

Dr. Luay Alawneh

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EXECUTIVE SUMMARY:

- An academic and industrial software engineering professional possessing extensive knowledge and experience in a wide range of technologies and software engineering methodologies.

EDUCATION:

- Ph.D., Electrical & Computer Engineering (Software Engineering), Concordia University, 2012, Montreal – Canada. *Thesis Title:* “Techniques to Facilitate the Understanding of Inter-Process Communication Traces”.
- M.A.Sc., Electrical & Computer Engineering (Software Engineering), Concordia University, 2006, Montreal – Canada. *Thesis Title:* “Verification & Validation in Systems Engineering Design Models: Applications to UML 2.0 Activity & Class Diagrams”
- BSc, Electrical Engineering (Computer Engineering specialization), Jordan University of Science & Technology, Irbid – Jordan, 1999.

ACADEMIC WORK EXPERIENCE

February 2014 to Present **Jordan University of Science & Technology, Irbid - Jordan**
Assistant Professor, Software Engineering

- **Teaching:**
 - SE432 - Software Engineering for Web Applications: restructured the course by adding new material to cope with the new technology standards.
 - SE441 - Software Quality Assurance: developed this new course for teaching best industrial practices.
 - SE321 - Software Requirements Engineering.
 - SE320 - Software Analysis & Design.
 - SE220 - Software Modeling.
- **Graduation Project Supervisor:** Supervised more than 10 projects in different topics such as Internet of Things (IoT), Document Management Systems, social network applications, Integrated Hospital Management System, Augmented Reality, and Modeling tools.
- **Research Interests:** Explore new areas of research in Software Engineering such as:
 - High Performance Computing (HPC)
 - Green Computing and Cloud Computing.
 - Program analysis of multithreaded real-time distributed systems.
 - Software evolution.
 - Software processes such as XP and Agile.
 - Data mining and pattern recognition.
 - Verification and Validation of software systems models.
 - Voice & Speech Recognition

PUBLICATIONS:

BOOK:

- Verification and Validation in Systems Engineering: Assessing UML/SysML Design Models Mourad Debbabi , Fawzi Hassaine , Yosr Jarraya , Andrei Soeanu , Luay Alawneh

REFEREED JOURNALS:

- H. Pirzadeh, S. Shanian, A. Hamou-Lhadj, L. Alawneh, A. Sharifee, "Stratified Sampling of Execution Traces: Execution Phases Serving as Strata", (in press), the Elsevier Journal on Science of Computer Programming, Special issue on Software Evolution, Adaptability and Maintenance.
- L. Alawneh and A. Hamou-Lhadj, "An exchange format for representing dynamic information generated from High Performance Computing applications," Future Generation Computer Systems, Volume 27, Issue 4, April 2011, Pages 381-394.
- Y. Jarraya, A. Soeanu, L. Alawneh, M. Debbabi, and F. Hassaine, "Synergistic Verification and Validation of Systems and Software Engineering Models," International Journal of General Systems, Volume 38, Issue 7 October 2009 , pages 719 - 746.

REFEREED CONFERENCES:

- L. Alawneh, , A. Hamou-Lhadj, J. Hassine, "Towards a Common Metamodel for Traces of High Performance Computing Systems to Enable Software Analysis Tasks," In Proc. of 22nd International Conference on Software Analysis, Evolution, and Reengineering, (SANER15).
- L. Alawneh, A. Hamou-Lhadj, S. S. Murtaza, and Y. Liu, "A Contextual Approach for Effective Recovery of Inter-process Communication Patterns," In the Proceedings of WCRE/CSMR 2014, 10 pages, 2014.
- L. Alawneh and A. Hamou-Lhadj, "Identifying Computational Phases from Inter-Process Communication Traces of HPC Applications", In the Proc. of the International Conference on Program Comprehension (ICPC 2012), 2012.
- L. Alawneh and A. Hamou-Lhadj, "MTF: A Scalable Exchange Format for Traces of High Performance Computing Systems", In the Proc. of the International Conference on Program Comprehension (ICPC 2011), 2011.
- L. Alawneh and A. Hamou-Lhadj, "Pattern Recognition Techniques Applied to the Abstraction of Traces of Inter-Process Communication", In the Proc. of the European Conference on Software Maintenance and Reengineering (CSMR 2011), 2011.
- H. Pirzadeh, L. Alawneh, A. Hamou-Lhadj, "Quality of the Source Code for Design and Architecture Recovery Techniques: Utilities are the Problem", in Proceedings of the 1st IEEE International Workshop on Data Quality for Software Engineering (DQ4SE 2009) in conjunction with the 9th International Conference of Software Engineering - QSIC'09.
- L. Alawneh, M. Debbabi, F. Hassaine, A. Soeanu: On the verification and validation of uml structural and behavioral diagrams. ACST 2006: 304-309
- L. Alawneh, M. Debbabi, Y. Jarraya, A. Soeanu, F. Hassaine: A Unified Approach for Verification and Validation of Systems and Software Engineering Models. ECBS 2006: 409-418
- L. Alawneh, M. Debbabi, F. Hassaine, Y. Jarraya, P. Shahi, A. Soeanu: Towards a Unified Paradigm for Verification and Validation of Systems Engineering Design Models. IASTED Conf. on Software Engineering 2006: 282-287.

BOOK CHAPTER:

- L. Alawneh and A. Hamou-Lhadj, "Execution Traces: A New Domain that Requires the Creation of a Standard Metamodel", book chapter in the book series "Communications in Computer and Information Science", Springer Berlin Heidelberg, 2009.

ARTICLES UNDER REVIEW:

- L. Alawneh and A. Hamou-Lhadj, J. Hassine, "Segmenting Large Traces of Inter-Process Communication with a focus on High Performance Computing Systems," submitted to Journal of Systems and Software (JSS).

INDUSTRIAL WORK EXPERIENCE:

April 2012 to August 2014 **Nuance Communications, Montreal - Quebec**
Senior Software Developer Engineer R&D

Duties and Responsibilities:

- Proposing new solutions to optimize the Nuance Speech Server (NSS).
- Analysis of the Nuance Speech Server (NSS).
- Development of new features in NSS.
- Designing of new features by applying design patterns.
- Writing project specifications using the Unified Modeling Language.
- Multithreading programming.
- Agile software development.
- C/C++ under Linux.
- Protocols: SIP, MRCP, HTTP, and TCP.
- Tools: Clearcase, Subversion, Jira, ClearQuest and Rally.

Main Projects:

- Embedding libmicrohttpd in NSS: Improved NSS to work as an HTTP server in order to enable the different components in the framework to send commands to NSS using the http protocol.
- Language Reload: In order to apply the minor modifications for the language models, NSS should restart its service. The Language Reload project intends to overcome this issue by responding to http requests to reload the language models at runtime. This project improved NSS by reducing the downtime of NSS when new language updates are available. Client: Apple
- Enrolment From Transcription (EFT): Users of voice recognition systems should be able to adapt the acoustic models in their user profiles to their voices by reading a transcription. The purpose of this project is to improve the accuracy of the recognition. Client: Intel.
- Caching of user Language Models: NSS should not rebuild a Language Model from user information for each request. This project aims to cache the Language Model (LM) in the user profile in order to save the time to rebuild the LM during each request. The LM should only be rebuilt when the user's information change. Client: Samsung.

May 2006 to April 2011 **Rockwell Automation, Montreal - Quebec**
Proposals & Estimation Applications Manager

Duties and Responsibilities:

- Application architecture, development and maintenance including analysis, design, coding, testing, implementation and change management.
- Identifying secondary impacts caused by changes to the existing systems.
- Gathering the requirements directly from the business stakeholders and writing functional requirements.

- Ensure business requirements are identified, documented and met.
- Converting business requirements into technical specifications.
- Preparation of the technical documentation for the change management process which includes: pre-implementation test plan, post-implementation test plan, implementation plan and back-out plan.
- Prepared test data and system testing according to the prepared test plans.
- Performed application development following the Agile lifecycle software development methodology. Worked in a team of six members. Luay was responsible for leading the development of the Frontlog Tracking System and the Approval Request system.

Projects:

- *iPE Proposals & Estimating Tools*: Developed a set of modules for the Estimating and Proposals department at Rockwell Automation. The main two modules that I worked on are the Frontlog Tracking System (FTS) and the Request Approval System. FTS is a group of Lotus Notes applications used to identify and track predicted revenue for Proposed project Opportunities. Frontlog data is a leading indicator of Rockwell business health and reported monthly to Senior Management. Every user of FTS has a profile that determines his role and other information required by the system. A new opportunity is added to FTS either by receiving a new Bid Request through the online Bid Request form or directly from FTS. A new opportunity can also be imported from an excel sheet called (PWO). The Bid Request system is an online application that is used by the sales engineers to enter possible opportunities (Bid Requests). These Bid Requests are then imported using the proposal leaders using the Frontlog Tracking System. Sales engineers can access this application using Blackberry to enter new bids into the Bid Request database. Bid Requests can also be entered into an Oracle database. Luay performed the architecture and development based on J2EE architecture. A LotusScript agent is responsible for fetching the bid requests from the Oracle database into the Lotus Notes Bid Request database. A main module in FTS is the Risk Factor Calculator. The Risk Factor Calculator determines the approval level based on different risk factors. The approval level of each risk factor is determined using a business rule that is defined in a profile document. The total Approval Level Required is determined from the highest Risk Factor approval level. Another module in FTS is the Automatic Email Notification System: Luay designed and developed an email notification agent that is configurable by keyword documents that hold the business logic for notifications. New notification types can be added to the system without the need to update the source code. The main advantage of the agent is the separation of the business logic from the source code. Finally, the Request Approval System is a workflow system that governs the approvals of various request types and is being used by all businesses at Rockwell. This system is integrated with the FTS were an FTS opportunity should be approved using this system. Moreover, I developed a SOAP web service to publish the risk factor calculator so it can be used by other systems at Rockwell Automation. iPE applications depend on other modules such as Customer Database, Bid Request System and Distributors database.
- *Customer Satisfaction Survey*: Luay was responsible for the architecture and development of a standard template for customer satisfaction survey in a web-based survey in a Domino environment. The survey is implemented in several locations like NA, EMEA, LA and AP. Some surveys in Europe supported up to 12 different European languages. New languages can be supported by creating a profile document for each new language. A Lotus Notes database where agents are written in Java.
- *Online Event Registration and Reservation database*: Luay was responsible for the architecture and development of an online form for event registration and reservation. The application includes a calendar for selecting events. This is a web form that contains a lot of JavaScript. Lotus Notes agents were written in Java.
- *Channel Extranet*: Luay participated in the development of an enterprise system that consists of many databases distributed for many regions. It is accessed by distributors and Rockwell employees. This application supports the following languages: English, French, Spanish, German, Africans, and others. This is a complex Lotus Notes application that has many different modules such as user registration, article publishing, and sales engineer approval.
- *Demos Online*: Luay developed a product demo reservation system which consists of two applications for administration and a web interface used by end users. These are two different web applications for reservation of Demos for Rockwell's products. This includes a reservation cart. Business logic was coded in Java. Used HTML, CSS and JavaScript in the web forms. A Java Servlet was developed to

handle the shopping cart. These two applications run on an Apache webserver and use an Oracle database.

Jan. 2004 to May 2006

Concordia Institute for Information Systems Engineering

Programmer/Analyst and Research Assistant

- Designed and implemented a verification tool to measure the validity of workflow systems modeled using UML 2.0 activity diagrams. NuSMV model checker was used to verify the system properties.
- Designed and implemented a verification tool to measure the correctness of class diagrams in UML 2.0.
- Programming in Java using NetBeans 3.6 & 4 and Eclipse.
- Visual Basic 6.0, Visual Basic .NET, and C++ 6.0 programming.
- Integration with Artisan Real-time studio database using OLE.

May 2002 - December 2003

W.J. TOWELL COMPUTER SERVICES

CRM Application Developer

- Designed and Developed the Document Management System for the Ministry of Housing and Electricity Using Visual Basic & Lotus Notes.
- Designed Developed the Document Management System for the Ministry of Religious Affairs and Endowments using ArabDox Document Management System.
- Developed the Agricultural Census System for the ministry of Agriculture on the Pocket PC using Embedded Visual Basic 6.0 and SQLCE database.
- Designed Developed the Educational System for Muscat College using Visual Basic 6.0 and Oracle Database.

August 2000 - May 2002

LEAPONE EXECUTIVE CONSULTING

Programmer

- Developing and Designing Workflow systems using Lotus Notes R5 (LotusScript & Lotus Formula programming, JavaScript)
- Developing Workflow applications using Lotus Workflow.
- Maintaining and Supporting the Clients' Management Information Systems.
- Domino Server Administration and Database Administration.

Oct. 1999 – Aug. 2000

JORDAN-UNITED STATES BUSINESS PARTNERSHIP

Software Developer

- Participated in the development of the company's Management Information system using Lotus Notes Database development.

CERTIFICATIONS

- ITIL v3 Foundation Certification.
- IBM Certified Developer.