Sara Moshtari, PhD Student

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Software Engineer | Software Security and Data Scientist

- ***Creative and highly motivated*** professional, backed by robust experience in software engineering and data analysis.
- ***Strong ability* to implement** machine learning models to solve problems in different domains.
- **Experts in software security analysis** by developing and using software analysis tools and leveraging software vulnerability repositories (ex. Common Weakness Enumeration (CWE) and Common Vulnerabilities and Exposure (CVE))
- ***Excels in independent and collaborative cross-functional team environments*** with wide-ranging expertise covering software development, software security and quality research and data analysis research.
- ***Adept at partnering with industrial teams,*** to design and develop data-driven models to solve domain-specific problems and to do software security analysis.
- ***Proficient in software development*** by leveraging experience with database design, software design and software development with different programming languages.
- ***Excellent written and verbal communications skills;*** demonstrated in numerous publications. ***Multilingual fluency in English and Farsi***

EDUCATION & PROFESSIONAL DEVELOPMENT

- **Doctor of Philosophy (PhD.) Student *in Computing and Information Science***
- Rochester Institute of Technology, Rochester, NY, GPA:4.00 – (Aug. 2019- expected: May 2023)
- Advisor: Dr. Mehdi Mirakhorli
- Coursework: Research Foundations, Quantitative Foundations, Deep Learning, Cyberinfrastructure Foundation, Visual Analytics, Teaching Skills Workshop
- Thesis: Attack Surface Analysis and Software Vulnerability Detection

- ***M.Eng. in Computer Engineering***
- Shiraz University, Shiraz, Iran – GPA 17.71(out of 20) (Sep. 2010- Feb. 2013)
- Coursework: Data Mining, Advanced Computer Architecture, Advanced Database, Formal Software Specification and Verification, Advanced Software Engineering, Advanced Algorithms Design, Evolutionary Computation, M.Sc Seminar
- Advisor: Dr. Ashkan Sami
- Thesis: SCADA Systems' Software Security

- **B. Eng. *in Computer Engineering***
- Azad University of Shiraz, Shiraz, Iran – GPA 16.38(out of 20) (2003-2007)

PUBLICATIONS & PRESENTATIONS

Journal Articles

1. Khalili, A., Sami, A., Azimi, M., **Moshtari**, **S.**, Salehi, Z., Ghiasi, M. and Safavi, A.A., 2016. Employing secure coding practices into industrial applications: a case study. *Empirical Software Engineering*, *21*(1), pp.4-16. https://doi.org/10.1007/s10664-014-9341-9.
2. **Moshtari**, **S.**, Sami, A. and Azimi, M., 2013. Using complexity metrics to improve software security. *Computer Fraud & Security*, *2013*(5), pp.8-17.https://doi.org/10.1016/S1361-3723(13)70045-9.

Conference Papers

1. **Moshtari**, **S.**, Santos, J.C., Mirakhorli, M. and Okutan, A., 2020, September. Looking for Software Defects? First Find the Nonconformists. In *2020 IEEE 20th International Working Conference on Source Code Analysis and Manipulation (SCAM)* (pp. 75-86). IEEE. DOI:10.1109/SCAM51674.2020.00014.
2. **Moshtari**, **S.** and Sami, A., 2016, April. Evaluating and comparing complexity, coupling and a new proposed set of coupling metrics in cross-project vulnerability prediction. In *Proceedings of the 31st Annual ACM Symposium on Applied Computing* (pp. 1415-1421). https://doi.org/10.1145/2851613.2851777

3. **Moshtari**, **S.**, Sami, A. and Azimi, M., 2013. Using complexity metrics for within-project and cross-project software vulnerability prediction. Kaspersky Academy, Asia-Pacifc MEA Round 2013.

Short Conference Papers & Workshop Papers

1. Bojanova, I., Galhardo C.E.C. , **Moshtari, S.**, 2021, Oct. Input/Output Check Bugs Taxonomy – Injection in Spotlight. The 5th International Workshop on Software Faults & The 3rd Annual International Workshop on Software Hardware Interaction Faults.
2. Santos, C.J., **Moshtari**, **S.** and Mirakhorli, M., 2020, March. An Automated Approach to Recover the Use-case View of an Architecture. In *2020 IEEE International Conference on Software Architecture Companion (ICSA-C)* (pp. 63-66). IEEE. DOI: 10.1109/ICSA-C50368.2020.00020.
3. Khalili, A., Sami, A., Ghiasi, M., **Moshtari**, **S.**, Salehi, Z. and Azimi, M., 2014, May. Software engineering issues regarding securing ICS: an industrial case study. In *Proceedings of the 1st International Workshop on Modern Software Engineering* Methods *for Industrial Automation* (pp. 1-6). https://doi.org/10.1145/2593783.2593789.

PROFESSIONAL EXPERIENCE

Teaching Experiences:

INSTRUCTOR| University of Applied Sciences, Shiraz, Iran | 09/2013 to 07/2018

- Designed the course materials (syllabus, lecture notes, weekly assignments, and projects), graded assignments, and projects and taught computer science courses such as Data Structure, Object Oriented Programming, Introductory Programming, Software Engineering, Web Designing, Web Programming, Algorithm Design, Operating System, and Computer Workshop to undergrad. students.
- Lectured classes of approximately 12 to 50 students in different semesters. (Total Duration: 18 to 36 hours per week)

TEACHING ASSISTANT| Shiraz University, Shiraz, Iran | Fall 2013

- Course: Software Engineering
- Graded assignments, projects, and final exam. Answered questions and provided assistance for undergrad. students during problem solving sessions.

Research Experiences:

RESEARCH COLLABORATOR| National Institute of Standard and Technology (NIST), Gaithersburg, MD| 04/2020 to Present.

- Collaborating with NIST in The Bug Framework project by reviewing software weaknesses in public repositories such as CVE and CVE and defining properties of a new Input/Output bug class to make bugs descriptive for developers. (https://samate.nist.gov/BF/Team/index.html)
- Gained proficiency in wide range of software weaknesses, Input/Output check bugs and injection vulnerabilities.
- Collaborating in writing a research paper.
- Achieved publication in a paper.

RESEARCH ASSISTANT | Department of Computing and Information Sciences, Rochester Institute of Technology, Rochester, NY | 08/2019 to Present.

- Supported research, and development of software analysis tools.
- Gained proficiency in wide range of software analysis, software quality assurance and software security improvement and software vulnerability analysis. Using static analysis, data-driven analysis, software code metrics, machine learning techniques, supervised machine learning algorithms, unsupervised machine learning algorithms, deep learning models, attack surface analysis, text mining, NLP algorithms to improve software quality and software development process.
- Achieved publication in some papers.

RESEARCH ASSISTANT | Shiraz University and Shiraz Electricity Distribution Company (ShED Co.), Shiraz, Iran | 02/2019 to 08/2019

- Operated as a researcher in a project titled “Proposed roadmap to address challenges of Shiraz Electricity Distribution Company based on data mining”.
- Assisted in arranging and meeting managers of different departments of ShED Co. to understand existing challenges and problems in the company departments.

- Achieved propose of a roadmap of how to use data mining algorithms to solve the challenges in different departments of ShED Co.

RESEARCH ASSISTANT | Shiraz University and Shiraz Electricity Distribution Company (ShED Co.), Shiraz, Iran | 04/2015 to 09/2017

- Operated as a researcher in a project titled "Use of Information Technology to Detect Tampered Electricity Meters".
- Supported research and software development for detecting electricity theft.
- Assisted in data cleaning and provided dataset required for electricity theft detection.
- Assisted in developing a software application to read essential data from ShED Co. oracle dataset and updating detection dataset.
- Achieved propose of a machine learning technique based on outlier detection to detect tampered electricity meters and development of a software system based on the proposed algorithm that can be used by the company to detect tampered electricity meters.

RESEARCH ASSISTANT | Shiraz University, Shiraz, Iran | 05/2011 to 02/2013

- Operated as a researcher in a project titled "Securing SCADA Systems".
- Supported research and software security improvement for SCADA systems.
- Assisted in proposing a new software vulnerability priority based on industrial system objectives
- Assisted in securing a real word SCADA application named *OpenSCADA* by leveraging security practices provided in public vulnerability repositories such as CWE.
- Achieved publication of some research papers and development of a secured version of the *OpenSCADA* software.

Software Development Experiences:

PROJECT LEAD AND SOFTWARE DEVELOPER | MEDIS Company, Shiraz, Iran | 05/2018 to 08/2019

- Operated as project lead and software developer in multiple projects.
- Assisted in design of software systems using UML models and provided design documents.
- Assisted programming with ASP.NET and C# and implementing REST API (Model and Controller layers of MVC model).
- Assisted in maintenance of previously developed software applications which were written with PHP in LARAVEL framework.
- Achieved development of software applications based on MVC model.

SOFTWARE DEVELOPER | IRIK Company, Shiraz, Iran | 05/2016 to 09/2016

- Gained familiarity with Bash scripting and Programming with Go lang.

CORE PROFICIENCIES

- Problem Solving
- Machine Learning
- Applied Data Mining
- Data Cleaning
- Supervised models
- Unsupervised models
- Outlier Detection
- Deep Learning
- Natural Language Processing (NLP)
- Graph Analysis
- Software Security
- Vulnerability Detection
- Defect Prediction
- Program Analysis
- Data-Driven Software Analysis
- Empirical Software Engineering
- UML
- Software Design
- Software Development
- Programming
- Database Design
- MVC
- Object Oriented Programming

TECHNICAL PROFICIENCY

Python, TensorFlow, Java, C++, C#, Php, ASP.NET, MVC, HTML and CSS, SQL Server, Neo4j, Lucene Queries, Bash Scripting, WEKA, ELKI Data Mining