

# Sarah M. Fakhoury

DOCTORAL CANDIDATE IN COMPUTER SCIENCE

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Research Interests: Empirical Software Engineering, Program Comprehension, Applications of Cognitive Neuroscience.

## Education

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### Washington State University

PH.D. IN COMPUTER SCIENCE

- Doctoral committee: Dr. Venera Arnaoudova, Dr. Janardhan Doppa, Dr. Olusola Adesope

Washington, USA

Aug 2017 - May 2022 (Expected)

### American University of Beirut

BACHELOR OF SCIENCE IN COMPUTER SCIENCE

Beirut, Lebanon

Aug. 2013 - May 2016

## Peer Reviewed Publications

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### CONFERENCE PAPERS

#### Reassessing Automatic Evaluation Metrics for Code Summarization Tasks

ESEC/FSE 2021

ROY, D., FAKHOURY, S., ARNAOUDOVA, V.

- In Proceedings of the 26th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE).

#### Gazel: Supporting Source Code Edits in Eye-Tracking Studies.

ICSE DEMO 2021

FAKHOURY, S., ROY, D., PINES, H., CLEVELAND, T., PETERSON, C., ARNAOUDOVA, V., SHARIF, B., MALETIC, J.

- In Proceedings of the 43rd ACM/IEEE International Conference on Software Engineering, Demonstrations Track (ICSE).

#### A Model to Detect Readability Improvements in Incremental Changes.

ICPC 2020

ROY, D., FAKHOURY, S., LEE, J., ARNAOUDOVA, V.

- In Proceedings of the International Conference on Program Comprehension (ICPC).

#### VITALSE: Visualizing Eye Tracking and Biometric Data.

ICSE DEMO 2020

ROY, D., FAKHOURY, S., ARNAOUDOVA, V.

- In Proceedings of the International Conference on Software Engineering, Demonstrations Track (ICSE).

#### Improving Source Code Readability: Theory and Practice.

ICPC 2019

FAKHOURY, S., ROY, D., HASSAN, A., ARNAOUDOVA, V.

- In Proceedings of the International Conference on Program Comprehension (ICPC).

#### Moving Towards Objective Measures of Program Comprehension

ESEC/FSE 2019

FAKHOURY, S.

- In Proceedings of the Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE).

#### The Effect of Poor Source Code Lexicon and Readability on Developers' Cognitive Load.

ICPC 2018

FAKHOURY, S., MA, Y., ARNAOUDOVA, V., ADESOPE, O.

- In Proceedings of the International Conference on Program Comprehension (ICPC). **Distinguished Paper Award.**

#### Automatic classification of software artifacts in open-source applications.

MSR 2018

MA, Y., FAKHOURY, S., CHRISTENSEN, M., ARNAOUDOVA, V., ZOGAAN, W., MIRAKHORLI, M.

- In Proceedings of the Working Conference on Mining Software Repositories (MSR).

## Keep it simple: is deep learning good for linguistic smell detection?

SANER RENE 2018

FAKHOURY, S., ARNAOUDOVA, V., NOISEUX, C., KHOMH, F., ANTONIOL, G.

- In Proceedings of the International Conference on Software Analysis, Evolution, and Reengineering (SANER)—REproducibility Studies and NEgative Results (RENE) Track.

## JOURNAL PAPERS

### Measuring the Impact of Inconsistencies on Developers' Cognitive Load During Bug Localization.

EMSE 2019

FAKHOURY, S., ROY, D., MA, Y., ARNAOUDOVA, V., ADESOPE, O.

- Empirical Software Engineering (EMSE).

## Research and Professional Experience

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### Microsoft Research

Remote

RESEARCHER (PROJECT CONTRACT)

June 2021 - Current

- Teams: Research in Software Engineering, Productivity and Intelligence, SAINTES
- Mentors: Dr. Christian Bird, Dr. Shuvendu Lahiri, Dr. Todd Mytkowicz

### Microsoft Research

Remote

RESEARCH INTERN

Feb 2021 - May 2021

- Teams: Research in Software Engineering, Productivity and Intelligence, SAINTES
- Mentors: Dr. Christian Bird, Dr. Shuvendu Lahiri, Dr. Todd Mytkowicz
- Conducted interviews and survey on merge conflict resolution tools
- Presented a case study of merge conflict resolution at scale and prepared conference publication

### Microsoft

Redmond, WA

DATA AND APPLIED SCIENTIST INTERN

January 2019 - July 2019

- Team: Data and AI
- Mentors: Dr. Neel Sundaerson and Dr. Xi Cheng
- Developed Roslyn analyzers for the detection of linguistic antipatterns in C# source code.
- Conducted large scale analysis of code reviews in Microsoft repositories.
- Interviewed developers on their experiences and perspectives on existing tooling support and presented findings internally

### Washington State University

Pullman, WA

GRADUATE RESEARCH ASSISTANT

Aug 2016 - Current

- Software Engineering Laboratory
- Advised by Dr. Venera Arnaoudova

### Washington State University

Pullman, WA

GRADUATE TEACHING ASSISTANT

Aug 2017 - May 2018

- CPTS 487: Software Design and Architecture
- CPTS 451: Introduction to Database Systems
- CPTS 223: Advanced Algorithms C/C++

### American University of Beirut

Beirut, Lebanon

CAREER PLACEMENT SERVICES SOFTWARE DEVELOPMENT INTERN

Jan 2016 - May 2016

### Business Empower

Beirut, Lebanon

SOFTWARE DEVELOPMENT INTERN

June 2015 - Aug 2015

## Invited Talks

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## Manning Publications Developer Productivity Conference

MIND OVER CODE: USING NEURAL IMAGING TO REDUCE THE COGNITIVE BURDEN OF YOUR CODE

[\[Link to talk\]](#)

Virtual

June 2021

## Microsoft Research

CAN WE RESOLVE MERGE CONFLICTS AT SCALE?

Research Presentation

Virtual

May 2021

## Microsoft

A CASE STUDY OF CODE SMELLS IN DEVDIV REPOSITORIES

Research Presentation

Redmond, WA

June 2019

## Recognizing and Rewarding Open Science in Software (ROSE)

A PARTIAL REPRODUCTION OF IMPROVING CODE: THE (MIS) PERCEPTION OF QUALITY METRICS

ROSE Festival, co-located with ICSE

Montreal, Canada

May 2019

## Washington State Univeristy

MODELING THE COGNITIVE PROCESSES OF DEVELOPERS

Guest Seminar for Dr. Dave Bakken's CPTS 500: Proseminar Class

Pullman, WA

Dec 2018

## TU Delft

BRAIN IMAGING TECHNIQUES IN SOFTWARE ENGINEERING

Guest lecture in Dr. Feliene Hermans' Psychology of Programming Class

Delft, The Netherlands

Nov 2018

## Recognizing and Rewarding Open Science in Software (ROSE)

A REPLICATION OF "EASY OVER HARD: A CASE STUDY ON DEEP LEARNING"

ROSE Festival, co-located with ESEC/FSE

Lake Buena Vista, FL

Nov 2018

## Fellowships and Grants

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**\$122,000** Microsoft Research Ph.D. Fellowship Program, 2020-2022

**\$1000** Mahmoud M. Dillsi Family Graduate Fellowship, 2020

**\$6000** MUREX MurExcellence Grant for Academic Achievement, 2016

## Honors and Awards

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2020-22 **Fellow**, Microsoft Research Ph.D. Fellowship

Pullman, WA

2021 **Recipient**, CAPS Funding to attend the International Conference on Software Engineering

Pullman, WA

2020 **Outstanding Graduate Student Researcher**, Washington State University

Pullman, WA

2020 **Fellow**, Mahmoud M. Dillsi Family Graduate Fellowship

Pullman, WA

2018 **ACM SIGSOFT Distinguished Paper Award**, International Conference on Program Comprehension

Gothenburg, SE

2018 **Scholarship Recipient**, Grace Hopper Celebration Scholar

Houston, TX

2018 **Travel Scholarship Recipient**, National Science Foundation for ESEC/FSE

Orlando, FL

2018 **Travel Scholarship Recipient**, National Science Foundation for SWAN

Orlando, FL

2016 **Best Capstone Project Award**, American University of Beirut

Beirut, LEB

2013-16 **Dean's Honor Roll**, American University of Beirut

Beirut, LEB

## Research Mentoring

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<b>Subashree Venkatasubramanian</b>	Current - Pullman Highschool student
<b>Anthony Nguyen</b>	Current - WSU undergraduate student
<b>Harry Pines</b>	Supporting source code edits for eye tracking studies - WSU undergraduate student
<b>Tyler Cleveland</b>	Supporting source code edits for eye tracking studies - WSU undergraduate student
<b>Tala Karaki</b>	Systematic literature review, fNIRS in Cognitive Science - WSU undergraduate student
<b>Adnan Hassan</b>	Improving source code readability - PhD student at Virginia Tech
<b>Ziyi Zhang</b>	Washington State University 2nd year PhD Student
<b>Micheal Christensen</b>	Washington State University Masters Student
<b>Devjeet Roy</b>	Washington State University Senior Design - now PhD student at WSU
<b>Kyle Tilton</b>	Washington State University Senior Design
<b>Keon Sadatian</b>	Washington State University Senior Design - now at Indeed
<b>Nehemiah Vastinsalo</b>	Washington State University Senior Design
<b>Thom Hemenway</b>	Washington State University Senior Design - now at Expedia

## Professional Service

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### ORGANIZING COMMITTEES

- 2022 **Social Chair**, International Conference on Program Comprehension (ICPC)
- 2021 **Virtualization Chair**, International Conference on Source Code Analysis and Manipulation (SCAM)
- 2020 **Student Volunteer**, International Conference on Software Engineering (ICSE)
- 2021 **Student Volunteer**, International Conference on Software Engineering (ICSE)

### REVIEWER

- 2019-20 **Reviewer**, Transactions on Software Engineering (TSE)
- 2018-20 **Reviewer**, Software Quality Journal (SQJ)
- 2020-21 **Reviewer**, Journal of Systems and Software (JSS)
- 2019-20 **Reviewer**, Journal of Software: Evolution and Process (JSME)
- 2020 **Reviewer**, Eye Tracking Research and Applications (ETRA)
- 2019 **Reviewer**, ACM Conference on Human Factors in Computing Systems (CHI)

### EXTERNAL REVIEWER

- 2019-21 **External Reviewer**, International Conference on Software Engineering (ICSE)
- 2018-21 **External Reviewer**, International Working Conference on Mining Software Repositories (MSR)
- 2017-21 **External Reviewer**, International Conference on Program Comprehension (ICPC)
- 2018-21 **External Reviewer**, International Conference on Source Code Analysis and Manipulation (SCAM)
- 2018-21 **External Reviewer**, International Conference on Software Maintenance and Evolution (ICSME)
- 2017-19 **External Reviewer**, International Conference on Software Analysis, Evolution, and Reengineering (SANER)

### OTHER SERVICE

- 2020-21 **EECS Senator**, Washington State University Graduate and Professional Student Association (GPSA)
- 2018-20 **Mentor**, WSU Society of Women Engineers Undergraduate Research Outreach

## Technical Skills

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- Programming** Python, Javascript, Typescript, C#, C++, Java,  $\LaTeX$ , SQL
- Biometric Tools** Eye tracking (Tobii, Gazepoint, Eyetribe), fNIRS (BIOPAC Systems, fNIRSOFT)

## References

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- Research** References available upon request
- Teaching** References available upon request