AHMED TAMRAWI

*PhD in **software security, analysis**, and **engineering**. Love to Learn and Teach, Passionate Team Leader, cybersecurity enthusiastic, and a full-stack developer.*

GET IN TOUCH WITH ME

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+ EMPLOYMENT

EnSoft Corp. Research & Development Engineer (USA)

AUG '16 – PRESENT

- Leading the development of **Atlas Binary**, a novel binary analysis framework to support binary rewriting and security vulnerabilities patching.
- Being part of the development of **Atlas**, a novel program analysis, comprehension, and verification platform for multiple languages.
- Improving C support for **Atlas** platform by extending the analysis algorithms to improve handling of various C syntax that is adopted by major automotive clients.
- Enhancing the efficiency of handling recent Linux kernel releases in **Atlas** by optimizing the analysis algorithms and internal graph database data structures.
- Being part of the development of **Modelify**, a platform for converting C code to Matlab Simulink models.
- Improving the accuracy and efficiency of the C-to-Simulink conversion algorithm in **Modelify** to improve support for major company's clients by performing frequent code refactoring and enhancing the readability of the code-base.
- Working with customers' engineers to resolve their technical issues, provide needed training, and elicit further enhancements.
- Working on fixing customers' bugs, implementing required features and enhancements, and their successful delivery.

Birzeit University Assistant Professor (Palestine)

Fall '18, '19, '20

- Teaching a master-level course on Software Construction at the Computer Science department. The primary goal of this course is to teach students how to create high-quality software that is robust, flexible, extensible, scalable, and maintainable.
- Developed visually appealing new material and presentations and engaged students in a fun and motivating class environment.
- Developed engaging assessments (assignments and exams) which consist of two types of questions: (1) *synthesis* questions require students to analyze a program with respect to the software construction concepts and practices studied in class, and (2) *conceptual* questions reinforce important concepts and may only be practically achievable with a working software implementation.
- Developed a course project that is based on *open-source excursion* where the students are asked to contribute to widely adopted and actively contributed open-source projects. Many students' pull requests were successfully merged in.
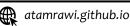- Being a member of couple of thesis defense and proposal committees.

Yarmouk University Assistant Professor (Jordan)

Fall '17, Spring '17, Summer '17

- Taught multiple undergraduate-level courses: Numerical Analysis for Engineers, Introduction to Programming and Operating Systems Concepts courses.
- Developed visually appealing new material and presentations and engaged students in a fun and motivating class environment.
- Developed practical lab materials for Introduction to Programming and Operating Systems Concepts courses. Lab tasks are decomposed into synthesis and conceptual experiments to motivate students to understand the theoretical concepts and boost their technical skills and knowledge of development tools and technical practices.
- Defined major milestones for courses and held one-on-one meetings with students at each milestone to gauge students' performance and resolve any misunderstandings and academic problems.
- Being a member of couple of the testing committees for senior design projects and internships.

Amazon Software Development and Engineer Intern (USA)

May '16 – AUG '16

- Lead the development of **Amazon Warehouse Shipment Forecast Accuracy** webservice. The webservice computes the accuracy of warehouse shipment forecast by comparing the forecast data with the actual warehouse shipment data for billions of shipments. The goal is to be able to predict future shipments with higher accuracy to set future goals, milestones, and plans.
- Developed accuracy assessment dashboard to assist decision makers and research scientists to explore the shipment data visually.
- Defined webservice specification and requirements, designed the corresponding architecture, and chose the suitable technology stack.
- Designed and implemented proper classes and database tables for accuracy results storage and defined proper accuracy metrics.
- Designed and implemented a testing strategy including unit test cases, integration test cases and systems test cases with tranch and statement coverage of at least 95% for all modules.
- Performed alpha and beta testing with simulated data with at least 10M shipment data and delivered a production release to run with billions of shipment data.

+ TECHNICAL SKILLS

	Average	Good	Skilled
Java, C, C#			▮
Full Stack Development		▮	
Software Configuration Management		▮	
Software Build & Testing			▮
Software Security			▮
Software Analysis & Auditing			▮
Webservice & Microservice Development		▮	
Continuous Development & Integration		▮	

+ PROFESSIONAL SKILLS

	Average	Good	Skilled
Research & Analytics			▮
Written & Verbal Communication			▮
Presentation Skills			▮
Project Management		▮	
Leadership			▮
Learning Curve			▮
Object-Oriented Design			▮
Agile Development		▮	
Algorithm Design			▮

+ PROFESSIONAL HIGHLIGHTS

- **+** Extensive experience in software analysis to detect novel and sophisticated algorithmic complexity and side channel attacks in Java applications and malware in Android Apps.
- **+** Experience in working on two high profile DARPA programs: APAC and STAC programs. Served on the Iowa State University team as an analyst for **DARPA's Automated Program Analysis for Cybersecurity (APAC)** program ($4,648,672). Currently, serving on the EnSoft team on **DARPA's Space/Time Analysis for Cybersecurity (STAC)** program ($4,137,198).
- **+** Experience in teaching software security, software analysis, compilers, and software construction related courses, operating system concepts course, and introduction to programming courses. [*See: atamrawi.github.io/teaching*]
- **+** Experience in technical research, writing, documentation, and presentation.
- **+** Proven ability to collaborate across different departments and teams to release products.
- **+** Passion for keeping up with emerging technologies and the latest breakthroughs.
- **+** Good experience in object-oriented design, algorithm design, and project planning and design.
- **+** Published +20 research papers, technical reports, and book chapters in top-tier peer-reviewed journals and conferences. [*See: atamrawi.github.io/publications*]

╋ EMPLOYMENT

G.ho.st **Research and Development Engineer** (Palestine)

- o Being a part of the development of a Global web Hosted Operating System (G.ho.st) which provides users with daily-life essential applications and widgets on the web.
- o Integrated multiple webservices into the system and developed widgets and complete GUI to show status updates and notifications from services such as: Facebook, Twitter, and IM services, and Google Docs.
- o Working on fixing customers' bugs, implementing required features and enhancements, and their successful delivery.

MBRM **Software Development Engineer** (Jordan)

- o Developed web and windows applications to satisfy customers' needs, using ASP.NET, C#, Visual Basic, and C++.
- o Developed the company's Content Management System (CMS) for creating, managing, and editing their customers' websites.
- o Designed and implemented a web news aggregator engine that takes in a list of news website URLs from a database and then automatically crawls those websites regularly, presenting a summary of all the articles found across the news websites on a single site for quick reference.

╋ EDUCATION

PhD in Computer Engineering Iowa State University

- o **Experienced in** *Software Security*, *Software Analysis and Verification*, and *Software Engineering*.
- o **Supervisor:** Suraj C. Kothari in /surajkothari
- o **Thesis:** "*Evidence-Enabled Verification for the Linux Kernel*"
- o Served as a researcher and analyst for **DARPA Space/Time Analysis for Cybersecurity (STAC)** and **Automated Program Analysis for Cybersecurity (APAC)** programs.
- o Technical research, writing, documentation, and presentations in software analysis to **detect novel and sophisticated algorithmic complexity and side channel security attacks and vulnerabilities in java applications and malware in android apps**.
- o Technical research, writing, documentation, and the development of a novel compact software graph called the projected control graph and the design of the L-SAP tool for fast, scalable, and efficient evidence-enabled verification for the Linux kernel. **L-SAP led to the discovery of +80 verified Linux kernel bugs**.

MSc in Computer Engineering Iowa State University (Fulbright Awardee)

- o **Experienced in** *Software Engineering and Maintenance, Data Mining, Applications of Machine Learning.*
- o **Supervisor:** Tien N. Nguyen in /tien-nguyen-3118353
- o **Thesis:** "*Fuzzy set and cache-based approach for bug triaging*"
- o Technical research, writing, documentation, and the development of **Bugzie**, a tool that applies a novel bug triaging technique based on mined developer's experience based on their fixing history of bug reports.
- o Technical research, writing, documentation, and the development of **SyMake** tool to enable program analysis and bug discovery in build files.

╋ Publications [More on: *atamrawi.github.io/publications*]

- o Yazan Al-Issa, Mohammad Ashraf Ottom, Ahmed Tamrawi. **eHealth Cloud Security Challenges: A Survey.** *Journal of Healthcare Engineering,* January 2019.
- o Ahmed Tamrawi, Sharwan Ram, Payas Awadhutkar, Benjamin Holland, Ganesh Ram Santhanam, Suresh Kothari. **DynaDoc: Automated On-Demand Context-Specific Documentation.** *Third International Workshop on Dynamic Software Documentation*, Spain, September 2018.
- o Ahmed Tamrawi, Suresh Kothari. **Projected Control Graph for Computing Relevant Program Behaviors.** *Science of Computer Programming Journal*, Elsevier, October 2018.
- o Benjamin Holland, Payas Awadhutkar, Suresh Kothari, Ahmed Tamrawi and Jon Mathews. **COMB: Computing Relevant Program Behaviors.** *The 40th International Conference on Software Engineering*, Gothenburg, Sweden, May 2018.
- o Suresh Kothari, Ganesh Santhanam, Benjamin Holland, Payas Awadhutkar, and Jon Mathews, Ahmed Tamrawi. **Catastrophic Cyber-Physical Malware.** *Springer Verlag Publishers*, April 2018.
- o Ganesh Ram Santhanam, Benjamin Holland, Suresh Kothari, Nikhil Ranade. **Modeling Lessons from Verifying Large Software Systems for Safety and Security.** *The 2017 Winter Simulation Conference (WSC 2017),* Las Vegas, Nevada, December 2017.
- o Ahmed Tamrawi, Suresh Kothari. **Projected Control Graph for Accurate and Efficient Analysis of Safety and Security Vulnerabilities.** *The 23rd Asia-Pacific Software Engineering Conference (APSEC 2016),* Hamilton, New Zealand, December 2016.
- o Suresh Kothari, Payas Awadhutkar, Ahmed Tamrawi. **Insights for Practicing Engineers from a Formal Verification Study of the Linux Kernel.** *The 2016 IEEE International Symposium on Software Reliability Engineering Workshops*, Ottawa, Canada, October 2016.
- o Ahmed Tamrawi. **Evidence-Enabled Verification for the Linux Kernel.** *Iowa State University*, Ames, Iowa, August 2016.
- o Suresh Kothari, Ahmed Tamrawi, Jon Mathews. **Human-machine resolution of Invisible Control Flow?** *The IEEE 24th International Conference on ICPC 2016*, Austin, Texas, May 2016.
- o Suraj Kothari, Ahmed Tamrawi, Jeremias Sauceda, Jon Mathews. **Let's Verify Linux: Accelerated Learning of Analytical Reasoning through Automation and Collaboration.** *The 2016 IEEE/ACM International Conference on Software Engineering Companion*, Texas, May 2016.
- o Suraj Kothari, Ahmed Tamrawi, Jon Mathews. **Rethinking Verification: Accuracy, Efficiency, and Scalability through Human-Machine Collaboration.** *The 2016 IEEE/ACM International Conference on Software Engineering Companion*, Austin, Texas, May 2016.
- o Suresh Kothari, Akshay Deepak, Ahmed Tamrawi, Benjamin Holland, Sandeep Krishnan. **A "Human-in-the-loop" Approach for Resolving Complex Software Anomalies.** *The 2014 IEEE International Conference on Systems, Man, and Cybernetics,* California, October 2014.
- o Ahmed Tamrawi, Hoan Anh Nguyen, Hung Viet Nguyen, Tien N Nguyen. **SYMake: A Build Code Analysis and Refactoring Tool for Makefiles.** *The 27th IEEE/ACM International Conference on Automated Software Engineering ASE 2012*, Essen, Germany, September 2012.
- o Ahmed Tamrawi, Hoan Anh Nguyen, Hung Viet Nguyen, Tien N Nguyen. **Build Code Analysis with Symbolic Evaluation.** *The 34th International Conference on Software Engineering ICSE 2012*, Zurich, Switzerland, June 2012.
- o Anh Tuan Nguyen, Tung Thanh Nguyen, Hoan Anh Nguyen, Ahmed Tamrawi, Hung Viet Nguyen, Jafar Al-Kofahi, Tien N Nguyen. **Graph-Based Pattern-Oriented, Context-Sensitive Source Code Completion.** *The 34th International Conference on Software Engineering,* Switzerland, 2012.
- o Ahmed Tamrawi, Tung Thanh Nguyen, Jafar Al-Kofahi, Tien N Nguyen. **Fuzzy Set and Cache-Based Approach for Bug Triaging.** *The 19th ACM SIGSOFT symposium and the 13th European conference on Foundations of software engineering ESEC/FSE 2011*,Hungary, September 2011.
- o Ahmed Tamrawi, Tung Thanh Nguyen, Jafar Al-Kofahi, Tien N Nguyen. **Fuzzy Set-Based Automatic Bug Triaging (NIER Track).** *The 33rd International Conference on Software Engineering ICSE 2010*, Cape Town, South Africa, May 2010.
- o Jafar M Al-Kofahi, Ahmed Tamrawi, Tung Thanh Nguyen, Hoan Anh Nguyen, Tien N Nguyen. **Fuzzy Set Approach for Automatic Tagging in Evolving Software.** *The 2010 IEEE International Conference on Software Maintenance ICSM 2010*, Timișoara, Romania, September 2010.