

# Ehsan Edalat

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Formal Security Lab., Computer Eng. and IT Dept., Amirkabir Univ. of Tech. (AUT), 424 Hafez Ave., Tehran, Iran

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## RESEARCH INTERESTS

- Privacy (including differential privacy and former privacy models, private mechanism design, and private database release)
- Software Testing-White Box Testing (Symbolic & Concolic Approaches)
- Software Vulnerability Analysis and Detection
- Language-Based Security
- Formal Methods in Information Security

## EDUCATION

- Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran  
PhD. Candidate, Computer Engineering, Software  
September 2018-Now  
GPA: 17.86/20
- Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran  
M.Sc., Information Technology, Information Security  
September 2015 - January 2018  
GPA: 17.31 / 20
- Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran  
B.Sc., Computer Engineering, Software  
September 2011 - September 2015  
GPA: 17.36 / 20
- Imam Khomeini High School, Estahban, Fars, Iran  
Diploma in Mathematics and Physics  
September 2007 - June 2011  
GPA: High School 19.18 / 20, Pre-University 18.5/ 20

## HONORS AND AWARDS

- Offered for **Direct Admission** to graduate school (**Ph.D.**) in Computer Engineering - Software, from two top universities of Iran, University of Tehran and Amirkabir University of Technology, without taking the Nationwide University Entrance Exam for Ph.D. as a reward of academic records and achievements, Tehran, Iran, 2018.
- Awarded as the **Outstanding Student** and achieved *2<sup>st</sup>* place among 2015-beginner graduate students in Information Security major, AUT, 2016 and 2017.
- Admitted to **Tarbiat-Modares University** and Achieved *49<sup>rd</sup>* place among all applicants of the Nationwide University Entrance Exam for M.Sc. in Information Technology (Approximately 30000 applicants), Iran, 2015.
- Member of **Formal Security Lab.**, Computer Engineering, Amirkabir University of Technology, Tehran, Iran, September 2018 - now.
- Member of **Data Security Lab.**, Computer Engineering, Amirkabir University of Technology, Tehran, Iran, March 2015 - September 2018.
- Qualified to **Direct Admission** to graduate school (**M.Sc.**) of Computer Engineering , AUT, 2014.
- Achieved **18<sup>th</sup>** place among about 100 undergraduate students (8<sup>th</sup> place in Software Eng. Major) in Computer Engineering, Amirkabir University of Technology, Tehran, Iran, 2013.
- Achieved top **2%** place among all applicants for the University Entrance Nationwide Exam (Approximately 260000 applicants) in Math. and Eng., Iran, 2011.
- Achieved top **1.5%** place among all applicants of the Nationwide University Entrance Exam for B.Sc. in Foreign Languages - English (Approximately 108000

applicants), Iran, 2011.

## RESEARCH EXPERIENCES

September 2018-Now  
Formal Security Lab

### **Private Web Searching-** Ph.D. Thesis, (September 2018-Now)

We are working on a privacy model for preserving the privacy of users in the web world. Nowadays, search engines are a vital part of every person's life. Users send various queries to find the answers to multiple questions. But besides the solutions, search engines learn the preferences of users in each topic, which users find inconvenient in it. In our research, we are going to design a privacy model, which guarantees the users that search engines will not learn about sensitive topics. From now on, we focus on differential privacy as our fundamental privacy model.

November 2015 – January 2018  
Data Security Lab

### **Concolic Execution for Detecting Injection Vulnerabilities in Mobile**

#### **Apps -** M.Sc. Thesis, (November 2015 – January 2018)

We present a method for detecting injection vulnerabilities in Android Apps with Concolic Execution and taint analysis. With static analysis, we extract desirable paths for detection analysis. With the idea of using Mock classes, we alleviate event-driven and path explosion challenges due to the Android framework. For the evaluation of our tool, we use ten self-designed and 140 F-Droid repository Apps. The overall result shows that 11 Apps are vulnerable to SQL injection.

### **Design and Implementation of Extensible Software in order to**

#### **Retrieve Deleted Information from Smart Phones -** B.Sc. Project, (March 2015 - September 2015)

In this work, we implement a tool for mobile forensics. With this tool, deleted information on sensitive mobile apps like SMS, Emails, Browser bookmarks, histories, etc. are retrieved. Also, our software supports deleted photos and files on internal storage. The primary approach of this work is three different methods of extracting deleted records from SQLite.

## PUBLICATIONS AND TECHNICAL REPORTS

- **E. Edalat, B. Sadeghiyan, F. Gassei** “*ConsiDroid: A concolic-based tool for detecting SQL injection vulnerability in Android apps*”, arXiv preprint arXiv:1811.10448, 2018.
- **E. Edalat, M. Aghvamipناه, B. Sadeghiyan** “*Guided Concolic Execution of Android Apps for Automatic Generation of Test Inputs*”, ICEE, 2018. (In Persian)
- **E. Edalat, B. Sadeghiyan** “*Concolic Execution for Detecting SQL Injection Vulnerability in Android Apps*”, CSICC, 2018. (In Persian)
- **E. Edalat**, “*Discovering Software Vulnerabilities by Concolic Execution*” - report for Seminar course, AUT, 2016. (In Persian)
- **E. Edalat, S.M.M. Ahmadpanah**, “*Formal Analysis of Kerberos v5*” – project report for Security Protocols course, AUT, 2016. (In Persian)
- **E. Edalat**, “*Design and Implementation of Extensible Software in order to Retrieve Deleted Information from Smart Phones*” - B.Sc. Thesis, AUT, 2015. (In Persian)
- **Lecturer**, Advanced Programming Course (Spring 2020)
- **Lecturer**, Advanced Programming Course (Fall 2019)
- **Instructor**, Advanced Programming Lab (Spring 2018)  
*Under supervision of Dr. NoorHosseini, Dr. Nickabadi.*
- **Instructor & Coordinator**, Computer Lab (Fall 2017)  
*Under supervision of Dr. Bakhshi, Dr. Nickabadi, Dr. Nazerfard, Dr. Shiri, Dr. Sabaei.*
- **Instructor**, Computer Lab (Fall 2016)  
*Under supervision of Dr. Nickabadi.*
- **Teaching Assistant**, Design and Principles of Databases (Fall 2015, 2016, Spring 2016)

## TEACHING EXPERIENCES

	<p><i>Under supervision of Dr.AmirHaeiri and Dr. Momtazi.</i></p> <ul style="list-style-type: none"> <li>• <b>Teaching Assistant</b>, Computer Networks I (<i>Spring 2017</i>) <i>Under supervision of Dr.Sadeghiyan.</i></li> <li>• <b>Teaching Assistant</b>, Design and Principles of Compilers (<i>Spring 2015</i>) <i>Under supervision of Dr.Razazi.</i></li> <li>• <b>Teaching Assistant</b>, Computer Networks II (<i>Spring 2015</i>) <i>Under supervision of Dr.Sabaei.</i></li> <li>• <b>Teaching Assistant</b>, Internet Engineering (<i>Fall 2014</i>) <i>Under supervision of Dr.Bakhshi.</i></li> <li>• <b>Teaching Assistant</b>, Advanced Programming (<i>Spring 2014</i>) <i>Under supervision of Prof. Pourvatan.</i></li> <li>• <b>Teaching Assistant</b>, Data Structures (<i>Fall 2013</i>) <i>Under supervision of Dr.Dehghan.</i></li> </ul>
TALKS	<ul style="list-style-type: none"> <li>• Presenting “<b>How to Read a Paper?</b>” in GradTalks, Computer Engineering, Amirkabir University of Technology, June 2020.</li> <li>• Workshop Instructor of <b>AUT Linux Festival (Penetration testing with Kali Linux)</b>, Computer Engineering, Amirkabir University of Technology, Feb 2020.</li> <li>• Presenting “<b>Arms Race in Cyber Security: Vulnerabilities in Operating Systems</b>” AUT CERT Talks (In Persian), Computer Engineering, AUT, May 2019.</li> <li>• Presenting “<b>Arms Race in Cyber Security: Social Engineering and Steal Information</b>” AUT CERT Talks (In Persian), Computer Engineering, AUT, June 2019.</li> <li>• Founder and Coordinator of <b>Information Security Talks</b>, Computer Engineering, Amirkabir University of Technology, Feb. 2019.</li> <li>• Presenting “<b>Concolic Execution</b>” - GradTalk (In Persian), Computer Engineering, AUT, 2017.</li> <li>• Presenting “<b>Dynamic Information Flow Analysis</b>” - Oral presentation for seminar of Formal Models and Information Security course (In Persian), AUT, 2017.</li> <li>• Presenting “<b>Discovering Software Vulnerabilities by Concolic Execution</b>” - Oral presentation for Seminar course (In Persian), AUT, 2016.</li> </ul>
WORK EXPERIENCES	<ul style="list-style-type: none"> <li>• <b>Mahsan</b>, (<i>August 2020-now</i>) <i>SecurityEngineer and Consultant</i></li> <li>• <b>Kolah Sefid (Bug Bounty Platform)</b>, (<i>January 2018 - October 2019</i>) <i>Cheif Technical Officer (CTO), Technical Referee (Web Application Security) and Consultant</i></li> <li>• <b>Kahkeshan Moshaver</b>, (<i>June 2018 - July 2019</i>) <i>Security Consultant and Provider of Security Protection Profiles</i></li> <li>• <b>Amirkabir University of Tech. CERT Lab. (A.P.A.)</b>, (<i>May 2014 - October 2019</i>) <i>Web Application Security Penetration Tester, Forensics, Software Developer and Instructor</i></li> <li>• <b>Idea Pardazan (6thsolution)</b>, (<i>Summer 2015</i>) <i>Android Developer.</i></li> <li>• <b>Rayan Pardazan Nikro Emertat (RAPNA)</b>, (<i>Summer 2014</i>) <i>Software Engineer and Web Developer (PHP server-side for an Android application) - Summer Internship.</i></li> </ul>
TOP ACADEMIC COURSE PROJECTS	<ul style="list-style-type: none"> <li>• <b>Software Systems Security</b>, <i>Threat Modeling and Bug Filing of a File Integrity Checker</i></li> <li>• <b>Network Security</b>, <i>Security Mechanisms and Defense Techniques in different layers of Computer Networks</i></li> <li>• <b>Database Security</b>, <i>Security in Oracle including User Management, Roles, VPD and Auditing</i></li> <li>• <b>Security Protocols</b>, <i>Formal Analysis of Kerberos v5 Protocol with MaudePSL</i></li> <li>• <b>Secure Computer Systems</b>, <i>BufferOverFlow in SELinux and MSSQL Security Survey</i></li> </ul>

## TECHNICAL SKILLS

- **Cryptology,**  
*MARS Cryptosystem: 256-bit Expansion and, SERPENT Cryptosystem Linear and Differential Analysis.*
- **Compiler Design,**  
*Implementing a front-end compiler for a programming language using flex and bison. The project has been done using Java and C in two versions.*
- **Programming Languages,**  
*Developing an interpreter using ML language. The project has been done using lex, yacc, and other abilities of OCaml.*
- **Programming Languages:**  
Java, C#, C/C++, PHP, Mips, ML, OCaml, Shell Scripting, Haskell.
- **Database Systems:**  
MySQL, MongoDB, MSSQL.
- **Operating System:**  
Windows, Linux (Ubuntu, Fedora and Kali).
- **Web Development:**  
HTML (XHTML and HTML 5), CSS, JavaScript, jQuery, PHP, XML, XSLT, J2EE, Yii.
- **Penetration Tools**  
Nessus, MetaSploit, BurpSuit, NetSparker, Accunetix, SQLMap and, ...
- **Other:**  
MS Threat Modeling Tool, PREfast, MaudePSL, SELinux, UML, Flex and Bison, Boson NetSim, Cisco Packet Tracer, MS Project, VHDL, Verilog, Orcad Pspice, Proteus

## LANGUAGES

- **Persian (Farsi):** Mother tongue (Native)
- **English:** Professional working proficiency

## REFERENCES

- **Mehran S. Fallah, Associate Professor**  
Computer Engineering, Amirkabir University of Technology  
Email: [msfallah@aut.ac.ir](mailto:msfallah@aut.ac.ir)
- **Babak Sadeghiyan, Associate Professor**  
Computer Engineering, Amirkabir University of Technology  
Email: [basadegh@aut.ac.ir](mailto:basadegh@aut.ac.ir)
- **MohammadReza Razzazi, Professor**  
Computer Engineering, Amirkabir University of Technology  
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- **Mehdi Dehghan TakhtFooladi, Professor**  
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- **Seyed Majid Noorhosseini, Assistant Professor**  
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- **Masoud Sabaei, Associate Professor**  
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- **Bahador Bakhshi, Assistant Professor**  
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- **Ahmad NickAbadi, Assistant Professor**  
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- **Maryam AmirHaeri, Assistant Professor**  
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- **Saeedeh Momtazi, Assistant Professor**  
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- **Ehsan Nazerfard, Assistant Professor**  
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- **Hossein Zeinali, Assistant Professor**  
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- **Fatemeh Ghassemi Esfahani, Assistant Professor**  
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