Maged Elaasar

http://magedelaasar.com/contact/

Profile

A highly motivated, self-driven, and well-accomplished computer scientist and software/systems architect. A technology and team leader with 20 years of experience in leading R&D projects of different sizes and complexities. A subject matter expert in model-driven software engineering model-based systems engineering and semantic web technologies. A strong contributor to open source development at Eclipse and open standards at OMG. A master inventor with 12 filed U.S. patents. An accomplished scholar with many peer-reviewed publications, invited talks, affiliations with international R&D labs, and memberships in R&D program committees and review boards. An entrepreneur with a zest for leadership, innovation and business growth.

Technology Interests

Eclipse Development, Model-Driven Architecture, Web Development, Semantic Web, Service Oriented Architectures, and Systems Engineering

Research Interests

Computer science, software engineering, model-driven engineering, model based systems engineering, semantic web, pervasive computing, communications, and analytics.

Education

Ph.D., Electrical and Computer Engineering, Carleton University (2012)
- Specialization: Software Engineering
- Thesis: An Approach to Pattern and Anti-Pattern Detection in MOF Based Modeling Languages
- Supervisors: Lionel Briand and Yvan Labiche

M.Sc., Computer Science, Carleton University (2003)
- Specialization: Satellite Communication
- Thesis: XSTP: an eXtended Satellite Transport Protocol
- Supervisors: Evangelos Karanakis and Michel Barbeau

B.Sc., Computer Science, American University in Cairo (1996)
- Honor: Summa Cum Laude – GPA: 3.93/4.0
- Minor: Business Administration

Professional Experience

Senior Software Architect, NASA Jet Propulsion Laboratory, USA (July 2014 – Present)
- Defined a reference architecture for a Model-Based Engineering Environment

- o The architecture supports the JPL 10 systems engineering functions
- o Modeled the architecture in SysML using the OOSEM methodology
- o Generated an Architecture Description Document from the model
- Defined a development environment for ontology-driven domain-specific modeling tools
  - o Defined an Eclipse-based ontology modeling language and tool
  - o Used the tool to specify ontologies for various system engineering domains
  - o Used the specified ontologies to define domain-specific tools for system engineering
- Defined an architecture for a resilient and autonomous robotic space system
  - o The architecture is componentized and multi-layer
  - o Modeled the architecture in SysML using the OOSEM methodology
  - o Produced an Architecture Description Document and Interface Control Document
- Developed a tool-neutral operation API for UML 2.5 in Scala
  - o Developed the API using functional programming techniques in Scala
  - o Generated the API from the metamodels using Acceleo model to text technology
  - o Implemented adapters for the API to work with Papyrus and MagicDraw tools

Software Consultant, Commissariat à l'Energie Atomique, France (April 2014 – Present)
- Developed a reference implementation of the Diagram Definition 1.0 specification
- Developed a reference implementation of the UML Diagram Definition 1.0 specification
  - o Defined the graphical syntax of all 14 UML diagrams with it
- Developed a UML diagram exporter from the Papyrus tool to the standard format
- Developed a declarative viewpoint architecture to enable customizing the Papyrus UML tool with domain-specific views
- All development was on Eclipse using Java, Javascript, QVTO, MTL, Xtend

Software Consultant, Coral CEA, Canada (October 2013 – June 2014)
- Jasper Integration Middleware for Healthcare Applications
  - o Developed a custom Mule Studio connector to a JMS-based query server
  - o Developed an Eclipse tool to model healthcare metadata and APIs with OWL
  - o Coached a small team in using MDE and semantic technologies

Senior Software Architect, IBM, Canada (June 2000 – July 2013)
- Domain Definition Toolkit (DTK), Rational Design Management v4.0
  - o Developed customizable web-based modeling tools using Java/Javascript
  - o Defined the syntax and behavior of a modeling domain using OWL ontologies
  - o Implemented OSLC specification to allow integration with other lifecycle tools
  - o Used the project to develop tools for standard modeling domains (UML and BPMN)
  - o Authored papers and delivered presentations on the project
  - o Acted as an architect for a team of 15 developers
- Model Analysis and Traceability, Rational Software Architect v8.0
  - o Designed an extensible framework for defining model checking rules and metrics
  - o Used the framework to define many rules and metrics for the UML domain
  - o Designed an approach to establish traceability between related model elements
  - o Defined rules that leveraged traceability links to perform change impact analysis
  - o Lead a team of 3 developers
- Model Reporting with BIRT, Rational Software Architect v7.5

- o Designed an extension of the BIRT framework on Eclipse to support EMF models
- o Defined a mapping from EMF models to relational databases
- o Designed a BIRT template to generate the UML 2.5 specification from metamodel
- Model-to-Model Transformation Authoring Framework, Rational Software Architect v7.0
  - o Designed a domain-specific language for visual model-to-model mapping
  - o Defined a JET template to translate a M2M mapping into a Java-based transformation
  - o Developed the framework on Eclipse and used it to define many transformations
  - o Lead a team of 2 people
- Graphical Modeling Framework (GMF), Rational Software Architect v6.0
  - o Designed a framework for building graphical modeling editors on Eclipse using Java
  - o Architected the framework by integrating the GEF and EMF projects on Eclipse
  - o Allowed the framework to be highly customizable for a modeling domain
  - o Used the framework to develop tools for UML and BPMN modeling domains
  - o Contributed the framework to open-source and helped its adoption by many projects
  - o A lead a team of 10 developers
- UML Diagram Editors, Rational XDE v1.0
  - o Developed several UML 1.4 diagram editors for Eclipse (Java) and .NET (C++/ATL)
- Realtime Diagram Editors, Rational Rose RealTime v2001
  - o Developed the Capsule and Protocol diagram editors

Software Consultant, Crossplatform Software, Canada (January 2012 – Present)
- Scriptobia for SecondLife
  - o Developed a line of virtual gadgets for the SecondLife platform
  - o Maintained an active online store to sell the gadgets

Software Consultant, Corel, Canada (November 1997 – June 2000)
- CorelDRAW v8.0 for Mac
  - o Developed importers/exporters for raster/vector image formats in C++
  - o Developed graphics rendering engine and a plug-in engine in C++
  - o Developed TWAIN protocol for scanners and digital cameras in C++

Software Consultant, ITWorx, Egypt (February 1996 – October 1997)
- MimioStudio for Mac
  - o Developed a device driver for a set of wireless pens drawing on a whiteboard using C
  - o Developed an application to save pen strokes on a white board to an image using C++

Research Experience

Member of Industrial Advisory Board, U-Test Project (March 2015 – Present)
- U-Test is a EU Horizon 2020 funded research project led by Simula Research Lab, Norway
- U-Test is a project on model-based testing of cyber physical systems with uncertainty
- Engaged in research activities and reviewed the project's milestones

Research Fellow, University of Luxembourg (March 2015 – Present)
- Engaged in research activities is software and systems engineering with the SnT Center.
- Developed research proposals and provided R&D consultancy to lab members

Adjunct Research Professor, Carleton University (October 2012 – Present)
- Member of Software Quality Lab, Department of Systems and Computer Engineering
- Carried research in the areas of software engineering and model driven engineering
- Collaborated with CRuiSE research groups at Ottawa University on common projects
- Supervising a Ph.D. student's research in UML consistency analysis
- Defined and co-chaired a workshop on UML consistency analysis alongside MODELS'15
- Published numerous papers in top tier conferences and journals

Thesis Supervisor, University of Calgary (December 2015 – Present)
- Supervising a Ph.D. student's research in Software Product Lines

Visiting Scientist, IBM Center for Advanced Studies (June 2012 – 2014)
- Represented IBM in the NECSIS research partnership with 9 Canadian research groups
- Carried research in the area of complex software-intensive systems for automotive domain
- Co-authored papers with several groups like MASE (Queens U) and MSDL (McGill U).
- Facilitated technology transfer of research results to IBM and built industrial case studies

Adjunct Researcher, American University in Cairo (January 2012, 2014)
- Member of the MOPEC research group, Department of Computer Science and Engineering
- Carried research in the area of mobile and pervasive computing
- Co-supervised graduate students and co-authored research papers

Ph.D. Candidate, Carleton University (January 2003, August 2012)
- Studied at the Department of Systems and Computer Engineering
- Defined a new approach to detect design patterns and anti-patterns in MOF-based models
- Prototyped the approach and carried three large case studies (two industrial) validating it
- One case study led to the identification and fixing of 53% of issues in the UML metamodel
- Wrote a dissertation and published three refereed papers (one journal and two conferences)

Master Candidate, Carleton University (January 1998, January 2003)
- Studied at the Department of Computer Science
- Defined a satellite transport protocol that effectively handled transmission errors in space
- Validated the protocol via simulation (150% more throughput, 150% less energy than TCP)
- The protocol was selected later for testing in a real cube satellite mission (CANX-2)

Standards Experience

Contributor, Open Services for Lifecycle Collaboration Group (January 2013 – July 2013)
- Member of the OSLC Architecture Management 2.0 Revision Task Force

Contributor, Object Management Group (January 2008 – Present)
- Official representative for IBM (2008-2013) and JPL (since 2014)
- Co-chair of the UML (2.3, 2.4) Revision Task Force
- Co-Chair of the Diagram Definition 1.0 Finalization Task Force

- Co-Chair of the Diagram Definition 1.2 Revision Task Force
- Author of Annex B in UML 2.5 and Chapter 12 of BPMN 2.0 specifications
- Voting Member of MOF, XMI 2.4, and OCL 2.3 Revision Task Forces
- Member of the Model Interchange Working Group
- Member of committee putting certification test questions for UML

Teaching Experience

Academic Instructor, Carleton University, Canada (September 2013 – June 2014)
- Taught Foundations of Imperative Programming (Undergraduate Course)
- Taught Model-Driven Engineering in Practice (Graduate Course)

Languages

- English (Full proficiency)
- Arabic (Full proficiency)
- French (Elementary proficiency)
- German (Elementary proficiency)

Nationality/Residency

- Canadian citizen
- USA permanent resident

Maged Elaasar's R&D Portfolio
(Follow the links to view the documents)

Patents

- Elaasar, M.: Detecting Design Patterns in Models by Utilizing Transformation Language, US 20120192143, January 2011.
- Elaasar, M.: Method and Apparatus of Specifying the Concrete Syntax of Graphical Modeling Languages, US 20110131546, December 2009.
- Elaasar, M.: Method and System Defining and Interchanging Diagrams of Graphical Modeling Languages, US 20110131547, December 2009.
- Elaasar, M., Boyersmith, M., Dubauski, B.: Database Mapping of Models for Reporting Tools in Model Driven Development, US 20110004612, July 2009.
- Elaasar, M.: Computer Method and Apparatus for Chaining of Model-To-Model Transformations, US 20090150125, December 2007.
- Elaasar, M., Fischer, J.: UML Profile Transformation Authoring Method and System, US 20090150856, December 2005.
- Elaasar, M.: Computer Method and Apparatus for Providing Model to Model Transformation Using an MDA Approach, US 20090150854, December 2007.
- Elaasar, M.: Computer Method and Apparatus for Model Transformation Reapply, US 20090150855, December 2007.
- Elaasar, M.: Configurable Pattern Detection Method and Apparatus, US 20080134135, December 2006.
- Elaasar, M.: Computer Method and System for Pattern Specification Using Meta-Model of a Target Domain, US 20080127049, November 2006.
- Elaasar, M.: Generic Markup Specified Object Descriptor for a Modularized Computing Application, US 20070089084, October 2005.
- Elaasar, M., Hanner, M., Shaw, S.: Optimized Computer Diagramming Method, US 20070011189, July 2005.

Publications

Refereed Journal Papers
- Bock, C., Elaasar, M.: Reusing Metamodels and Notations with Diagram Definition. Submitted to Software and Systems Modeling Journal (**to appear**)
- Hamza, M., Aly, S., Elaasar, M.: Automated Generation of Pervasive Systems Architectures: A Detailed Empirical Evaluation. International Journal of Software Engineering, Technology and Applications, Vol. 1, No. 1, 2015.
- Elaasar, M., Briand, L., Labiche, Y.: VPML: An Approach to Detect Design Patterns of MOF-Based Modeling Languages. Software & Sysems Modeling, DOI 10.1007/s10270-013-0325-9, January 2013.
- Elaasar, M., Barbeau, M., Kranakis, E., Li, G.: Satellite Transport Protocol Handling Bit Corruption, Handoff and Limited Connectivity. IEEE Transactions on Aerospace and Electronic Systems, vol. 41, issue 2, pp. 489-502, April 2005.

Refereed Conference Papers

- Elaasar M., Badreddin, O. "Comparing Two Approaches Where Modeling Meets Programming: Alf and Umple." (to appear in ISOLA'16).
- Karban, R., Jankevičius, N., Elaasar, M. "Creating System Engineering Products with Executable Models in a Model Based Engineering Environment." Proceedings of Modeling, Systems Engineering, and Project Management for Astronomy VI, Edinburgh, UK, 2016.
- Karban, R., Jankevičius, N., Elaasar, M. "ESEM: Automated Systems Analysis using Executable SysML Modeling Patterns." Proceedings of INCOSE International Symposium (IS), Edinburgh, Scotland, 2016.
- Torre, D., Labiche, Y., Genero, M., Elaasar, M. "1st International Workshop on UML Consistency Rules (WUCOR 2015): Post workshop report." ACM SIGSOFT Software Engineering Notes, volume 41, issue 2, March 2016.
- Baderddin, O., Elaasar, M., Hamou-lhadj, A. "A Controlled Experiment for Evaluating the Comprehensibility of UML Action Languages." Proceedings of MODELSWARD '16, Rome, Italy, 2016.
- Torre, D., Labiche, Y., Genero, M., Elaasar, M. "UML Consistency Rules in Technical Books." (To appear in ISSRE15, Washington DC, USA)
- Fouche, A., Noyrit, F., Gerard, S., Elaasar, M.: "Systematic Generation of Standard Compliant Tool Support of Diagrammatic Modeling Languages". (To appear in MODELS 2015, Ottawa, Canada).
- Badreddin, O., Lethbridge, T., Forward, A., Elaasar, M., Aljamaan, H., Garzon, M.: Enhanced Code Generation from UML Composite State Machines. Proceedings of MODELSWARD 2014: 235-245, Lisbon, Portugal, January 2014.
- Fischer, M., Dingel, J., Elaasar, M., Shaw, S.: Automating Instance Migration in Response to Ontology Evolution. Proceedings of Models & Evolution 2013 Workshop, pp. 20-27, Miami, FL, September 2013.
- Elaasar, M., Neal, A.: Integrating Modeling Tools in the Development Lifecycle with OSLC: a Case Study. Proceedings of MODELS 2013, LNCS, vol. 8107, pp. 154-169, Miami, FL, October 2013.
- Elaasar, M., Conallen, J.: Design Management: a Collaborative Design Solution. Proceedings of ECMFA '13, LNCS 7949, pp. 165, July 2013.
- Badreddin, O., Lethbridge, T. C., Elassar, M.: Modeling Practices in Open Source Software, Proc. of 9th Int'l Conf. on Open Source Systems, Koper, Slovenia, June, 2013
- Elaasar, M., Labiche, Y.: Model Interchange Testing: a Process and a Case Study. Proceedings of ECMFA '12, Lyngby, Denmark, July 2012.
- Elaasar, M., Labiche, Y.: Diagram Definition: a Case Study with the UML Class Diagram. Proc. of MoDELS '11, LNCS, vol. 6981, pp. 364-378, Wellington, NZ, October 2011.
- Elaasar, M., Briand, L., Labiche, Y.: Domain-Specific Model Verification with QVT. Proc. of ECMFA '11, LNCS, vol. 6689, pp. 282-298, Birmingham, England, June 2011.
- Elaasar, M., Briand, L., Labiche, Y.: A Metamodeling Approach to Pattern Specification. Proc. of MoDELS '06, LNCS, vol. 4199, pp. 484-498, Genoa, Italy, October 2006.
- Elaasar, M., Li, G., Barbeau, M., Kranakis, E.: The eXtended Satellite Transport Protocol: Its Design and Evaluation. Proceedings of 17th AIAA/USU Conference on Small Satellites, Logan, Utah, August 2003.

Industry Standards
- Elaasar, M.: Diagram Definition (DD) v1.0, OMG Specification, formal/2012-07-01
- Elaasar, M.: Annex B: UML Diagram Interchange, Unified Modeling Language (UML) v2.5, OMG Specification, ptc/2012-10-24
- Elaasar, M.: Chapter 12: BPMN Notations and Diagrams, Business Process Modeling Notation (BPMN) v2.0, OMG Specification, formal/2011-01-03

Invited Talks

- Elaasar, M.: Automated System Analysis Using Executable SysML Modeling Patterns. CEA LIST, Paris, France, March 25, 2016.
- Elaasar, M.: System Modeling Environment: Requirements, Architecture and Implementation. Simula Research Lab, Oslo, Norway, October 27, 2015.
- Elaasar, M.: OMG Specification Development Using Papyrus. Workshop on Model-Driven Specification Authoring. Cambridge, MA, September 24, 2015.
- Elaasar, M.: An Approach for Defining Tool-Neutral API for a Modeling Language. SnT Center, University of Luxembourg, Luxembourg, June 25, 2015.
- Elaasar, M.: Diagram Definition in Papyrus 1.0. Papyrus Workshop, Toulouse, France, June 20, 2015.
- Elaasar, M.: Towards a More Collaborative and Integrated Approach to Software Design. Simula Research Lab., Oslo, Norway, July 8, 2013.
- Elaasar, M.: Design Management: When Model Driven Engineering Embraces the Semantic Web. NECSIS 2012, Gatineau, QC, May 29, 2012.
- Elaasar, M.: Diagram Definition: an Overview. Third OMG / Eclipse Symposium, Washington DC, March 25, 2012.
- Elaasar, M.: Generating Specification Documents from Models using BIRT. Second OMG / Eclipse Symposium 2010, Minneapolis, MN, June 22, 2010.
- Elaasar, M.: Diagram Definition: Revised Submission. ADTF, OMG, Washington, DC, March 22, 2010.
- Elaasar, M.: Diagram Definition: Initial Submission. ADTF, OMG, San Jose, Costa Rica, June 24, 2009.
- Elaasar, M.: Model Reporting with IBM Rational Software Architect 7.5: An Introduction. IBM Rational Innovate 2009, Orlando, Florida, June 3, 2009.
- Elaasar, M.: Meeting Customer's Reporting Requirements by Extending BIRT. EclipseCon 2008, Santa Clara, California, March 18, 2008.

Research Services

Member of Program Committee
- MODELS Conference, 2016
- ECMFA Conference, 2016
- MODELSWARD Conference, 2016
- OSS4MDE Workshop, 2015
- MODELS Conference, 2015

- [ECMFA](#) Conference, 2015
- [CSER](#) Conference, 2015

Member of Organization Committee
- [WUCOR](#) Workshop, 2015

Reviewer
- [ISOLA](#) Conference, 2016
- [Software and Systems Modeling (SoSyM)](#) Journal, 2012