

GEORGE EDWARDS

University of Southern California

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EDUCATION

- **Ph.D. Program in Computer Science**, University of Southern California, expected Dec 2009
Advisor: Nenad Medvidovic
Coursework: Software architecture, software engineering for embedded systems, artificial intelligence, database systems, compiler design, 3D graphics rendering, distributed systems, algorithms
GPA: 3.92
- **M.S. in Computer Science**, University of Southern California, conferred May 2006
Advisor: Nenad Medvidovic
Coursework: Same as above
GPA: 3.94
- **M.S. Program in Computer Science**, Vanderbilt University, Aug 2003 – May 2004
Advisor: Douglas C. Schmidt
Coursework: Pattern-oriented software design, model-integrated computing, component middleware
GPA: 4.00
- **B.S. in Computer Science with Minor in Mathematics**, Vanderbilt University, conferred Aug 2003
Advisors: Douglas C. Schmidt and Gautam Biswas
Coursework: Algorithms/theory, computer architecture, discrete mathematics, linear algebra, graphics and animation, software engineering, network hardware, distributed/Web computing, databases, operating systems, info/network security
GPA: Overall – 3.784; Major – 3.923
- Non-degree seeking student, University of Nebraska-Lincoln, Aug 1998 – Aug 2000
Attended classes while in high school
Coursework: Differential equations, computer programming
GPA: 3.833

ACADEMIC RESEARCH EXPERIENCE

- **Graduate Fellow**, Center for Systems and Software Engineering, University of Southern California, Aug 2004 – Present
Research on software architecture, middleware, and mobile and embedded systems.
 - Designed and implemented XTEAM, a model-driven design environment that allows software architects to create domain-specific software architectures and evaluate those architectures with respect to quality metrics.
 - Implemented enhancements to Prism-MW, an component-oriented middleware platform for mobile and embedded systems. Contributed to the design of MIDAS, a family of sensor network applications built on top of Prism-MW.
- **Graduate Research Assistant**, Institute for Software-Integrated Systems, Vanderbilt University, Sept 2003 – May 2004
Research on middleware and modeling for component-based distributed, real-time, embedded (DRE) systems.
 - Developed a CORBA Component Model (CCM) framework that supports application access to highly optimized and scalable event-based communication services.
 - Created a modeling language and supporting toolset that allow the specification of quality-of-service policies in large-scale, event-driven DRE systems.
- **Undergraduate Research Assistant**, Computer Science Department, Vanderbilt University, May 2003 – Aug 2003
Designed regression tests and enhanced support for key capabilities in a real-time CORBA implementation.

INDUSTRY RESEARCH AND ENGINEERING

- **Graduate Research Intern**, T.J. Watson Research Center, IBM Research, May 2008 – Aug 2008
Research on software and services for enterprise mobility.
 - Developed elements of BlueStar, a scalable mobile device management and provisioning system.
 - Co-designed Proxima, a context-aware search service for mobile devices.
- **Software Architecture Intern**, The Boeing Company, Huntington Beach, CA, June 2005 – Aug 2006
Member of the software architecture team for the Future Combat Systems (FCS) project.
 - Led and coordinated one of the software architecture modeling and analysis efforts using state-of-the-art model-driven engineering (MDE) technologies.
 - Created and evaluated architecture descriptions and guidance memoranda, requirements specifications, design models, trade studies, risk analyses, and development schedules.

JOURNAL PUBLICATIONS

- Nenad Medvidovic and George Edwards, *Software Architecture and Mobility: A Roadmap*, Journal of Systems and Software (JSS): Special Issue on Software Architecture and Mobility, 2009.
- Nenad Medvidovic, Hossein Tajalli, Joshua Garcia, Yuriy Brun, Ivo Krka, George Edwards, Marija Mikic-Rakic, Sam Malek, and Gaurav Sukhatme, *An Architecture-Driven Software Mobility Framework*, submitted to the Journal of Systems and Software (JSS): Special Issue on Software Architecture and Mobility, 2009.
- George Edwards, Chiyong Seo, and Nenad Medvidovic, *Model Interpreter Frameworks: A Foundation for the Analysis of Domain-Specific Software Architectures*, Journal of Universal Computer Science (JUCS): Special Issue on Software Components, Architectures and Reuse, 2008.
- Aniruddha Gokhale, Krishnakumar Balasubramanian, Jaiganesh Balasubramanian, Arvind Krishna, George T. Edwards, Gan Deng, Emre Turkay, Jeffrey Parsons, and Douglas C. Schmidt, *Model-Driven Middleware: A New Paradigm for Deploying and Provisioning Distributed Real-time and Embedded Applications*, Elsevier Journal of the Science of Computer Programming: Special Issue on Model Driven Architecture, 2005.

CONFERENCE PUBLICATIONS

- Yuriy Brun, George Edwards, and Nenad Medvidovic, *Online Reliability Improvement via Smart Redundancy in Systems with Faulty and Untrusted Participants*, in submission.
- Ivo Krka, George Edwards, Yuriy Brun and Nenad Medvidovic, *Synthesizing Partial Component-Level Behavior Models from System Specifications*, Proceedings of the 7th Joint Meeting of the European Software Engineering Conference and ACM SIGSOFT Symposium on the Foundations of Software Engineering (ESEC/FSE), August 2009.
- Joshua Garcia, Daniel Popescu, George Edwards and Nenad Medvidovic, *Toward a Catalogue of Architectural Bad Smells*, Proceedings of the 5th International Conference on the Quality of Software Architectures (QoSA), June 2009.
- Ivo Krka, George Edwards, Yuriy Brun and Nenad Medvidovic, *From System Specifications to Component Behavioral Models*, New Ideas and Emerging Results Track, Companion Volume of the 31st International Conference on Software Engineering (ICSE), May 2009.
- Joshua Garcia, Daniel Popescu, George Edwards and Nenad Medvidovic, *Identifying Architectural Bad Smells*, Proceedings of the 13th European Conference on Software Maintenance and Reengineering (CSMR), March 2009.
- Steve Mastrianni, David Bantz, Terrence Buechner, Tom Chefalas, George Edwards, Song Jinho, Dong Jun Lan, Gary Leonardi, Leslie Liu, Randy Moulic, Dennis G. Shea, Andrew Wyskida, *BlueStar: Managed Services for Enterprise Mobility*, Proceedings of the IEEE International Conference on e-Business Engineering (ICEBE), October 2008.

- George Edwards, Leslie S. Liu, and Randy Moulic, *Proxima: A Mobile Augmented-Image Search System*, Proceedings of the ACM International Conference on Multimedia (ACMMM), October 2008.
- George Edwards and Nenad Medvidovic, *A Methodology and Framework for Creating Domain-Specific Development Infrastructures*, Proceedings of the 23rd IEEE ACM International Conference on Automated Software Engineering (ASE), September 2008.
- Chiyoung Seo, George Edwards, Sam Malek and Nenad Medvidovic, *A Framework for Estimating the Impact of a Distributed Software System's Architectural Style on its Energy Consumption*, Proceedings of the Working International Conference on Software Architecture (WICSA), February 2008.
- George Edwards, Chiyoung Seo, and Nenad Medvidovic, *Construction of Analytic Frameworks for Component-Based Architectures*, Proceedings of the Brazilian Symposium on Software Components, Architectures and Reuse (SBCARS), August 2007.
- Gan Deng, Ming Xiong, Aniruddha Gokhale, and George Edwards, *Evaluating Real-time Publish/Subscribe Service Integration Approaches in QoS-enabled Component Middleware*, Proceedings of the 10th IEEE International Symposium on Object-oriented Real-time Distributed Computing (ISORC), May 2007.
- George Edwards, Sam Malek, and Nenad Medvidovic, *Scenario-Driven Dynamic Analysis of Distributed Architectures*, Proceedings of the 10th International Conference on Fundamental Approaches to Software Engineering (FASE), March 2007.
- George Edwards, Gan Deng, Douglas C. Schmidt, Aniruddha Gokhale, and Balachandran Natarajan, *Model-Driven Configuration and Deployment of Component Middleware Publisher/Subscriber Services*, Proceedings of the 3rd ACM International Conference on Generative Programming and Component Engineering (GPCE), October 2004.
- George Edwards, Douglas C. Schmidt, Aniruddha Gokhale, and Bala Natarajan, *Integrating Publisher/Subscriber Services in Component Middleware for Distributed Real-time and Embedded Systems*, Proceedings of the 42nd Annual ACM Southeast Conference (ACMSE), April 2004.

WORKSHOP PUBLICATIONS

- Chiyoung Seo, George Edwards, Daniel Popescu, Sam Malek and Nenad Medvidovic, *A Framework for Estimating the Energy Consumption Induced by a Distributed System's Architectural Style*, Proceedings of the 8th Workshop on Specification and Verification of Component-Based Systems (SAVCBS), August 2009.
- George Edwards, Joshua Garcia, Hossein Tajalli, Daniel Popescu, Nenad Medvidovic, Gaurav Sukhatme, and Brad Petrus, *Architecture-Driven Self-Adaptation and Self-Management in Robotics Systems*, Proceedings of the Workshop on Software Engineering for Adaptive and Self-Managing Systems (SEAMS), May 2009.
- Ivo Krka, Leslie Cheung, George Edwards, Leana Golubchik and Nenad Medvidovic, *Architecture-Based Software Reliability Estimation: Problem Space, Challenges, and Strategies*, Proceedings of the Workshop on Architecting Dependable Systems (WADS), June 2008.
- George Edwards, Chiyoung Seo, Daniel Popescu, Sam Malek, and Nenad Medvidovic, *Self-* Software Architectures and Component Middleware in Pervasive Environments*, Proceedings of the 5th International Workshop on Middleware for Pervasive and Ad-Hoc Computing (MPAC), November 2007.
- Chiyoung Seo, Sam Malek, George Edwards, Daniel Popescu, Nenad Medvidovic, Brad Petrus, and Sharmila Ravula, *Exploring the Role of Software Architecture in Fault-Tolerant and Dynamic Pervasive Systems*, Proceedings of the 1st Workshop on Software Engineering of Pervasive Computing Applications, Systems and Environments (SEPCASE), May 2007.

BOOK CHAPTERS

- Ivo Krka, George Edwards, Leslie Cheung, Leana Golubchik, and Nenad Medvidovic, *A Comprehensive Exploration of Challenges in Architecture-Based Reliability Estimation*, submitted to Architecting Dependable Systems 6, 2009.

POSTERS, PRESENTATIONS, AND DEMONSTRATIONS

- George Edwards, *Model-Driven Analysis Frameworks for Embedded Systems*, USC Center for Software and Systems Engineering Annual Research Review, March 2009.
- George Edwards, *BlueStar Mobile Management Services*, IBM Research Technology Fair, June 2008.
- George Edwards, *Creating Domain-Specific Development Infrastructures*, USC Center for Software and Systems Engineering Annual Research Review, March 2008.
- George Edwards, *Weighing Architectural Trade-offs with XTEAM*, USC Center for Software and Systems Engineering Annual Research Review, February 2007.
- George Edwards, *The Extensible Tool-chain for Evaluation of Architectural Models*, USC Center for Software and Systems Engineering Convocation, October 2006.
- George Edwards, *A Model-Driven Framework for Architectural Evaluation of Mobile Software Systems*, UCI Institute for Software Research Forum, April 2006.

TECHNICAL REPORTS

- George Edwards and Nenad Medvidovic, *Model Interpreter Frameworks*, Technical Report USC-CSSE-2009-514, USC Center for Software and Systems Engineering, University of Southern California, July 2009.
- George Edwards and Nenad Medvidovic, *A Highly Extensible Simulation Framework for Domain-Specific Architectures*, Technical Report USC-CSSE-2009-511, USC Center for Software and Systems Engineering, University of Southern California, May 2009.
- Yuriy Brun, George Edwards, and Nenad Medvidovic, *Injecting Robustness into Autonomic Grid Systems*, Technical Report USC-CSSE-2009-510, USC Center for Software and Systems Engineering, University of Southern California, May 2009.

HONORS AND AWARDS

- **2008 USC Computer Science Outstanding Student Research Award**
Awarded each year for exceptional research achievement by a graduate student in computer science.
- **Annenberg Graduate Fellowship**, Aug 2007
Supports highly qualified graduate students to conduct cutting-edge communication and digital media research and advance important new programs in the communications arena.
- **USC Viterbi School of Engineering Dean's Doctoral Fellowship**, May 2004
Supports world-class students for four years in the pursuit and publication of research leading to the doctoral degree.
- **Vanderbilt *Summa Cum Laude* graduate**, Aug 2003
Awarded to graduates whose grade point average equals or exceeds that of the top 5 percent of the previous year's graduating seniors.
- **NSF Research Experiences for Undergraduates Grant**, June 2003
Supports active research participation by undergraduate students in any of the areas of research funded by the National Science Foundation.

- **Vanderbilt Dean's List with High Honors**, Dec 2000, May 2001, Dec 2001, May 2002, Dec 2002, May 2003
Recognizes outstanding academic performance in a semester. Students are named to the Dean's List when they earn a grade point average of at least 3.500.
- **Vanderbilt School of Engineering Merit Scholarship**, May 2000
Awarded to approximately 5 percent of all applicants based on exceptional accomplishment and high promise in intellectual endeavors.
- **National Merit Scholar**, May 2000
Awarded for academic achievement to 8,200 high school students each year out of 1.5 million entrants.

TEACHING

- Guest Lecturer, CS 589 – Software Engineering for Embedded Systems, Fall 2007, Fall 2008.
- Guest Lecturer, CS 377 – Introduction to Software Engineering, Fall 2007, Fall 2008.
- Guest Lecturer, SAE 599 – Model-Driven Systems Architecture, Summer 2007, Spring 2008.
- Teaching Assistant, CS 589 – Software Engineering for Embedded Systems, Fall 2006.

OTHER PROFESSIONAL EXPERIENCE

- **Network Technician**, CTC Networks, Nashville, TN, Oct 2002 – Mar 2003
Administered Windows-based small business networks and performed network and PC upgrades, troubleshooting, and repair.
- **e-Business Consultant**, Nebraska e-Commerce Association, May 2001 – Aug 2001
Advised small businesses on the development and implementation of strategies for pursuing e-commerce opportunities; acted as technical advisor to the company president.
- **Web Developer**, Nebraska Educational Telecommunications, May 1998 – Aug 2000
Wrote extensive HTML and JavaScript and created original images for CLASS, a Web-delivered, fully accredited high school; developed customized software for secure grade assessment for CLASS.

SERVICE ACTIVITIES

- External Reviewer for the 24th IEEE/ACM International Conference on Automated Software Engineering, Auckland, New Zealand, November 16 - 20, 2009.
- External Reviewer for DSN 2009 Workshop on Architecting Dependable Systems (DSN WADS), Lisbon, Portugal, June 29, 2009.
- External Reviewer for Architecting Dependable Systems 6, Springer Publishing, 2009.
- External Reviewer for the 6th IEEE International Conference on Autonomic Computing (ICAC), June 15 - 19, 2009.
- Reviewer for IEEE Software Special Issue: Domain-Specific Languages & Modeling, July/August, 2009.
- External Reviewer for the 23rd International Conference on Automated Software Engineering (ASE), L'Aquila, Italy, Sept. 15 - 19, 2008.
- External Reviewer for the Working IEEE/IFIP Conference on Software Architecture (WICSA), Vancouver, Canada, February 18 – 21, 2008.
- Program Committee Member for the ISR Graduate Student Research Symposium (GSRS), Irvine, CA, June 1, 2007.
- External Reviewer for the Third International Conference on the Quality of Software Architectures (QoSA), Boston, MA, July 12 - 13, 2007.
- External Reviewer for the 10th International ACM SIGSOFT Symposium on Component-Based Software Engineering (CBSE), Boston, MA, July 9 - 11, 2007.
- External Reviewer for the First IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO), Boston, MA, July 9 - 11, 2007.
- External Reviewer for the Second Workshop on SHARing and Reusing architectural Knowledge - Architecture, rationale, and Design Intent (SHARK/ADI), Minneapolis, MN, May 19 - 20, 2007.

- External Reviewer the Workshop on Tools, Operating Systems and Programming Models for Developing Reliable Systems (TOPMoDeLS), Long Beach, CA, March 26 - 30, 2007.

TECHNICAL EXPERTISE

- **Software modeling:** UML, AADL, MDA, MDE, DSLs, Eclipse EMF/GEF/GMF
- **Programming:** Java, C/C++, Eclipse, Visual Studio, GCC
- **Middleware:** Java EE, CORBA, SOSCOWE, OSGi
- **Service-oriented architectures:** web services, XML, SOAP
- **Mobile software and systems:** Windows Mobile, Java ME
- **Web technologies:** HTML, CSS, HTTP, JavaScript, AJAX, Flash/Flex/ActionScript
- **Software engineering:** OOD/OOP, AOP, design patterns, agile development