# Will Leeson

Assistant Professor, St. Olaf College

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My research interests lie at the intersection of software engineering and machine learning. There are many heuristics in software engineering that are based on expert intuition. Graph representations of programs are rich with information and are frequently used as the underlying representations of the problem these heuristics are used to solve. I develop graph representations and machine learning models to learn replacements for these heuristics.

## Education

2019 – 2024   **University of Virginia**, USA
Ph.D. Computer Science
Advisor: Dr. Matthew B. Dwyer
Dissertation: Learning to Improve Program Analysis Using Graph Representations

2015 – 2019   **Drake University**, USA
B.S. in Computer Science
B.S. in Data Analytics

## Experience

2024 –   Assistant Professor, Department of Math, Statistics, and Computer Science, St. Olaf College
2019 – 2024   Research Assistant, Less Lab, University of Virginia (less-lab-uva.github.io)
2017 – 2019   Research Assistant, Drake University

## Honors & Awards

2023   **Distinguished Paper Award**
ACM SIGSOFT

2021   **Department of Computer Science Outstanding Teaching Awards**
University of Virginia

## Publications

2024   **Will Leeson** and Matthew B Dwyer, "Algorithm selection for software verification using graph neural networks," *ACM Transactions on Software Engineering and Methodology*, vol. 33, no. 3, pp. 1–36, 2024

2023   **Will Leeson**, Matthew B Dwyer, and Antonio Filieri, "Sibyl: Improving Software Engineering Tools with SMT Selection," in *2023 IEEE/ACM 45th International Conference on Software Engineering (ICSE)*, IEEE, 2023, pp. 2185–2197

2022   **Will Leeson** and Matthew B Dwyer, "Graves-CPA: A graph-attention verifier selector (competition contribution)," in *International Conference on Tools and Algorithms for the Construction and Analysis of Systems*, Springer, 2022, pp. 440–445

2019    **William Leeson**, Adam Resnick, Daniel Alexander and John Rovers, "Natural Language Processing (NLP) in qualitative public health research: a proof of concept study," *International Journal of Qualitative Methods*, vol. 18, p. 1 609 406 919 887 021, 2019

## Invited Talks

2023    **Will Leeson** "Do What I Want, Not What I Say: Proving Software Acts According to Plan", Carleton College, March 9 2023

## Service

2024    **Reviewer**, ACM Transactions on Software Engineering and Methodology
2022 – 2023    **Jury Member**, Competition on Software Verification (SV-Comp)
2022 – 2023    **Graduate Mentor**, Department of Computer Science Graduate Mentorship Program
2021    **Student Volunteer**, International Conference on Software Engineering (ICSE)

## Teaching

Fall 2024    Primary Instructor, **Programming Languages**, St. Olaf College
Fall 2024    Primary Instructor, **Software Design**, St. Olaf College
Fall 2023    Primary Instructor, **Introduction to Information Technology**, University of Virginia
Spring 2023    Primary Instructor, **Introduction to Information Technology**, University of Virginia

## Mentorship

Summer 2023    **Alexis Davis**, Summer REU student
*"Using LLMs to create formal specifications from natural language requirements"*
2022-2023    **Khyati Kiyawat**, PhD student at the University of Virginia
Department of Computer Science Graduate Mentorship Program
2022-2023    **Daniel Hieber**, Master student at the University of Virginia
Department of Computer Science Graduate Mentorship Program

# References

**Matthew B Dwyer** (Advisor)
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