, AAAI *2021*

Technical Skills

Computer Languages: Python, R, MATLAB, Java
Databases: MySQL, Microsoft SQL
Deep Learning Frameworks: Pytorch, Tensorflow