

## PERSONAL INFORMATION



# Majid Babaei

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## EDUCATIONS

Jan'2018 – Present

### Ph.D. (student) Software Architecture Modelling

Queen's University, Kingston, Canada

### M.Sc. Automotive Software Engineering

Technische Universität Chemnitz (TUC), Saxony, Germany

**Thesis Title:** *Conception and Implementation a pattern recognition system for analysing big data from distributed embedded AMRA boxes in Europe*

- **Main courses:** Hardware Development with VHDL, Hardware Software Co-design I & II, Design of Software for Embedded Systems, Design of Real-time Systems, Automotive Software Engineering.

Apr'2015 – Nov'2017

### B.Sc. Computer Engineering, specialized in Software

Shahrood University of Technology (ShTU), Shahrood, Semnan, Iran

**Thesis Title:** *Improving the security of computer networks based on DNA computing and chaos theory.*

- **Main courses:** C programming, C++ programming, Computer networks, Compilers, Operating System, Software engineering, Data structure, Algorithm design

Sep'2007 – Jul'2012

## SKILLS

### Programming

**Frontend** JavaScript HTML CSS JSP

**Backend** PHP Java C/C++ Python Scala

**Database** MySQL Mongo Oracle HDFS

**Operating Systems** Windows Ubuntu Centos Debian Mint

### Data Analytics

**Tools** Apache Hadoop Apache Spark R Excel Matlab

### Machine Learning

**Methods** Artificial Neural Network Decision Tree Logistic Regression Support Vector Machines

## WORK EXPERIENCES

### Software Developer (Internship and Master Thesis)



Robert Bosch GmbH, Stuttgart, Germany

Dec'2016 – Nov'2017

- Master Thesis [Topic]: **Conception and Implementation a pattern recognition system for analysing big data from distributed embedded AMRA boxes in Europe**
  - **Core development Platforms:**
    - Distributed analytics environment based on Apache Hadoop and Apache Spark
    - Working with Hadoop Distributed File System (DHFS)
    - Implementing based on Scala and Java programming language
    - Working on Asset Monitoring for Railway Applications solution (AMRA) Project
    - Providing NoSQL DB such as MongoDB to store distributed AMRA datasets
  - **Backend and frontend development:**
    - Implementing based on J2EE (Servlet, JSP, HTML, CSS, JavaScript)
    - Spring MVC development platform
    - Object/Relational Mapping (ORM) such as Hibernate
- Internship: **Working on Logalyzer project in Internet of Things (IoT) department:**
  - Participating in developing a Logalyzer software based on python and using open source libraries to provide Telnet connection with AMRA boxes.
  - Analyzing received messages contain devices status and operating some functions on them.
  - Implementing different workspaces to deal with online and offline message analysis.

### Senior Software Developer (Part Time, three days in a week)



EPAK GmbH, Leipzig, Saxony, Germany

Jun'2015 – Nov'2016

- **C/C++, Qt based programming language (Progsoft):**
  - Designing and developing CLI and GUI mode C++ software based on QT platform which is responsible for providing an environment to have access to different types of VSAT and TV antenna in order to program corresponding microchips (*PIC16F87X CMOS flash microcontroller and PIC18FXX2 enhanced flash microcontroller*) and get the current status of connected devices.
  - Participating in designing and developing new version of Progsoft based on BOOST platform in C++ programming language and using MVC (Model-View-Controller) software architecture.
  - Senior software developer in the following responsibilities:
    - Designing and developing a Yaml file parser.
    - Providing the software environment for communicating between an EBox (an electronic unit which contains some customised microcontrollers) and ACU (an electronic unit which responsible for controlling the given commands and sending them to EBox).
    - Designing and developing a logging solution by using (LOG4CXX) library.
    - Designing and developing multi-layer debugging methodology.
    - Developing an efficient auto-converter file format between the customised Hex format and Yaml format.
- **Python programming language (Antenna-Simulator):**
  - Designing and developing an antenna simulation system based on python programming language in order to provide more reliable communication with antenna in different circumstances.
- **PHP programming language (Webserver):**
  - Participating in developing some functionalities on the VSAT webserver in PHP language programming and using some web-development technologies such as Ajax, JavaScript and HTML.
  - Participating in designing DivKit-TV webserver architecture in PHP language programming.
  - Designing and developing a webserver in PHP, JavaScript and HTML to provide web-communication services among different departments in EPAK GmbH and handing different requests from users in different access levels.

## Project Manager and Software Developer (Full Time)



### Farazpajohan (First intermediate CA in Iran), Tehran, Iran

- **C/C++, Shell script and JavaScript Programming** for designing and developing PKI-based Digital Certificate solutions (Integrated system for issuing and managing Digital Certificate) based on Centos Linux distribution.
  - Project manager, chief software designer. In charge of requirement analysis and refinement. Involved in development, test and debug of most software modules and reviewed all codes that other team members wrote. Also did all presentations and managed all sessions with customers. Some details about the project:
    - The solution depends on the most reliable cryptographic algorithms which are introduced through National Institute of Standards and Technology (NIST) for each specific usage.
    - The server application is modular, each module runs as a standalone daemon and they interconnect via TCP sockets over SSL and act as client/server.
    - The solution depends on the most reliable cryptographic algorithms which are introduced through National Institute of Standards and Technology (NIST) for each specific usage.
    - The server application is modular, each module runs as a standalone daemon and they interconnect via TCP sockets over SSL and act as client/server.
    - Load balancing for received requests in order to verify digital certificate status through Online Certificate Revocation Status Protocol (OCSP) which is implemented as a responder service. In addition to this, Registration Authority (RA), Time Stamp Authority (TSA) and Simple Certificate Enrolment Protocol (SCEP) are working as independent services based on the defined policy in PKI-based solution.
    - The solution is developed in pure C and C++ with minimum dependency to external libraries (except for *OpenSSL*, *OpenLDAP*, *OpenCryptoki*, and *PKCS11-helper*) on CentOS.
- Project management operations performed based on an ERP system. Also, SCRUM methodology used in software development process

Aug'2012 – Feb' 2015

## SELECTED PUBLICATIONS

- **M. Babaei**, M. Nazariyan, R. Jalili, "Application of Duffing and Lazy chaotic maps in improving performance of M-Sequence's random-bit sequences", IEEE International Conference on Information Security and Cryptology (ISCISC), Tehran University, Tehran, Iran, (2014). [In Persian]
- **M. Babaei**, "A Novel Text and Image Encryption Method Based on Chaos Theory and DNA Computing", [Springer] Journal of natural computing (ISI indexed), Vol. 12, Issue 1 , pp. 101-107, (2013). doi:10.1007/s11047-012-9334-9
- **M. Babaei**, "An Efficient Combination of Chaotic Logistic map and DNA Computing for Data Encryption", IEEE International Conference on Information Security and Cryptology (ISCISC), 9th, [as Poster] (2012).
- **M. Babaei**, M. Farhadi, "Introduction to secure PRNGs ", International Journal of Communications Network and System Sciences, Vol. 4, No. 10, pp. 616-621, (2011). doi:10.4236/ijcns.2011.410074
- H. Rahimov, **M. Babaei**, M. Farhadi, "Cryptographic PRNG Based on Combination of LFSR and Chaotic Logistic Map", Journal of Apply Mathematics, Vol. 2, No. 12, pp. 1531-1534, (2011). doi:10.4236/am.2011.212217
- **M. Babaei**, M. Ramyar, "Improved performance of LFSRs system with discrete chaotic iterations", World Applied Science Journal (ISI indexed), Vol. 13, Issue: 7, pp. 1720-1725, (2011). ISSN:1818-4952
- H. Rahimov, **M. Babaei**, H. Hassanabadi, "Improving Middle Square Method RNG using Chaotic Map", Journal of Apply Mathematics, Vol. 2, No. 4, pp. 482-486, (2011). doi:10.4236/am.2011.24062
- H. Rahimov, M. Farhadi, **M. Babaei**, "Chaotic Random Number Generator and Its Evaluation by Genetic Algorithm", International Journal of Soft Computing, Vol. 5, No. 5, PP. 200-205, (2010). doi:10.3923/ijscmp.2010.200.205
- **M. Babaei**, H. Rahimov, M. Farhadi, "A chaotic middle product method for generating random numbers", International Conference on Information Security and Cryptology

(ISCISC), pp. 289-296, K.N.Toosi UT ,Tehran, Iran, (2010). [In Persian]

- **M. Babaei**, H. Rahimov, M. Farhadi, M. R. Jahed Motlagh, "Random Sequence Generator Based on Chaotic LFSR", International Conference on Intelligent Systems and Technologies, Issue: 68, pp. 522-525, Paris, France, (2010).
- **M. Babaei**, H. Rahimov, "Efficient Detecting of RFID Tag Cloning Attacks using Chaos Theory", International Conference on Communications Engineering, pp. 116- 121, Zahedan, Iran, (2010).
- H. Rahimov, **M. Babaei**, M. Farhadi, "RFID applications in lighting control pathways", Conference on Electrical and Computer Experts: Revised strategic for consumption patterns, Shahr-e-kord,Iran, (2010). [In Persian]

#### ACADEMIC AWARDS

Jan' 2018 – Present	<b>PhD. Full Scholarship Award, Canada</b>
Jan' 2018	<b>Queen's Graduate Awards (QGA), Canada</b>
Aug' 2011	<b>Student Research Centre, Shahrood University of Technology, Iran</b> <ul style="list-style-type: none"> <li>▪ Implementing a cryptosystem based on chaos theory</li> </ul>

#### CERTIFICATES

Jul'2010	<b>Student Research Center of ShUT, Shahrood, Semnan, Iran</b> <ul style="list-style-type: none"> <li>▪ <b>The Lead Student Researcher of Faculty</b></li> </ul>
Mar'2011	▪ Certificate of <b>Data Mining training</b> by TÜV Rheinland Group
May'2010	▪ Certificate of <b>Project Management Body of Knowledge (PMBOK)</b>
Jun'2012	<b>Cisco Academy Center [Asre-Shabake], Tehran, Iran</b> <ul style="list-style-type: none"> <li>▪ <b>Certificate of CCNA (Cisco Certified Network Associate)</b> <ul style="list-style-type: none"> <li>▫ Including: Routing, Switching.</li> </ul> </li> </ul>

#### REFERENCES

<b>Queen's University</b>	<ul style="list-style-type: none"> <li>▪ <b>Prof. Dr. Jürgen Dingel</b> (e-mail: <a href="mailto:dingel@cs.queensu.ca">dingel@cs.queensu.ca</a>) <ul style="list-style-type: none"> <li>▫ Professor in School of Computing</li> <li>▫ Address: 723 Goodwin Hall Kingston, Ontario, K7L 2N8, Canada</li> <li>▫ Telephone: +1 (613) 533-3071</li> </ul> </li> </ul>
<b>Bosch Engineering GmbH</b>	<ul style="list-style-type: none"> <li>▪ <b>Dr. Stefan Müller</b> (e-mail: <a href="mailto:Stefan.Mueller2@de.bosch.com">Stefan.Mueller2@de.bosch.com</a>) <ul style="list-style-type: none"> <li>▫ CTO at IoT department</li> <li>▫ Address: Robert-Bosch-Allee 1, 74232 Abstatt</li> <li>▫ Telephone: +49 (0) 07062 91102</li> </ul> </li> </ul>
<b>EPAK GmbH</b>	<ul style="list-style-type: none"> <li>▪ <b>Jochen Grüner</b> (e-mail: <a href="mailto:jgruener@epak.de">jgruener@epak.de</a>) <ul style="list-style-type: none"> <li>▫ CEO at EPAK GmbH</li> <li>▫ Address: Spinnereistraße 7 / Halle 6, 04179 Leipzig</li> <li>▫ Telephone: +49 (0) 3412120260</li> </ul> </li> </ul>
<b>Technische Universität Chemnitz</b>	<ul style="list-style-type: none"> <li>▪ <b>Prof. Dr. Drik Müller</b> (e-mail: <a href="mailto:muellerd@informatik.htw-dresden.de">muellerd@informatik.htw-dresden.de</a>) <ul style="list-style-type: none"> <li>▫ Former professor in the Faculty for Computer Science at TU Chemnitz</li> <li>▫ Address: Straße der Nationen 62 D-09111 Chemnitz</li> <li>▫ Telephone: +49 (0) 351462 2248</li> </ul> </li> </ul>
<b>Frarzpajohan Co.</b>	<ul style="list-style-type: none"> <li>▪ <b>Prof. Dr. Rasoul Jalili</b> (e-mail: <a href="mailto:jalili@sharif.ir">jalili@sharif.ir</a>) <ul style="list-style-type: none"> <li>▫ Faculty of Department of Computer Engineering, Sharif University of Technology</li> <li>▫ Telephone: +98 (0) 2166166617</li> </ul> </li> </ul>