Yang (Ellen) Song

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RESEARCH INTERESTS

My research focuses on natural language processing (NLP), deep learning (DL), machine learning (ML) in software automation to enable computers to intelligently process, understand and generate different software artifacts, e.g. bug reports, source code, to improve the productivity of the development process. Additionally, I develop and study interactive AI systems that enhance user capability in effectively completing complex tasks, notably by utilizing large language models and multimodal models.

EDUCATION

Ph.D. in Computer Science *August 2018 - Present*
Department of Computer Science, College of William & Mary, Williamsburg, VA
Advisor: Dr. Oscar Chaparro

B.S. in Mathematics *August 2012 - June 2016*
School of Mathematics, Sichuan University, Chengdu, China

PUBLICATIONS

Y. Song, A, Saha, Y. Zhou, J. Mahmud, K. Moran, O.Chaparro "On the Automated Mapping of Bug Descriptions to Mobile App UI Screens" - Under Review

Y. Song, J. Mahmud, N. De Silva, Y. Zhou, O.Chaparro, K. Moran, A. Marcus, D. Poshyvanyk, "BURT: A Chatbot for Interactive Bug Reporting" Proceedings of the 45th IEEE/ACM International Conference on Software Engineering (ICSE'23) - Tool demo

Y. Song, J. Mahmud, Y. Zhou, O.Chaparro, K. Moran, A. Marcus, D. Poshyvanyk, "Toward Interactive Bug Reporting for Android App End-Users" Proceedings of the 30th ACM Joint Meeting on the Foundations of Software Engineering (ESEC/FSE'22) - Research track

Y. Song, O. Chaparro, "Bee: A Tool for Structuring and Analyzing Bug Reports" Proceedings of the 28th ACM Joint Meeting on the Foundations of Software Engineering (ESEC/FSE'20) - Tool demo

Y. Song, O.Chaparro "Recommending Bug Assignment Approaches For Individual Bug Reports: An Empirical Investigation" - on arXiv

PROFESSIONAL EXPERIENCE

Research Assistant *March 2020 - Present*
Department of Computer Science, College of William & Mary, Williamsburg, VA

- *Multimodal Representation Learning for GUI and Bug Report Elements.*

  Develop a Transformer-based architecture for modeling graphical user interfaces (UI widgets) and bug report elements (Observed behavior descriptions) to learn visual and text multimodal representations for two tasks: screen and UI widget retrieval.

- *Enabling Interactive Bug Reporting for Android App End-users.*

  Implemented a task-oriented conversational agent that guides end-users to report essential bug report elements, assesses the quality of bug reports and provides feedback by using natural language processing and dynamic program analysis.

- *Analyzing and Structuring Bug Reports.*

  Developed a tool based on machine learning to automatically identify different types of information in textual bug reports and alert reporters about missing information.

- *Improving Automated Bug Report Assignment.*

  Use machine learning and bug report information to recommend the best-performing method for assigning expert developers to individual bug reports.

Teaching Assistant *August 2018 - May 2020*
Department of Computer Science, College of William & Mary, Williamsburg, VA

Courses: Discrete Structures, Finite Automata and Theory of Computation

Software Engineer Intern *April 2017 - August 2017*
Health Big Data Lab, Haola Technology, Beijing, China

Designed and implemented a K-modes clustering algorithm to predict teenager height based on millions of records. Used statistical models and tools to analyze the factors that influence teenager height. Integrated and deployed the clustering algorithm into Android application.

SERVICE

Student volunteer at ICSE'20, ICSME'20, ICSME'23

Web Chair at NLBSE'22 (1st International Workshop on Natural Language-based Software Engineering)

Paper co-reviewer at ASE'21, ICSME'21, ICSME'22, ICSE'22, FSE'23, ICSE'23

AWARDS

W&M International Student Opportunity Scholarship'22

Student Travel Grant for ICSE'22, FSE'22

TECHNICAL SKILLS

Development: Python, Java, JavaScript, Linux, Git, Matlab, R, React, HTML

NLP/ML/DL Experience: Tensorflow, Pytorch, SKlearn, Standford CoreNLP, Spacy

REFERENCE

Oscar Chaparro, Assistant Professor, William & Mary. oscarch@wm.edu
Kevin Moran, Assistant Professor, George Mason University. kpmoran@gmu.edu
Denys Poshyvanyk, Professor, William & Mary. denys@cs.wm.edu
Andrian Marcus, Professor, The University of Texas at Dallas. amarcus@utdallas.edu