

# Nathan Cooper

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## Research Interests

Intersection of software engineering (SE) and artificial intelligence (AI), i.e., AI4SE and SE4AI. Specifically, research of AI4SE that interest me are information retrieval, collaborative developer tools, and question & answering systems. For SE4AI, research involving deep learning model testing and interpretability, development life-cycles of AI software systems, and AI software system architectures.

## Education

### College of William and Mary

PH.D. IN COMPUTER SCIENCE

Williamsburg, VA

2018 - 2023

### University of West Florida

B.S. IN SOFTWARE ENGINEERING

Pensacola, FL

2015 - 2018

## Experience

### College of William and Mary

RESEARCH ASSISTANT

Williamsburg, VA

Fall 2018 - Present

### Auburn University

UNDERGRADUATE RESEARCH ASSISTANT

Auburn, AL

Summer 2017

### University of West Florida

UNDERGRADUATE RESEARCH ASSISTANT

Pensacola, FL

Fall 2015 - Summer 2018

## Honors & Awards

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|---------|---|------------------|
| 2021    | <b>S. Laurie Sanderson Award for Excellence in Undergraduate Mentoring</b> , Outstanding undergraduate mentoring in scholarship and research outside of classroom teaching. | Williamsburg, VA |
| 2020-21 | <b>Virginia Space Grant Consortium (VSGC) Fellowship</b> , Researching the application of graph neural networks to solve software engineering tasks. (on going)             | Williamsburg, VA |
| 2018    | <b>3rd Place</b> , UWF's CodeFest: Developed a multiple player android app named Discoverers to inspire people to learn more about their planet's geography.                | Pensacola, FL    |
| 2017    | <b>Outstanding Student Award</b> , at UWF   | Pensacola, FL    |

## Journal Publications

- M. Ciniselli, **N. Cooper**, L. Pascarella, A. Mastropaolo, E. Aghajani, D. Poshyanyk, M. Di Penta, G. Bavota, "An Empirical Study on the Usage of Transformer Models for Code Completion," In IEEE Transactions on Software Engineering (TSE), 2022
- C. Watson, **N. Cooper**, D. Palacio, K. Moran, D. Poshyanyk, "Systematic Literature Review on the Use of Deep Learning in Software Engineering Research," In ACM Transactions on Software Engineering and Methodology (TOSEM), 2022
- N. Wilde, B. Eddy, K. Patel, **N. Cooper**, V. Gamboa, B. Mishra, K. Shah, "Security for Devops Deployment Processes: Defenses, Risks, Research Directions," In International Journal of Software Engineering & Applications (IJSEA), Nov. 2016

## Conference Publications

- 2022**
- A. Ami, **N. Cooper**, K. Kafle, K. Moran, D. Poshyanyk, A. Nadkarni, "Why Crypto-detectors Fail: A Systematic Evaluation of Cryptographic Misuse Detection Techniques," In Proceedings of the 43rd IEEE Symposium on Security and Privacy (Oakland'22), 2022
- 2021**
- N. Cooper**, C. Bernal-Cárdenas, O. Chaparro, K. Moran, and D. Poshyanyk, "It Takes Two to Tango: Combining Visual and Textual Information for Detecting Duplicate Video-Based Bug Reports," in Proceedings of the 43nd IEEE/ACM International Conference on Software Engineering (ICSE'21), Virtual (originally Madrid, Spain), 2021.
  - M. Ciniselli, **N. Cooper**, L. Pascarella, D. Poshyanyk, M. Di Penta, and G. Bavota, "An Empirical Study on the Usage of BERT Models for Code Completion," in Proceedings of the 18th IEEE/ACM Conference on Mining Software Repositories (MSR'21), Virtual (originally Madrid, Spain), May 17th - 19th, 2021.
  - A., Mastropaolo, S., Scalabrino, **N. Cooper**, D., Palacio, D., Poshyanyk, R., Oliveto, and Bavota, G., "Studying the Usage of Text-To-Text Transfer Transformer to Support Code-Related Tasks," in Proceedings of the 43nd IEEE/ACM International Conference on Software Engineering (ICSE'21), Virtual (originally Madrid, Spain), 2021.

## 2020

- C. Bernal-Cárdenas, **N. Cooper**, K. Moran, O. Chaparro, A. Marcus, and D. Poshyvanyk, "Translating Video Recordings of Mobile Apps into Re-playable Scenarios," in Proceedings of the 42nd IEEE/ACM International Conference on Software Engineering (ICSE'20), Virtual (originally Seoul, South Korea), 2020. (20% acceptance rate) - **ACM SIGSOFT Distinguished Paper Award**

## 2017

- B. Eddy, N. Wilde, **N. Cooper**, B. Mishra, V. Gamboa, K. Shah, A. Deleon, N. Shields, "A Pilot Study on Introducing Continuous Integration and Delivery into Undergraduate Software Engineering Courses," In Proceedings of the IEEE 30th Conference on Software Engineering Education and Training (CSEE&T'17), Savannah, Georgia, 2017
- B. Eddy, N. Wilde, **N. Cooper**, B. Mishra, V. Gamboa, K. Patel, K. Shah, "CDEP: Continuous Delivery Educational Pipeline," In Proceedings of the ACM SouthEast Conference (SE'17), Kennesaw, Georgia, 2017

## Teaching Experience

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### CS420/520 Neural Networks for Machine Learning (Undergraduate & Graduate)

TEACHING ASSISTANT: GRADED ASSIGNMENTS AND HOSTED OFFICE HOURS

*College of William and Mary*

*Fall 2019, Spring 2020*

### CS435 Software Engineering (Undergraduate)

INVITED LECTURER AND PROJECT LEAD

*College of William and Mary*

TEACHING ASSISTANT: GRADED ASSIGNMENTS AND HOSTED OFFICE HOURS

*Fall 2019*

### CS241 Data Structures (Undergraduate)

TEACHING ASSISTANT: GRADED ASSIGNMENTS AND HOSTED OFFICE HOURS

*College of William and Mary*

*Fall 2018, Spring 2019*

### ACM Club's Machine Learning Workshop

PRESENTER

*University of West Florida*

*Fall 2016, Spring 2017*

### Computer Science Tutor

ASSISTED STUDENTS WITH VARIOUS PROGRAMMING LANGUAGES AND PRESENTED AND ORGANIZED FRESHMAN LEVEL

*University of West Florida*

WORKSHOPS FOR STUDENTS IN BEGINNER PROGRAMMING AND DATABASE CLASSES

*Spring 2016 - Fall 2017*

## References

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### Associate Professor Denys Poshyvanyk (Advisor)

*College of William & Mary*

CLASS OF 1953 TERM DISTINGUISHED ASSOCIATE PROFESSOR

- **Position:** Associate Professor of Computer Science
- **Email:** denys@cs.wm.edu
- **Phone:** (757) 221-3476