Jiaji Ma

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EDUCATION

University of Michigan   Ann Arbor, MI

Ph. D in Computer Science and Engineering   Aug 2024 – Present

University of Virginia   Charlottesville, VA

B.S. in Computer Science, B.A. in Applied Statistics   Aug 2021 – May 2024

GPA: 3.895/4.0

RESEARCH EXPERIENCE

Oak Ridge National Laboratory   Oak Ridge, TN

Research Intern, Data and AI Systems Section   Aug 2023 – Apr 2024

- Conducted research on enhancing the DrugMatrix toxicogenomic database by leveraging graph machine learning techniques. Proposed novel metric to characterize drug molecules based on interaction with genes, to uncover latent patterns within the data.
- Developed efficient graph attribute prediction and representation framework to tackle dimensionality challenges. Contributed to improving the accuracy and utility of the drug molecule functional profile predictions on unseen molecules and producing high-quality vector representations useful for down-stream tasks including clustering.

Research Intern, Mathematics in Computation Section   May 2023 – Jul 2023

- Proposed a novel graph representation learning framework, by integrating Graph Isomorphism Networks and Siamese autoencoders, to produce efficient vector representations for chemical molecular graphs.
- Contributed to enhancing the accuracy and efficiency of chemical molecule similarity tasks, yielding notable enhancements in comparison to baseline methods. Demonstrated the practical utility of the proposed framework in real-world contexts such as drug discovery, underlining its potential in expediting the identification of compounds optimized for specific attributes.

The University of Virginia   Charlottesville, VA

Undergraduate Research Assistant   Oct 2022 – May 2024

- Conducted geospatial intelligence research projects encompassing the realms of trajectory data mining, geospatial analytics, and their tangible applications.
- Formulated and implemented analytical frameworks into multiple fields. Including investigations into the nuanced individual-level responses of rural residents to hospital closures, as well as the dynamic movement patterns of residents in food deserts.

The University of Delaware   Newark, DE

Research Intern   Jun 2022 – Aug 2022

- Conducted research on equitable facility access, culminating in the conceptualization and proposition of a novel probabilistic framework for assessing community vulnerability utilizing network modeling techniques that seeks to solve challenges in urban planning and resource allocation.
- Constructed a model employing state-of-the-art graph algorithms and metaheuristic optimization methodologies to effectively address the intricate challenges posed by large-scale dynamic facility location problem.

TEACHIING EXPERIENCE

University of Virginia   Charlottesville, VA
Undergraduate Teaching Assistant
- CS 3130 Computer Systems and Organization 2 (Aug 2023 – May 2024)
- CS 2130 Computer Systems and Organization 1 (Aug 2022 - May 2023)

HONORS & AWARDS

Dean's List Fall 2021, Spring 2022, Fall 2022, Spring 2023, Spring 2024

PUBLICATIONS

- **Ma. J.**, & Lim, S. H. (2023, September). Efficient graph representation framework for chemical molecule similarity tasks. In 2023 IEEE Sixth International Conference on Artificial Intelligence and Knowledge Engineering (AIKE) (pp. 113-120). IEEE.
- **Ma, J.**, Gangwal, U., & Dong, S. (2023, November). Fire station accessibility assessment and improvement considering probabilistic road failure in facing flooding. In 2023 ASCE Inspire.
- **Ma. J.**, & Cong, G., & Auerbach, S. S. (2023, December). Clustering and GNN prediction with DrugMatrix. IEEE BigData International Workshop on Data-driven Science for Graphs: Algorithms, Architectures, and Application. IEEE.

PROFESSIONAL ACTIVITIES

- Reviewer, IEEE Transactions on Big Data (7.2 Impact Factor)
- Reviewer, 22nd and 23rd IEEE International Conference on Machine Learning and Applications (ICMLA)
- Oral Presentation, Mathematics in Computation Section at Oak Ridge National Laboratory
- Poster Symposium, DOE SULI program at Oak Ridge National Laboratory
- Poster Symposium, NSF REU program at University of Delaware