Leyli (Aya) Garryyeva

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Research Interest

I develop causal-neurosymbolic methods to make AI models for software engineering tasks more interpretable and trustworthy. My work leverages causal inference and symbolic reasoning to evaluate and improve Language Model performance for code-related tasks.

Publications

Alejandro Velasco, *Aya Garryyeva*, David N. Palacio, Antonio Mastropaolo, Denys Poshyvanyk; **Toward Neurosymbolic Program Comprehension**; ICPC'25 ERA track

[Daniel Rodriguez-Cardenas, *Aya Garryyeva*, David N. Palacio]*, Antonio Mastropaolo, Denys Poshyvanyk; **Towards a Theory of Causation for Software Experiments**; *Manuscript in Preparation* (* authors contributing equally)

Education

William & Mary — *Williamsburg, VA*
Ph.D. Candidate, Computer Science. GPA: 3.96/4.00 — *Expected: 05/2027*
Advisors: Antonio Mastropaolo and Denys Poshyvanyk

William & Mary — *Williamsburg, VA*
M.S. in Computer Science — *12/2019*
Honors: Graduate Studies Advisory Board Fellowship

Wingate University — *Wingate, NC*
B.S. in Mathematics, Minors in Economics and Finance — *05/2017*

Skills

AI/ML: Causal Inference, Neurosymbolic Methods, LLM Fine-Tuning (PyTorch), CUDA
Languages: Python, R, SQL
Tools: GitHub, Azure Databricks, Jira, LaTeX

Professional Experience

Holland America Line, Data Scientist , Seattle, WA — *04/2021 - 09/2023*
R, SQL, Snowflake, Jira, Github, Machine Learning, Data Mining, Time Series Forecasting

- Developed machine learning models, including customer churn prediction and demand forecasting, to guide product improvements and marketing strategies.
- Worked cross-functionally with data scientists and product managers to improve demand forecast in highly uncertain times and optimize revenue strategies.

Microsoft, Software Engineer - Contractor, Redmond, WA — *06/2020 - 04/2021*
Azure Databricks, KQL, Software Testing, Technical Writing

- Worked as a contractor for Quadrant Resource during my time at Microsoft, bringing valuable expertise to the development and improvement of the Azure Databricks platform.
- Utilized Kusto Query Language (KQL) to perform data analysis for root cause identification and more efficient triaging of the reported problems within Azure Databricks applications.

Projects

Causal Repair of Code Language Models — *03/2025 - Present*
Pre-Post LLM Evaluation in Software Engineering — *09/2024 - 12/2024*
Domain Adaptation for Image Segmentation, — *02/2024 - 05/2024*
Evaluation of Bugs in Software Defined Vehicles — *9/2023 - 12/2023*

Leadership & Service

Mentored a student with **Minds Matter Seattle** | Seattle, WA — 2021-2022
Served as an Instructor with **Girls Who Code** | Charlotte, NC — *2019*
Founder and President of the **Model United Nations Club** | Wingate University — 2014-2017

Activities

Computing Research Association (CRA) Grad Cohort for Women — *2024*
Society of Women Engineers (SWE) — *2023 - present*