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EDUCATION

University of Alabama at Birmingham — Birmingham, AL
Ph.D. in Computer Science — December 2011

Zhengzhou University — Zhengzhou, China
B.S. in Computer Science GPA: 3.9/4.0 — May 2007

PUBLICATIONS

Refereed Journals

1. **Yu Sun**, Jeff Gray, and Jules White, "A Demonstration-based Model Transformation Approach to Automate Model Scalability," *Journal of Software and Systems Modeling,* DOI: 10.1007/s10270-013-0374-0, 2013 (accepted for publication)
2. **Yu Sun**, Jeff Gray, Romain Delamare, and Benoit Baudry, "Automating the Management of Non-functional System Properties using Demonstration-based Model Transformation," *Journal of Software: Evolution and Process*, DOI: 10.1002/smr.1606, 2013 (accepted for publication)
3. Zekai Demirezen, **Yu Sun**, Jeff Gray, and Frédéric Jouault, "Enabling Tool Reuse and Interoperability through Model-Driven Engineering," *Journal of Computational Methods in Science and Engineering (JCMSE)*, vol. 10, no. 2, September 2010, pp. 187-202.

Book Chapters

4. **Yu Sun**, Jeff Gray, Gerti Kappel, Philip Langer, Manuel Wimmer, and Jules White, "A WYSIWYG Approach to Support Layout Configuration in Model Evolutions," *Emerging Technologies for the Evolution and Maintenance of Software Models*, edited by Jörg Rech and Christian Bunse, Idea Group, ISBN: 978-1-61350-438-32012, 2012, Chapter 4, pp. 92-120.
5. **Yu Sun**, Jules White, Jeff Gray, and Aniruddha Gokhale, "Model-Driven Automated Error Recovery in Cloud Computing," *Model-driven Analysis and Software Development: Architectures and Functions*, edited by Janis Osis and Erika Asnina, Idea Group, ISBN: 978-161692-874-2, 2011, Chapter 7, pp. 136-155.

Refereed Conference Papers

6. **Yu Sun** and Jeff Gray, "Model Transformation By Demonstration Debugger: End-User Support for Debugging Model Transformation Execution", *European Conference on Modeling Foundations and Applications (ECMFA)*, Springer-Verlag LNCS 7949, Montpellier, France, July 2013, pp. 86-100. (23% Acceptance Rate)

7. **Yu Sun**, Jeff Gray, Karlheinz Bulheller, and Nicolaus Von Baillou, "A Model-Driven Approach to Support Engineering Changes in Industrial Robotics Software", *International Conference on Model Driven Engineering Languages and Systems (MoDELS),* Springer-Verlag LNCS 7590, Innsbruck, Austria, October 2012, pp. 368-382. (23% Acceptance Rate)
8. Xianjun Sam Zheng, Stefan Christov, **Yu Sun**, and Xiping Song, "UWoN (User Workflow Notation): A Visualization Tool for User Workflow Analysis and Modeling for Developing Healthcare IT," *International Symposium on Human Factors and Ergonomics in Health Care: Bridging the Gap*, Baltimore, MD, March 2012.
9. **Yu Sun**, Jeff Gray, Christoph Wienands, Michael Golm, and Jules White, "A Demonstration-based Approach to Support Live Transformations in a Model Editor," *International Conference on Model Transformation (ICMT)*, Springer-Verlag LNCS 6707, Zurich, Switzerland, June 2011, pp. 213-227. (21% Acceptance Rate)
10. Ferosh Jacob, **Yu Sun**, Jeff Gray, and Puri Bangalore, "A Platform-Independent Tool for Modeling Parallel Programs," *ACM Southeast Conference*, Kennesaw, GA, March 2011, pp. 138-143.
11. **Yu Sun**, Christoph Wienands, and Meik Felser, "Applying Model-Driven Design and Development to Distributed Time-Triggered Systems," *International Conference on Engineering and Meta-Engineering (ICEME)*, Orlando, FL, March 2011.
12. **Yu Sun**, Jules White, and Jeff Gray, "Model Transformation by Demonstration," *International Conference on Model Driven Engineering Languages and Systems (MoDELS)*, Springer-Verlag LNCS 5795, Denver, CO, October 2009, pp. 712-726. (18% Acceptance Rate)
13. Zekai Demirezen, **Yu Sun**, Jeff Gray, and Frederic Jouault, "Supporting Tool Reuse with Model Transformation," *International Conference on Software and Data Engineering (SEDE)*, Las Vegas, NV, June 2009, pp. 119-125.
14. **Yu Sun**, Zekai Demirezen, Frédéric Jouault, Robert Tairas, and Jeff Gray, "Tool Interoperability through Model Transformations," *International Conference on Software Language Engineering (SLE)*, Springer-Verlag LNCS 5452, Toulouse, France, September 2008, pp. 178-187.
15. Ritu Arora, **Yu Sun**, Zekai Demirezen, and Jeff Gray, "Profiler Instrumentation Using Metaprogramming Techniques," *ACM Southeast Conference*, Auburn, AL, March 2008.

Refereed Workshop Papers

16. Hyun Cho, Jeff Gray, and **Yu Sun**, "Quality-Aware Academic Research Tool Development," *International Workshop on Software Quality and Management (SQAM)*, held at the Asia-Pacific Software Engineering Conference (APSEC), Hong Kong, December 2012.
17. **Yu Sun**, Hyun Cho, Jeff Gray, and Jules White, "Assisting Feature Model Configuration Knowledge Reuse using Demonstration-based Model Transformation," *Workshop on Product Line Approaches in Software Engineering (PLEASE)*, held at ICSE 2011, Honolulu, HI, May 2011.
18. Hyun Cho, **Yu Sun**, Jules White, and Jeff Gray, "Key Challenges for Modeling Language Creation By Demonstration," *Workshop on Flexible Modeling Tools*, held at ICSE 2011, Honolulu, HI, May 2011.
19. **Yu Sun**, Jeff Gray, Philip Langer, Manuel Wimmer, and Jules White, "A WYSIWYG Approach for Configuring Model Layout using Model Transformations," *10th Workshop on Domain-Specific Modeling (DSM)*, held at SPLASH 2010, Reno, NV, October 2010.

20. **Yu Sun**, Jeff Gray, and Jules White, "MT-Scribe: A Flexible Tool to Support Model Evolution," *Workshop on Flexible Modeling Tools (FlexiTools)*, held at SPLASH 2010, Reno, NV, October 2010.

21. **Yu Sun**, Zekai Demirezen, Marjan Mernik, Jeff Gray, and Barrett Bryant, "Is My DSL a Modeling or Programming Language?" *Workshop on Domain-Specific ProgramDevelopment (DSPD),* held at *International Conference on Generative Programming and Component Engineering (GPCE)*, Nashville, TN, October 2008.

22. **Yu Sun**, Zekai Demirezen, Tomaz Lukman, Marjan Mernik, and Jeff Gray, "Model Transformations Require Formal Semantics," *Workshop on Domain-Specific Program Development (DSPD),* held at *International Conference on Generative Programming and Component Engineering (GPCE)*, Nashville, TN, October 2008.

Doctoral Symposia

23. **Yu Sun**, "Model Transformation by Demonstration," *Doctoral Symposium, International Conference on Object-Oriented Programming, Systems, Languages and Applications (OOPSLA)*, Orlando, FL, October 2009.

24. **Yu Sun**, "Model Transformation by Demonstration," *Doctoral Symposium, International Conference on Model Driven Engineering Languages and Systems (MoDELS)*, Denver, CO, October 2009.

Tool Demonstrations

25. **Yu Sun**, Jeff Gray, and Jules White, "MT-Scribe: An End-User Approach to Automate Software Model Evolution," *Tool Demonstration, International Conference on Software Engineering (ICSE)*, Honolulu, HI, May 2011.

26. **Yu Sun**, Jules White, and Jeff Gray, "MT-Scribe: A Tool for Recording and Inferring Model Transformations," *Tool Demonstration, International Conference on Object-Oriented Programming, Systems, Languages and Applications (OOPSLA)*, Orlando, FL, October 2009.

Posters

27. **Yu Sun**, "An End-User Demonstration Approach to Support Aspect-Oriented Modeling," *Student Research Competition, International Conference on Software Engineering (ICSE)*, Honolulu, HI, May 2011. (Top 5 Finalist in ACM SIGSOFT Student Research Competition, 2011)

28. **Yu Sun**, "Model Scalability Using a Model Recording and Inference Engine," *Students Research Competition, International Conference on Object-Oriented Programming, Systems, Languages and Applications (SPLASH/OOPSLA)*, Reno, NV, October 2010.

29. **Yu Sun**, "Supporting Model Evolution through Demonstration-based Model Transformation," *Students Research Competition, International Conference on Object-Oriented Programming, Systems, Languages and Applications (OOPSLA)*, Orlando, FL, October 2009. (Top 5 Finalist in ACM SIGPLAN Student Research Competition, 2009)

Ph.D. Dissertation

30. **Yu Sun**, "Model Transformation By Demonstration: An End-User Centric Approach to Support Model Evolution," *Ph.D. Dissertation*, Department of Computer and Information Sciences, the University of Alabama at Birmingham, Birmingham, AL, December 2011.

Abstracts

31. **Yu Sun**, Jeff Gray, Barrett Bryant, "Supporting Aspect-Oriented Modeling through a Demonstration-based Model Transformation Approach," *88th Annual Meeting of the Alabama Academy of Science*, Jacksonville, AL, March 2011. (Best Student Paper Award)
32. **Yu Sun**, "An End-User Demonstration Approach to Support Aspect-Oriented Modeling," *UAB Graduate Student Research Days*, Birmingham, AL, February 2010.
33. **Yu Sun**, "A Demonstration-based Model Transformation Approach to Support Model Scalability," *UAB Graduate Student Research Days*, Birmingham, AL, February 2010.
34. **Yu Sun**, "Demonstration-based Inference of Model Transformations," *ACM Mid-Southeast Conference*, Gatlinburg, TN, November 2009.
35. **Yu Sun**, "Model Transformation by Demonstration," *UAB Graduate Student Research Days*, Birmingham, AL, February 2009.
36. **Yu Sun**, "Homogenizing Tool-specific Formats using Model Transformations," *UAB Graduate Student Research Days*, Birmingham, AL, February 2008.

EXPERIENCES

PAR Works Inc. Nashville, TN
Director of Engineering November 2012 – Present

- **Lead the technical development team for next-generation Augmented Reality (AR) technology**

  Manage the technical development team to support the back-end web services and front-end mobile app development, as well as the continuous improvement on augmented reality algorithms.

- **Support business development to conduct tech demos and trainings**

  Conduct online and on-site demos to customers covering different areas, including high-tech, retail, construction, and digital marking companies.

  Provide product and technology training sessions to clients.

- **Coordinate the collaboration with university research groups**

  Work actively with the co-founders' research groups at UIUC, Virginia Tech and Vanderbilt University to improve the computer vision algorithms and conduct research prototypes for new products.

Amazon.com Seattle, WA
Amazon Web Services (AWS) December 2011 – November 2011
Amazon Silk & Kindle Fire

Software Development Engineer

- **Development and maintenance of the cloud-powered web browser for Kindle Fire**

  Developed and maintained various back-end transportation services to support the Silk mobile web browser for Kindle Fire and Kindle Fire HD, using all AWS services.

  Designed and implemented the data pipeline to periodically analyze usage data and metrics using Hadoop, in order to support some of the innovative services for the customers such as trending pages, page recommendations and automatic transformation optimization.

Amazon.com Seattle, WA
Amazon Web Services (AWS) June 2011 – August 2011
CloudFront & Route 53

Software Development Engineer Intern

- **Route 53 Customer Information Search Web Service**

  Designed and implemented a web-based search service that enables the internal AWS Route 53 team to search and retrieve customer information and the associated hosted zone information based on a given input field.

  The realization of the search process involves interacting and extending different Amazon web services and APIs.

- **Daas Check POP Availability – Next Generation**

  Designed and implemented a black box monitor to check AWS Route 53 DNS service availability.

  Deployed the monitor to different VPS (Virtual Private Server) using AWS EC2 and Linode, in order to reduce false positive test results by performing tests not just from multiple geographic locations, but from independently operated networks.

  A centralized test result aggregator was implemented to automatically collect results from VPS, give alarms, and cut remedy tickets to assist the system maintenance work of the team.

Siemens Corporate Research Princeton, NJ
Department of Software & Systems Engineering Technologies March 2010 – August 2010
System Architecture & Platforms Group

Research Intern

- **A Model-Driven Engineering Approach to Support Automobile Software Systems**

  A domain-specific modeling language was built to model the data communication system with diverse protocols (e.g., FlexRay, CAN) used in automobiles.

  A full code generator was implemented to enable users to model the high-level architecture of the hardware configuration and functional communication, with the final implementation code for different platforms being completely generated from the models.

  The result of the project has been published in ICEME 2011 as a conference paper.

- **Modeling and Analysis of Functional Controller in Embedded Systems**

  Designed and implemented a domain-specific modeling language to model the internal logics of functional controllers used in embedded systems.

  Low-level implementation code for the controller can be generated automatically from models through a code generator.

  A plugin was implemented to analyze and estimate the worst-case execution time (WCET).

  Part of the project combined with the application of my PhD research topic has been published in ICMT 2011 as a conference paper.

- **UWoN: A Visualization Tool for User Workflow Analysis and Modeling**

  Participated in the initial design of a new notation to specify user workflow.

  Contributed to the implementation of the visualization tool for the new notation using domain-specific modeling techniques.

  The result of the project has been published in HFES 2012 as a conference paper.

University of Alabama Tuscaloosa, AL
Department of Computer Science September 2010 – May 2011

Visiting Scholar

- **AutoMax: A Model-Driven Approach to Support Robotics Development**

  Collaborated with an automobile consulting company to design an innovative model-based approach to support robotics development for general automobile industry.

  Independently implemented the tool using domain-specific modeling techniques to enable modeling the welding robot actions and configurations, full code generation, robot action optimization, and timing analysis.

  Closely worked with the customer to collect feedback, improve functionality and user experiences, and conduct demos.

  This project was a finalist for the 2011 Alabama Launchpad startup competition.

University of Alabama at Birmingham Birmingham, AL
Department of Computer and Information Sciences August 2007 – present

Research Assistant on NSF CAREER Grant

- **Model Transformation By Demonstration (MTBD)**

  Created an innovative demonstration-based approach to implement model transformation tasks without using programming languages or knowing metamodel definitions.

  Implemented a complete tool support for MTBD as a plugin to the Eclipse modeling tool – GEMS (Generic Eclipse Modeling System). This work was supported by NSF CAREER Award - CCF-1052616.

  The result of the project has been published and demonstrated at MODELS, OOPSLA, and ICSE.

- **A Model-Driven Approach to Visual Representation for Code Clone Detection Tools**

  Realized a uniform visual representation for different code clone detection tools using a model-driven engineering approach.

  Different analysis results provided by different code clone detection tools are parsed and injected into models, followed by being transformed to a generic Code Clone DSL model, and then into an SVG model. Finally, the SVG code can be automatically extracted from SVG models.

  The result of the project has been published in SLE 2009 as a conference paper.

AWARDS AND HONORS

Competition Awards

- **Consumer Electronic Show** (CES) Innovation Award for PAR Works (2013)
- Technical Achievement Top 5 Finalist at **SXSW** for PAR Works (2013)
- Accelerator Award Top 3 Finalist at **SXSW** for PAR Works (2013)
- US People's Choice Award, Software Design Competition, **Microsoft Imagine Cup** (2009)
  Project: PDADoctor
- US Top 15 Finalist, Software Design Competition, **Microsoft Imagine Cup** (2009)
  Project: PDADoctor
- Finalist in **Alabama Launchpad** (2011)
  Project: Automax
  Collaborated with Bulheller Consulting Inc. and University of Alabama
- Best Student Paper Award in **88th Annual Meeting of the Alabama Academy of Science** (2011)
  Paper: Supporting Aspect-Oriented Modeling through a Demonstration-based Model Transformation Approach
- Top 5 Finalist in **ACM SIGSOFT Student Research Competition** (2011)
  International Conference on Software Engineering (ICSE)
  Project: An End-User Demonstration Approach to Support Aspect-Oriented Modeling
- Top 5 Finalist in **ACM SIGPLAN Student Research Competition** (2009)
  International Conference on Object-Oriented Programming, Systems, Languages and Applications (OOPSLA)
  Project: Supporting Model Evolution Through Demonstration-based Model Transformation
- 3rd place in **ACM Mid-Southeast Conference Student Paper Competition** (2009)
  Paper: Demonstration-based Inference of Model Transformations
- 3rd place in **ACM Southeast USA Regional Programming Contest** (2007)
  With team members: Yu Chang and Walker Haddock
- 3rd place in **BearingPoint Annual Intercollegiate Programming Competition** (2008)
  With team members: Yu Chang and Walker Haddock

Graduate Awards

- Passed Ph.D. Level 1 Qualifying Exam "With Distinction" (2009)
- 2nd place in the Mathematics and Computer and Information Sciences session at the UAB Graduate Student Research Days (2008)

Travel Grants

- From ACM SIGSOFT CAPS to attend ICSE (2011)
- From ACM SIGSOFT to attend ICSE Student Research Competition (2011)
- From Alabama Academy of Science (AAS) to attend 88th Annual AAS Meeting (2011)
- From ACM SIGPLAN to attend SPLASH/OOPSLA Student Research Competition (2010)
- From ACM SIGSOFT CAPS to attend MODELS (2009)
- From ACM SIGPLAN to attend OOPSLA Student Research Competition (2009)
- From UAB GSA to attend OOPSLA (2009, 2008)

Undergraduate Awards

- Ranking 1st in Computer Science Major Award (2007)
- Excellent Student Scholarship (2003 – 2007)
- Honor Student (2004 – 2007)
- Excellent Student Leader Award (2004- 2007)

INVITED TALKS

- Amazon Silk brown bag seminar, Seattle, WA, "Introduction to Model-Driven Engineering", August, 2012
- Siemens Corporate Research, Princeton, NJ, "A Practical Perspective on Domain-Specific Modeling - The Good, the Bad, and the Cautious," September, 2011
- Tsinghua University, Beijing, China, "Domain-Specific Modeling and Model Transformation By Demonstration," May, 2011

PROFESSIONAL ACTIVITIES

Reviewer

- IEEE *IEEE Software (2013)*
- IEEE *Proceedings of the IEEE (2013)*
- SoSyM *Software and Systems Modeling Journal (2011, 2010)*
- JSS *Journal of Systems and Software (2011)*
- MODELS *International Conference on Model Driven Engineering Languages and Systems (2012, 2011, 2010, 2009)*
- ICSOC *International Conference on Service Oriented Computing (2009)*
- TOOLS *International Conference on Objects, Models, Components, and Patterns (2011, 2010, 2009)*
- DSL *IFIP Working Conference on Domain Specific Languages (2009)*
- OOPSLA *International Conference on Object-oriented Programming, System, Languages, and Applications (2011, 2008)*
- Onward! *Onward at SPLASH (2010)*
- ICSC *International Conference on Software Composition (2010)*
- GPCE *International Conference on Generative Programming and Component Engineering (2010)*
- ECMDA *European Conference on Model-Driven Architecture (2008)*
- AOSD *International Conference on Aspect-oriented Software Development (2010, 2009, 2008)*
- SLE *International Conference on Software Language Engineering (2013, 2010, 2008)*
- ACM-SE *ACM Southeast Conference (2008)*
- BOOK *Model-driven Analysis and Software Development: Architectures and Functions (2009)*
- BOOK *Emerging Technologies for the Evolution and Maintenance of Software Models (2011)*

Service

- OOPSLA *Student Volunteer, International Conference on Object-Oriented Programming, Systems, Languages, and Applications (2010, 2009, 2008)*
- GSA *Senator, Graduate Student Association, University of Alabama at Birmingham (2009 – present)*

Conferences / Meetings Attended

- ECMFA *European Conference on Modeling Foundations and Applications (2013)*
- ECOOP *European Conference on Object-Oriented Programming (2013)*
- AWE *Augmented World Expo (2013)*
- SXSW *South by Southwest (2013)*
- *CES Consumer Electronics Show (2013)*
- ICSE *International Conference on Software Engineering (2011)*
- MODELS *International Conference on Model Driven Engineering Languages and Systems (2009)*
- GPCE *International Conference on Generative Programming and Component Engineering (2009, 2008)*
- OOPSLA *International Conference on Object-oriented Programming, System, Languages, and Applications (2010, 2009, 2008)*
- FSE *International Symposium on the Foundations of Software Engineering (2010)*
- SLE *International Conference on Software Engineering Language (2009)*
- DSPD *International Workshop on Domain-Specific Program Development (2008)*
- DSM *International Workshop on Domain-Specific Modeling (2010, 2009, 2008)*
- AAS *Alabama Academy of Science Annual Meeting (2011)*
- ACM-MSE *ACM Mid-Southeast Conference (2009)*
- ACM-SE *ACM Southeast Conference (2008)*

TEACHING EXPERIENCES

Teaching Assistant

- CS501/401 Programming Languages (Spring 2010)
- CS620/720 Advanced Topics on Software Engineering (Spring 2009)
- CS622/722 Advanced Topics on Reflective and Adaptive Systems (Fall 2008)
- CS303 Algorithms and Data Structures (Spring 2008)
- CS201 Introduction to Object-Orient Programming (Spring 2008)
- CS410/510 Database Systems I (Fall 2007)
- CS435/535 Network Programming (Fall 2007)
- CS101 Fluency With Information Technology (Fall 2007)

EDUCATION OUTREACH

- **Alabama Robotics Competition**
  (April 2, 2011)
  Position: Competition Judge
- **Blazer BEST Robotics Competition**
  (October 11, 2008)
  Position: Website Judge, Scorekeeper
- **UAB High School Programming Competition**
  (2008, 2009, 2010)

Position: Grader, Event coordinator

- **Alice Film Festival**
  (2008, 2009)
  Position: Event coordinator

GRADUATE SUPPORT

- My graduate work is sponsored by the National Science Foundation (NSF), CAREER, "Foundational Principles to Support Evolution in Domain-Specific Modeling."

CERTIFICATE

- Sun Certified Web Component Developer (SCWCD, score: 97%) — October 2010
- Sun Certified Java Developer (SCJD) — August 2010
- Sun Certified Java Programmer (SCJP, score: 98%) — December 2006
- National Software Engineer Certificate — June 2006
  Issued by Ministry of Industry and Information Technology of China
- National Programmer Certificate — June 2005
  Issued by Ministry of Industry and Information Technology of China

TELEVISION / NEWSPAPER INTERVIEWS

- "PAR Works Enhances $25,000 Developer Competition to Encourage Innovative Ideas," Yahoo Finance, January 8, 2013.
- "UAB Students Invent 'PDA Doctor'," FOX 6, Birmingham, AL, April 26, 2009, 9pm Evening News.
- "University of Alabama at Birmingham Team Created Diagnostic Software for Handheld Computers to Aid Doctors," Birmingham News, April 22, 2009
- "UAB Wins the People's Choice Award at Microsoft's Imagine Cup," UAB News, June 8, 2009

REFERENCES

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