Hossein Tajalli

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Education

University of Southern California, PhD, Computer Science.	GPA: 3.93	May 2013
University of Southern California, MSc, Computer Science.	GPA: 4.00	2008
University of Tehran, MSc, Electrical Engineering, Telecommunication, Iran.	GPA: 3.24	2005

Technical Skills

Programming Languages: Java, C/C++, VB 6.0, VB.Net
Web Technologies: JSP, HTML, JavaScript, AJAX, XML, WSDL, SOAP, XSD, XSLT
Databases: MySQL, Spatial Oracle, JDBC, ADO.NET, DAO
Platforms: Windows, Linux
Misc: Eclipse Plug-in Development, UML, Rational Rose, Xtex, PowerLoom, MATLAB, SVN, Xtext, Design Patterns

Projects

Distributed Component-based Self-adaptive Applications   2007-Present

- Devised a self-adaptive architecture and approach by leveraging ADL models and AI planning to automatically compose and dynamically adapt applications by adding, removing, and swapping components at runtime.
- Composed fault-tolerant self-adaptive mobile robot applications with layered and peer-to-peer architectural styles that run on top of an event-routing architectural middleware, Prism-MW.
- Designed a multi-threaded event-handlings approach to enhance concurrent component communications.
- Designed a fault-tolerant UDP-based protocol to improve reliability of event communications.

Eclipse Plug-in Development for Component-based Applications   2011

- Designed and implemented Eclipse plug-ins with detachable components and transferred them and their dependencies over network before Eclipse termination to increase availability of adaptation plug-ins.
- Implemented an "Eclipse Editor" with Xtext for an architecture modeling language.
- Designed and implemented an Eclipse plug-in with Graphviz to dynamically visualize the architecture of component-based applications that have dynamic runtime architectures.

Web Applications   2007

- Designed and developed an e-commerce site on apache web server using JSP, JavaScript, Ajax, MySQL, and JDBC featuring session management, user authentication, inventory control, and employee access control.
- Developed web services for the e-commerce site with WSDL & SOAP, to integrate with other sites' services.

Embedded Systems and Robotics   2006-2008

- Designed and implemented the control application and UI for a gantry robot with four degrees of freedom (for construction industry) in VB.Net to manage a PLC unit and several servo motor controllers.
- Designed and implemented a PS-2/USB mouse driver with ADUC-7026 microcontroller to drive a PID controller for the gantry robot.
- Designed and developed VB.Net application to control a rapid prototyping machine that builds 3D objects.

Mobile Robotics   2001-2004

- Designed, fabricated, and programmed digital control boards with MCS-51 microcontrollers for 9 robots and won five 1st prizes in national robotic contests. Involved solving the competition problem and fabricating the robots from scratch. Used neural networks, image processing, and robot navigation techniques.

Database, Networking, and AI Applications   2006-2009

- Designed, developed, and queried a spatial DBMS using Oracle 10g, Java swing, and JDBC.
- Implemented and simulated the Delay-Tolerant Networking (DTN) approach using forking in C++.
- Designed and implemented a knowledge-based application in Java on top of the Powerloom engine.

Work Experience

Senior Engineer, Farineh Co., Tehran, Iran   **Apr 2005- Jul 2006**
- Modeled, implemented, and tested several parts of Foundation Fieldbus™ specification with Rose and C++.
- Designed a hot device redundancy protocol and modeled it in UML.

VB.Net Developer, Freelancer, Tehran, Iran   **Apr 2004-Apr 2005**
- Designed, developed, and deployed a desktop application with three-tier pattern to manage production, sale, and after sale services. Designed and created a relational database with 20+ tables.
- Designed a framework to decrease the implementation and maintenance time of UIs.

Electrical Engineer and Developer, Freelancer, Tehran, Iran   **Oct 2002-Mar 2003**
- Designed, fabricated, and programmed the digital board for a commercial digital scale using the 89C55WD microcontroller in C to read a load cell and control two displays and two keyboards.

VB 6.0 Developer, Freelancer, Tehran, Iran   **Jan 2001-Sep 2002**
- Designed, developed, and deployed four database applications. Used COM Components and DAO.

Publications

[1] iDARE–A Reference Architecture for Integrated Software Environments. *SPE* (invited, to be published).
[2] A Reference Architecture for Integrated Development and Run-time Environments. *TOPI, ICSE'12*.
[3] Engineering Heterogeneous Robotics Systems: A Software Architecture-based Approach. *IEEE Computer'10*.
[4] PLASMA: a Plan-based Layered Architecture for Software Model-driven Adaptation. *ASE'10*.
[5] An architecture-driven software mobility framework. *Journal of Systems and Software*, *JSS'09*.
[6] Architecture-driven self-adaptation and self-management in robotics systems. *SEAMS*, *ICSE'09*.
[7] EM algorithm with sphere decoding for joint channel estimation and detection in MIMO systems. *WOCN'05*.

Awards and Honors

- Outstanding TA award, USC 2009.
- Admitted to top-3 engineering schools in Iran.