

Luka Jovanović

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Education

Northeastern University | Boston, MA
Khoury College of Computer Sciences

B.Sc. Computer Science, Sep 2020 - May 2023

- GPA: 3.7
- Concentration: Software Engineering
- Minor: Mathematics

M.Sc. in Computer Science, Sep 2023 – Present

- GPA: 3.9
- Concentration: Artificial Intelligence

Awards

- Honors Society Scholarship
- Research Scholarship
- Dean's List 2021, 2022, 2023

Projects & Contributions

Enhancing Out-Of-Distribution Accuracy in Code Completion via Data Augmentation 🐙

- Led an innovative research project focusing on the advancement of code completion models in software development, addressing the critical issue of distribution-shift by utilizing the WILDS project's framework of aggregated data from thousands of GitHub repositories.
- Pioneered the application of data augmentation techniques on training datasets to introduce variability and improve out-of-distribution predictions in code completion models, contributing to the field's understanding of model robustness.
- Conducted comprehensive analyses which revealed limitations of standard code augmentation techniques in expanding training set distributions, culminating in valuable recommendations for future research to explore more sophisticated augmentations for realistic code modeling.

McMini: Model Checker for Multithreaded programs 🐙

- Developed McMini, an advanced, extensible model checker using Dynamic Partial Order Reduction, tailored for efficient analysis of multi-threaded programs.
- Integrated a unique feature in McMini allowing users to define and optimize new thread operations, significantly accelerating model checking and reducing computational overhead.
- Expanded McMini's capabilities to model diverse thread wakeup policies, including spurious wakeups, enabling more accurate simulation of operating system and thread library behaviors for robust multi-threaded program debugging.

Papers

1. M. Pirtle, L. Jovanovic, and G. Cooperman, "McMini: A Programmable DPOR-based Model Checker for Multithreaded Programs", Programming Journal, vol. 8.1 🐙
2. M. Becker and L. Jovanovic, "Enhancing Out-Of-Distribution Accuracy in Code Completion via Data Augmentation" 🐙

Work Experience

Researcher, Califano Lab at Columbia University, March 2024 - Present

- Conducted research on computational methods for single-cell RNA sequencing to enhance precision therapy in cancer treatment.
- Developed and implemented sophisticated machine learning models to analyze single-cell RNA sequencing data.
- Collaborated with interdisciplinary teams to integrate and interpret complex datasets, contributing to the design of innovative algorithms for cancer therapies.
- Applied cutting-edge methods like ARACNe and VIPER to uncover key regulatory networks and inform personalized treatment strategies.
- Worked on advanced data analytics and predictive modeling to unravel complex biological patterns and enhance the accuracy and efficiency of protein sequencing predictions.

Researcher, High Performance Computing Lab at Khoury College, Dec 2021 - Present

- Worked on new methods for model checking of multi-threaded programs.
- Authored and published a research paper detailing novel findings in the domain of model checking.
- Utilized state-of-the-art HPC resources, including supercomputers and parallel computing clusters, for large-scale experiments.
- Participated in weekly lab meetings to discuss progress, challenges, and brainstorm solutions.
- Contributed to the development of open-source tools and libraries, promoting the wider dissemination of the lab's research.

Technical Knowledge

Languages: Python, R, C#, Java, TypeScript, Racket
SQL, C, C++, Assembly, LaTeX
Tools: Git, Visual Studio, JetBrains IDEs
Eclipse, Bash, Racket Editor
Systems: Linux/Unix, macOS, Windows