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Education

Technische Universität München, Munich, Germany, October 1996 to July 2000
  Ph.D. Computer Science (2000)
  Dissertation: *Distributed Systems Design with Message Sequence Charts*
  Advisor: Manfred Broy

University of Texas at Austin, September 1995 to September 1996
  M.A. Computer Sciences (1996)

Technische Universität München, 1991 to July 1995
  Undergraduate & graduate studies in Computer Science, prediploma (1993)

Professional Experience

University of California, San Diego
  Associate Professor, Computer Science and Engineering, July 2008 to Present
  Director, Bernard and Sophia Gordon Engineering Leadership Center, March 2009 to Present
  Assistant Professor in Residence, Computer Science and Engineering, July 2002 to June 2008
  Functional Area Manager for the Software & Systems Architecture & Integration Team
    (SAINT), California Institute for Telecommunications and Information Technology,
    September 2004 to Present
  Assistant Research Scientist, California Institute for Telecommunications and Information
    Technology, October 2001 to June 2002

University of Paderborn, Paderborn, Germany
  Visiting Researcher, July to August 2006

Technische Universität München, Munich, Germany
  Post-Doctoral Researcher/Asst. Researcher, Software and Systems Engineering
    (Professor Manfred Broy), December 2000 to October 2001

Validas Model Validation AG, Munich, Germany
  Consultant and Trainer, June 2000 to October 2001

Technische Universität München, Munich, Germany
  Research Assistant & Teaching Assistant, October 1996 to October 2000
  Teaching Assistant, October 1993 to October 1995

BMW AG, Munich, Germany
  Intern, July 1991 to May 1992

Markt & Technik Verlag AG, Munich, Germany
  Author, January 1986 to June 1990

Research Interests

Software and systems engineering for service-, component-, and object-oriented systems, real-time and embedded systems, distributed system design, software and systems architecture, ultra large scale systems, programming methodology, programming languages and modeling notations, program semantics and verification, compiler construction, computer networks, automata theory

Publications

REFEREED JOURNAL ARTICLES

J10. I. H. Krüger, M. Meisinger, and M. Menarini, "Interaction-based Runtime Verification for Systems of Systems Integration," Journal of Logic and Computation, Nov. 2008. (Advanced Access Published)

J09. M. Broy, I. H. Krüger, A. Pretschner, and C. Salzmann, "Engineering Automotive Software," Proceedings of the IEEE, vol. 95, no. 2, pp. 356-373, Feb. 2007.

J08. M. Broy, I. H. Krüger, and M. Meisinger, "A Formal Model of Services," ACM Transactions on Software Engineering and Methodology (TOSEM), vol. 16, no. 1, Jan. 2007.

J07. J. Whittle, J. Chakraborty, and I. Krüger, "Systematically Developing State-based Test Models from Scenarios: An Example from the Telecommunications Domain," Software Quality Professional Journal, vol. 8, no. 4, Sep. 2006.

J06. F. Doucet, M. Menarini, I.H. Krüger, R. Gupta, and J.-P. Talpin, "A Verification Approach for GALS Integration of Synchronous Components," Electronic Notes in Theoretical Computer Science, vol. 146, no. 2, pp. 105-131, Jan. 2006.

J05. I. Krüger, W. Prenninger, and R. Sandner, "Broadcast MSCs," Formal Aspects of Computing, vol. 16, no. 3, pp. 194-209, 2004.

J04. I. H. Krüger, "Specifying Services with UML and UML-RT: Foundation, Challenges and Limitations," VISS 2002, Validation and Implementation of Scenario-based Specifications (Satellite Event of ETAPS 2002), B. Caillaud and A. Muscholl (Eds.), Electronic Notes in Theoretical Computer Science, vol. 65, no. 4, pp. 1-17, Elsevier B.V., Apr. 2002.

J03. I. Krüger, H, W. Prenninger, R. Sandner, and M. Broy, "From Scenarios to Hierarchical Broadcasting Software Architectures using UML-RT," International Journal of Software Engineering and Knowledge Engineering, vol. 12, no. 2, pp. 155-174, 2002.

J02. M. Broy, R. Breu, F. Huber, I. Krüger, B. Rumpe, and W. Schwerin, "Methodik, Sprachen und Grundlagen des Software Engineering (Abschlußbericht des Forschungslabors Syslab 10/94-9/99)," Informatik - Forschung und Entwicklung, vol. 16, no. 1, pp. 53-59, Feb. 2001. (in German)

J01. R. Breu, R. Grosu, C. Hofmann, F. Huber, I. Krüger, B. Rumpe, M. Schmidt, and W. Schwerin, "Exemplary and Complete Object Interaction Descriptions," Computer Standards & Interfaces, vol. 19, no. 7, pp. 335-345, 1998.

BOOKS AND BOOK CHAPTERS

B06. A. Bouguettaya, I. Krüger, and T. Margaria (Eds.), Service-Oriented Computing - ICSOC 2008, Lecture Notes in Computer Science, vol. 5364/2008. Springer Berlin / Heidelberg, Nov. 2008.

B05. M. Broy, I. H. Krüger, and M. Meisinger (Eds.), Model-Driven Development of Reliable Automotive Services: Second Automotive Software Workshop, ASWSD 2006, San Diego, CA, USA, March 15-17, 2006, Revised Selected Papers, Lecture Notes in Computer Science, vol. 4922. Springer Berlin/Heidelberg, 2008.

B04. M. Broy, I. H. Krüger, and M. Meisinger (Eds.), Automotive Software - Connected Services in Mobile Networks: First Automotive Software Workshop, ASWSD 2004, San Diego, CA, USA, January 10-12, 2004, Revised Selected Papers, Lecture Notes in Computer Science, vol. 4147. Springer Berlin/Heidelberg, 2006.

B03. I. Krüger, W. Prenninger, R. Sandner, and M. Broy, "Development of Hierarchical Broadcasting Software Architectures Using UML 2.0," Integration of Software Specification Techniques for Applications in Engineering. Priority Program SoftSpez of the German Research Foundation (DFG). Final Report, H. Ehrig, W. Damm, J. Desel, M. Große-Rhode, W. Reif, E. Schnieder, and E. Westkämper (Eds.), Lecture Notes in Computer Science, vol. 3147, pp. 29-47, Springer Berlin / Heidelberg, 2004.

B02. I. Krüger, "Amiga. Programmieren mit Modula-2." Markt&Technik Verlag, 1988 (in German)

B01. I. Krüger, R. Arbinger, "Amiga Scriptum". Markt&Technik Verlag, 1989 (in German)

REFEREED CONFERENCE AND WORKSHOP PROCEEDINGS

C49. A. Chave, M. Arrott, C. Farcas, E. Farcas, I. Krueger, M. Meisinger, J. Orcutt, F. Vernon, C. Peach, O. Schofield, and J. Kleinert, "Cyberinfrastructure for the US Ocean Observatories Initiative: Enabling Interactive Observation in the Ocean," in IEEE OCEANS'09 Bremen, Germany. IEEE Ocean Engineering Society, May 2009, p. 10. (paper 090125-018)

C48. B. Demchak, V. Ermagan, E. Farcas, T.-J. Huang, I. Krüger, and M. Menarini, "A Rich Services Approach to CoCoME," The Common Component Modeling Example: Comparing Software Component Models, A. Rausch, R. Reussner, R. Mirandola, and F. Plasil (Eds.), Lecture Notes in Computer Science, no. 5153, ch. 5, pp. 85-115, Berlin/Heidelberg: Springer-Verlag, Aug. 2008.

C47. V. Ermagan, I. H. Krüger, and M. Menarini, "A Fault Tolerance Approach for Enterprise Applications," in Proceedings of the IEEE International Conference on Services Computing (SCC), July 2008.

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C44. B. Demchak, V. Ermagan, C. Farcas, E. Farcas, I. H. Krüger, and M. Menarini, "Rich Services: Addressing Challenges of Ultra-Large-Scale Software-Intensive Systems," in Proceedings of the ICSE 2nd International Workshop on Ultra-Large-Scale Software-Intensive Systems (ULSSIS 2008), Leipzig, Germany. IEEE, May 2008.

C43. F. Doucet, R. K. Shyamasundar, I. H. Krüger, S. Joshi, R. K. Gupta,"Reactivity in SystemC Transaction-Level Models," in Karen Yorav (Ed.): Hardware and Software: Verification and Testing, Third International Haifa Verification Conference, HVC 2007, Haifa, Israel, October 23-25, 2007, Lecture Notes in Computer Science 4899, Springer, 2008.

C42. V. Ermagan and I. H. Krüger, "A UML2 Profile for Service Modeling," in Proceedings of the ACM/IEEE 10th International Conference on Model Driven Engineering Languages and Systems (MODELS), Nashville, TN. Springer-Verlag, Oct. 2007.

C41. B. Demchak, C. Farcas, E. Farcas, and I. H. Krüger, "The Treasure Map for Rich Services," in Proceedings of the 2007 IEEE International Conference on Information Reuse and Integration (IRI), Las Vegas, USA. IEEE, Aug. 2007.

C40. M. Arrott, B. Demchak, V. Ermagan, C. Farcas, E. Farcas, I. H. Krüger, and M. Menarini, "Rich Services: The Integration Piece of the SOA Puzzle," in Proceedings of the IEEE International Conference on Web Services (ICWS), Salt Lake City, Utah, USA. Jul. 2007.

C39. V. Ermagan, C. Farcas, E. Farcas, I. H. Krüger, and M. Menarini, "A Service-Oriented Blueprint for COTS Integration: the Hidden Part of the Iceberg," in Proceedings of the ICSE 2007 workshop on Incorporating COTS Software into Software Systems: Tools and Techniques (IWICSS), Minneapolis. IEEE, May 2007.

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C33. I. H. Krüger, R. Mathew, and M. Meisinger, "Efficient exploration of service-oriented architectures using aspects," in Proceedings of the 28th international conference on Software engineering (ICSE '06), Shanghai, China. New York, NY: ACM Press, May 2006, pp. 62-71.

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C31. J. Ahluwalia, I. H. Krüger, M. Meisinger, and W. Phillips, "Model-Based Run-Time Monitoring of End-to-End Deadlines," in Proceedings of the 5th ACM international conference on Embedded Software (EMSOFT'05), Jersey City, NJ, USA. ACM Press, Sep. 2005, pp. 100-109.

C30. J. Whittle, J. Chakraborty, and I. Krüger, "Generating Simulation and Test Models from Scenarios," in Proceedings of the 3rd World Congress for Software Quality, vol. 2, Munich, Germany. International Software Quality Institute GmbH, Sep. 2005, pp. 43-53. (Best Paper Award)

C29. I. H. Krüger, R. Mathew, and M. Meisinger, "From Scenarios to Aspects: Exploring Product Lines," in Proceedings of the ICSE 2005 Workshop on Scenarios and State Machines (SCESM'05), St. Louis, Missouri. New York, NY, USA: ACM Press, May 2005, pp. 1-6.

C28. R. A. McClure and I. H. Krüger, "SQL DOM: compile time checking of dynamic SQL statements," in Proceedings of the 27th international conference on Software Engineering (ICSE'05), St. Louis, MO, USA. New York, NY, USA: ACM Press, May 2005, pp. 88-96.

C27. M. Deubler, I. Krüger, M. Meisinger, and S. Rittmann, "Modeling Crosscutting Services with UML Sequence Diagrams," Model Driven Engineering Languages and Systems, 8th International Conference, MoDELS 2005, Montego Bay, Jamaica, October 2-7, 2005. Proceedings, L. Briand and C. Williams (Eds.), Lecture Notes in Computer Science, vol. 3713, pp. 522-536, Springer Berlin / Heidelberg, 2005.

C26. I. H. Krüger, "Service-Oriented Software and Systems Engineering - A Vision for the Automotive Domain," in Proceedings of the 3rd International Conference on Formal Methods and Models for Co-Design, 2005. MEMOCODE '05, Verona, Italy. 2005, p. 150. (panel statement)

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C21. I. H. Krüger and R. Mathew, "Systematic Development and Exploration of Service-Oriented Software Architectures," in In Proceedings of the 4th Working IEEE/IFIP Conference on Software Architecture (WICSA-4), Oslo, Norway. IEEE/IFIP, 2004.

C20. I. H. Krüger, E. C. Nelson, and K. V. Prasad, "Service-Based Software Development for Automotive Applications," in Proceedings of the CONVERGENCE 2004. Convergence Transportation Electronics Association, 2004.

C19. J. Whittle and I. H. Krüger, "A Methodology for Scenario-Based Requirements Capture," in Proceedings of the ICSE 2004 Workshop on Scenarios and State Machines (SCESM). 2004.

C18. R. Cornea, S. Mohapatra, N. Dutt, R. Gupta, I. Krueger, A. Nicolau, D. Schmidt, S. Shukla, and N. Venkatasubramanian, "A Model-Based Approach to System Specification for Distributed Real-time and Embedded Systems," in Proceedings of RTAS 2003 Workshop on Model-Driven Embedded Systems, Washington, DC, USA. May 2003.

C17. A. Egyed, M. Glinz, I. Krüger, T. Systä, S. Uchitel, and A. Zündorf, "Second workshop on Scenarios and State Machines: models, algorithms, and tools," in Proceedings of the 25th International Conference on Software Engineering, Portland, Oregon. Washington, DC, USA: IEEE Computer Society, May 2003, pp. 783-784. (workshop summary)

C16. R. Cornea, N. Dutt, R. Gupta, I. Krueger, A. Nicolau, D. Schmidt, and S. Shukla, "FORGE: A Framework for Optimization of Distributed Embedded Systems Software," in Proceedings of the International Parallel and Distributed Processing Symposium (IPDPS'03) , Nice, France. IEEE Computer Society, Apr. 2003.

C15. I. Krüger, "Modeling and Synthesis with MSC Extensions for Broadcasting, Overlapping, Preemptive, and Triggered Collaborations," in Proceedings of ICSE 2003 Workshop on Scenarios and State Machines (SCESM). 2003.

C14. I. Krüger, "Capturing Overlapping, Triggered, and Preemptive Collaborations Using MSCs," Fundamental Approaches to Software Engineering: 6th International Conference, FASE 2003, Held as Part of the Joint European Conferences on Theory and Practice of Software, ETAPS 2003, Warsaw, Poland, April 7-11, 2003, Proceedings, M. Pezzè (Ed.),

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C12. I. H. Krüger, "Towards Precise Service Specification with UML and UML-RT, in: Critical Systems Development with UML and UML-RT," in Proceedings of the Workshop on Critical Systems Development with UML (CSDUML), J. Jürjens, M. V. Cengarle, E. B. Fernandez, B. Rumpe, and R. Sandner (Eds.). Technische Universität München Institut für Informatik, 2002, pp. 19-34.

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C08. I. Krüger, "Notational and Methodical Issues in Forward Engineering with MSCs," Proceedings of OOPSLA 2000 Workshop: Scenario-based round-trip engineering, T. Systä (Ed.), Reportno. 20, Tampere University of Technology, Software Systems Laboratory, Oct. 2000.

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C04. I. Krüger, R. Grosu, P. Scholz, and M. Broy, "From MSCs to Statecharts," in Proceedings of the IFIP WG10.3/WG10.5 international workshop on Distributed and Parallel Embedded Systems (DIPES'98), F. J. Rammig (Ed.), Scholoß Eringerfeld, Germany. Kluwer Academic Publishers, 1999, pp. 61-71.

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M30. A. Chave, M. Arrott, M. Meisinger, J. Orcutt, I. Krueger, F. Vernon, J. Kleinert, O. Schofield, and C. Peach, "Toward a Cyberinfrastructure for the Ocean Observatories Initiative: Enabling Interactive Observation Within the Oceans." AGU Conference, Dec. 2008. (poster)

M29. C. Farcas, P. Fox, M. Arrott, E. Farcas, I. Klacansky, I. Krueger, M. Meisinger, and J. Orcutt, "OOI CyberInfrastructure - Next Generation Oceanographic Research." AGU Conference, Dec. 2008. (poster)

M28. M. Meisinger, M. Arrott, A. Clemesha, C. Farcas, E. Farcas, T. Im, O. Schofield, I. Krueger, I. Klacansky, J. Orcutt, C. Peach, A. Chave, D. Raymer, and F. Vernon, "Integrating Data Distribution and Data Assimilation Between the OOI CI and the NOAA DIF." AGU Conference, Dec. 2008. (poster)

M27. C. Farcas, T.-J. Huang, S. Payne, N. Bandeira, A. Frank, N. Gupta, P. Pevzner, I. Krueger, and V. Bafna, "Rapid Cyberinfrastructure Evolution for Proteomics Research." 56th ASMS Conference on Mass Spectrometry and Allied Topics, Jun. 2008. (poster)

M26. B. Demchak and I. H. Krüger, "Composable Chat: Towards a SOA-based Enterprise Chat System," Tech. Rep. CS2008-0918, University of California, San Diego, Apr. 2008

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M20. I. Krüger: "Component Synthesis from Service Specifications". In F. Bordeleau, S. Leue, T. Systä, Dagstuhl Seminar Nº 03371 "Scenarios: Models, Transformations and Tools", 2003

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M05. M. Broy, M. von der Beeck, and I. Krüger, "SOFTBED: Problemanalyse für ein Großverbundprojekt "Systemtechnik Automobil -- Software für eingebettete Systeme"," report drafted for the BMBF, BMBF, 1998. (in German)

M04. R. Breu, R. Grosu, C. Hofmann, F. Huber, I. Krüger, B. Rumpe, M. Schmidt, and W. Schwerin, "Exemplary and Complete Object Interaction Descriptions," Proceedings OOPSLA'97 Workshop on Object-oriented Behavioral Semantics, H. Kilov, B. Rumpe, and I. Simmonds (Eds.), Technische Universität München, 1997.

M03. M. Broy, C. Hofmann, I. Krüger, and M. Schmidt, "A Graphical Description Technique for Communication in Software Architectures," Tech. Rep. TUM-I9705, Technische Universität München, 1997.

M02. I. Krüger, "An experiment in compiler design for a concurrent object-based programming language," Master's thesis, UT Austin, 1996.

M01. I. Krüger: "Modula-2", Amiga-Magazin, 4/88—11/88 (eight issues), Markt&Technik-Verlag, 1988 [ARTICLE SERIES IN GERMAN COMPUTER MAGAZINE]

PANELS

- I. Krüger, "Steps Towards Failure Management for Automotive Software Services." In "The One Ton Mobile Platform: Where is it Taking Us?", Pavillion Panel at DAC 2007

- I. Krüger, "Service-Oriented Software and Systems Engineering- A Vision for the Automotive Domain." MEMOCODE 2005, Panel Presentation, 2005.

- I. Krüger, "Service-Oriented Software and Systems Engineering." In Challenges and New Opportunities for Service-Oriented Architecture (SOA) Adoption in Large-Scale Software Development Projects, Panel at WICSA 2004

COLLOQUIA

- I. Krüger, "Ein Ansatz zur Zuverlässigkeitsprüfung Komplexer Fahrzeugdienste," Colloquium at TU Braunschweig, February 17, 2009

- I. Krüger, "Fail-Safety Checking for Interactive Services," Colloquium at UT Austin, April 21, 2008

- I. Krüger, "Systems of Systems Integration with Rich Services," Colloquium at UCSD, April 09, 2008

- I. Krüger, "Systems of Systems Integration with Rich Services," Colloquium at UT Austin, March 06, 2008

- I. Krüger, "Systematic Systems of Systems Integration with Rich Services," Colloquium at NCSU, February 27, 2008

- I. Krüger, "Ein Systematischer Entwicklungsansatz für Dienstorientierte Integrationsarchitekturen," RWTH Aachen, January 30, 2008

- I. Krüger, "Ein Systematischer Entwicklungsansatz für Dienstorientierte Integrationsarchitekturen," CAU Kiel, November 15, 2007

- I. H. Krüger, "Service-Oriented Software and Systems Engineering – A Vision for the Automotive Domain." University of Kaiserslautern, 2006

- I. H. Krüger, "Service-Oriented Software and Systems Engineering – A Vision for the Automotive Domain." University of Paderborn, 2006

- I. H. Krüger, "Service-Oriented Software and Systems Engineering – A Vision for the Automotive Domain." University of Salzburg, 2005

- I. Krüger, "Service-Oriented Software and Systems Engineering." In Multi-University Research Laboratory Presentation at Microsoft Research, 2003

- I. Krüger: "Distributed System Design with Message Sequence Charts". University of Texas, Austin, TX USA, 2000

OTHER PRESENTATIONS

- I. Krüger, "Systematic Systems of Systems Integration with Rich Services," Lockheed Martin Engineers Week, February 18, 2008

- B. Demchak, V. Ermagan, E. Farcas, T.-J. Huang, I. Krüger, and M. Menarini, "A Rich Services Approach to CoCoME," The Common Component Modeling Example: Comparing Software Component Models. GI-Dagstuhl Research Seminar, Dagstuhl Castle, Germany, Aug. 2007.

- I. H. Krüger, V. Ermagan, M. Menarini, "The Distributed Car— Motivating a Comprehensive Service-Oriented Engineering Approach for Cyber-Physical Systems,

Position Paper at National Workshop on Beyond SCADA: Networked Embedded Control for Cyber Physical Systems (HCSS-NEC4CPS), Pittsburgh, USA, 2006.

- I. H. Krüger, V. Ermagan, M. Menarini, "High-Confidence Service Engineering for Cyber-Physical Systems," Position Paper at National Workshop on High-Confidence Software Platforms for Cyber-Physical Systems (HCSP-CPS), Virginia, USA, 2006.

- I. H. Krüger, V. Ermagan, M. Menarini, "Model-based failure management for distributed reactive systems." Monterey Workshop Series, 2006

- I. H. Krüger, R. Malani, M. Meisinger, M. Menarini, "Applying Service-Oriented Development to Complex Systems: a BART Case Study." Monterey Workshop Series, 2005

- I. Krüger, R. Malani, M. Menarini, R. Gupta, Y. Agarwal, F. Doucet, D. Palmer, D. Kimball, "RUNES/UCSD Project Meeting," 2005

- I. Krüger, "Service Modeling: The Key to Complexity Management for Distributed And Reactive Systems." Presentation at the NSF Science of Design: Software Intensive Systems Workshop, 2004.

- I. Krüger, "Engineering Automotive Software Services: Complexity Management for Critical Systems." In M. Broy, R. Ernst, U. Goltz, L. Lavagno, Dagstuhl Seminar No 03461, "Software Intensive Embedded Systems- with Special Emphasis on Automotive," 2003

Professional Activities

Member of the Editorial Board

- Journal on Software & Systems Modeling, Springer

- Co-Guest Editor of Special Issue of the Proceedings of the IEEE on Aerospace and Automotive Software

- Guest Editor for Journal of Visual Languages & Computing, Volume 17, Issue 6, December 2006, Elsevier

- Journal on Software & System Modeling, Associate Editor for Special Section on Service-Based Software Engineering, 2006

- IEEE Transactions on Software Engineering, Associate Editor for Special Issue on Scenarios and State Machines, 2005

Conference (Co-)Organization:

- ICSE 2010 (OC Member, Co-Chairing Software Engineering in Practice Track)
- RSP 2009 (PC Co-Chair)
- ICSE 2008 (OC Member, Co-Chairing Automotive Systems Track)
- ICSOC 2008 (PC Co-Chair)
- MEMOCODE 2004 (Local Arrangements Chair)

Workshop (Co-)Organization:

- Symposium on Automotive/Avionics Systems Engineering (SAASE) 2009
- Automotive Software Workshop San Diego (ASWSD) 2006, Advanced Automotive Software and Systems Development: Model-Driven Development of Reliable Automotive Services, 2006
- ASWSD 2004, Future Generation Automotive Software Architectures. Connected Services in Mobile Networks, 2004
- Workshop on Visual Modeling for Software Intensive Systems (VMSIS), 2005
- Service-Based Software Engineering 2003 (SBSE, Workshop at Formal Methods 2003)
- Scenarios and State Machines 2004 (SCESM, Workshop at ICSE 2004)
- SCESM 2003 (Workshop at ICSE 2003)
- SCESM 2002 (Workshop at ICSE 2002)

Program Committee Member

- ICSE 2010
- ICSE 2009 Industrial Track
- RTAS 2009
- MODELS 2009
- RSP 2009
- SEAA 2008 - SAPS
- RTAS 2008
- ECMDA 2008
- FSE 2008 Workshops
- National Workshop on High-Confidence Automotive Cyber-Physical Systems, 2008
- Workshop on Advanced Mechatronic Systems, Paderborn, 2008
- International Conference on Service Oriented Computing (ICSOC) 2007, area coordinator for Service Modeling
- 4th Workshop on Object-Oriented Modeling of Embedded Real-time Systems (OMER4), 2007
- SCESM 2007
- SCESM 2006
- Workshop on Multi-Paradigm Modeling MPM 2006 (Workshop at the Models 2006 Conference)
- VMSIS 2005
- SCESM 2005
- SCESM 2004
- Modellierung 2004
- Software Engineering for Automotive Systems (SEAS) 2004
- International Workshop on Automotive Requirements Engineering (AuRE) 2004
- Critical Systems Development with the UML (CSDUML) 2003
- SBSE 2003
- SCESM 2003
- SCESM 2002
- VISS 2002

Other Professional Activities

- Referee for Journals, Conferences, Workshops (among others)
  - Journal of Systems and Software
  - Journal Methods of Information in Medicine
  - IBM Systems Journal
  - IEEE Transactions on Software Engineering
  - ACM Transactions on Software Engineering and Methodology
  - Acta Informatica
  - Journal on Software and Systems Modeling
  - Automated Software Engineering Journal
  - Journal of Theoretical Computer Science
  - Formal Methods Europe (FME) 1997
  - Automated Software Engineering (Demonstrations Track) 2005
  - VMSIS 2005
  - SBSE 2003
  - SCESM 2002 – 2007
  - VISS 2002
  - MFCS 2001 & 2000
  - AMAST 2000
  - PDSE '97

- NSF Reviewer for Sol Greenspan, Helen Gill

Courses Designed and Taught at UCSD

Title	Level	Designed	Terms
Software Engineering	Under-graduate		SP'09, F'08, SP'07
Adv. Software Engineering – Software Architectures for Distributed Reactive Systems	Graduate	✓	W'09, W'08, W'07, W'06, W'05, W'04, W'03
Software Reliability Methods	Graduate	✓	SP'06, SP'05, SP'04
Fundamental Issues in Software Architectures	Graduate	✓	SP'02
Service Composition for Ultra-Large Scale Systems	Graduate	✓	SP'08
Software and Systems Engineering Seminar	Graduate/ Under-graduate	✓	SP'08, W'08, F'07, SP'07, W'07, F'06, SP'06, W'06, F'05, SP'05, W'05, F'04
Principles of Software Engineering (w/Bill Griswold)	Graduate		SP'05

Title	Level	Designed	Terms
JSOE AESE Program: Agile & Plan-Driven Development; Domain Modeling; Ontologies; Enterprise Service Bus; Service-Oriented Software Architectures; Design Patterns; Enterprise Patterns	Graduate	✓	F'08-SP'09, F'07-SP'08, SP'06-F'06

Students Supervised and Mentored

Postdoctoral Researcher Advisor

- Emilia Farcas, ongoing
- Claudiu Farcas, ongoing

Ph.D. Advisor

- Barry Demchak, ongoing
- Fred Doucet (Co-Advisor: Rajesh Gupta), ongoing
- To-Ju Huang, ongoing
- Massimiliano Menarini, ongoing
- Filippo Seracini, ongoing

Ph.D. Committee Member

- Robert Boyer (graduated 2005, Advisor: Bill Griswold)
- McNeil Shonle (Advisor: Bill Griswold)
- Ryo Sugihara (Research Exam Committee Member)

Masters Advisor

- Tyler Netherland: Rich Services in Erlang, Master's Thesis, University of California, San Diego, 2009 (ongoing)

- Hamidreza Hamidtoolloei: Identity Managament, Master's Thesis, University of California, San Diego, 2008

- Ernesto Morales-Perea: MSCCheck: Compositional Verification with MSCs, Master's Thesis, University of California, San Diego, 2008

- Yenny Rusli: Methodological Translation of Service-Oriented to Component-Oriented Specification. Master's Thesis, University of California, San Diego, 2006

- Walter Phillips: A modular architecture for rapid development of model-based real-time systems. Master's Thesis, University of California, San Diego, 2006

- Kiran Kalyan: Design and Analysis of a Secure Enterprise Messaging Solution, Master's Thesis, University of California, San Diego, 2006

- Praveen Moorthy: Building a Tool for Synthesis of Correct Design from Interaction Specifications, Master's Thesis, University of California, San Diego, 2006

- Russell McClure: SQL DOM: Strongly Typed Dynamic SQL Statements, Master's Thesis, University of California, San Diego, 2005

- Jaswinder Ahluwalia: A Code-Generation Approach to Runtime Monitoring of End-to-End Real-Time Constraints. Master's Thesis, University of California, San Diego, 2005

- Reena Mathew: Architectural Description Languages for Services, Master's Thesis, University of California, San Diego, 2004

- Eric Lin: Software Sensors: Design and Implementation of a Programming Model and Middleware for Sensor Networks, Master's Thesis, University of California, San Diego, 2004

- Yunfeng Fei: Speech Controlled Service Invocation Framework, Master's Thesis, University of California, San Diego, 2003

- Ankur Jain: Towards Automated Signal Strength Measurement, Master's Thesis, University of California, San Diego, 2003

- Leonid Kof: Formal Service-Engineering for Embedded Systems using a Seat Controller as an Example, Diploma Thesis, Technische Universität München, 2001 (in German)

- Markus Lanzl: Design and Development of an Interface Layer for an Expert System, Diploma Thesis, Technische Universität München, 1999

- Andreas Voigt: Design and Implementation of a Tool for Pattern-Oriented Software-Design, Diploma Thesis, Technische Universität München, 1997 (in German)

Masters Committee Member

- Divya Kumar: Developing Principles for Designing User-Interfaces for Illiterate Communities, Master's Thesis, University of California, San Diego, 2008 (Advisor: Bill Griswold)

- Vitaliy Zavesov: Application of Algebraic Semiotics to the Design and Analysis of Graphical User Interfaces, Master's Thesis, University of California, San Diego, 2006 (Advisor: Yannis Papakonstantinou)

- Jonathan Neddenriep: RiverInk – A Framework for Multimodal Interoperable Ink, Master's Thesis, University of California, San Diego, 2005 (Advisor: William Griswold)

- Abigail Gray: Purrnet, Master's Thesis, University of California, San Diego, 2005 (Advisor: Joseph Goguen)

- Alexis O'Connor: A Refactoring Tool for the UCSD Star Diagram plug-in for Eclipse, Master's Thesis, University of California, San Diego, 2005 (ongoing, Advisor: William Griswold)

Faculty Mentor in the UCSD STARS Program

- Krystle D. Lemon: Integrating Security Aspects into an Architecture Definition Language. Research Paper in the STARS Program, University of California, San Diego, 2004

Faculty Advisor in the Calit2 Summer Scholars Program

- Gunny Lee (2005)

Faculty Mentor in the UCSD Faculty Mentor Program

- Jennifer Lee: From Collaboration to Component Behavior: An Analysis of Synthesis Algorithms. Research Paper in the Faculty Mentor Program, University of California, San Diego, 2003

- Weilin Chou: Service-Oriented Reverse Engineering from Execution Traces of Electronic Control Units, Research Paper in the Faculty Mentor Program, University of California, San Diego, 2005

Faculty Advisor in the AMYRC program (2003—2004)

Faculty Advisor for the UCSD Society of Automotive Engineers 2004

Software Architectures, Software Systems and Tools Built

- **Ocean Observatories Initiative (OOI) CyberInfrastructure (CI)**: The OOI will provide scientists for the first time an infrastructure to conduct interactive experiments in some of the ocean's most extreme environments. This interactive capability will be enabled by the OOI CI, which links and binds the physical infrastructure into a cloud-computing and -storage enabled scientific network that can be accessed by any scientist. The CI will provide a wide range of tools that will enable research by providing the scientist the ability to interact with environmental sensors in real-time, acquire/visualize/analyze the data collected by the network, and plan complex experiments.

- **Proteomics - Computational Mass Spectrometry**: Service-based integration architecture and infrastructure to unify access to multiple mass spectrometry tools; rapid requirements elicitation, architecture design and production system implementation. http://proteomics.ucsd.edu/LiveSearch/

- Ocean Research Collaborative Networks (**ORION**) Cyberinfrastructure **Conceptual Architecture**: a blueprint for next-generation oceanographic observation systems. http://www.orionprogram.org/organization/committees/ciarch/default.html

- **Research.Intelligence**: a Calit2 portal, meant to be a "living" experiment of how data mining, visualization, and Web 2.0 technologies can be used to support the research endeavor. The site is broken into four major sections: **Grant funding** (New solicitations from the federal government and "maps" of funding opportunities;) **Industrial partners** (Breaking news and profiles of Calit2 industrial partners;)

Research interests (The research strengths of Calit2 affiliated researchers;) **Dashboard** (Monthly updated baseline metrics data on Calit2 performance and overview slides.) http://researchintel.net

- **BioNet** Software and Systems Architecture: BioNet was a cooperative program between the Department of Homeland Security (DHS) and the Defense Threat Reduction Agency (DTRA). The BioNet architecture served as a blueprint for integrating and enhancing currently disparate military and civilian detection and characterization capabilities. http://bionet.calit2.net/

- **RESCUE** Enterprise Service Bus (**ESB**): an integration infrastructure for diverse subsystems in the RESCUE project, supporting flexible and lightweight access to and combination of diverse, distributed data sources and applications, based on scalable, plugin-enabled ESB-technologies, such as Mule and ActiveMQ.

- **M2Code**: A tool for (a) modeling interaction aspects of complex distributed reactive systems, and (b) synthesis of state machines whose behavior conforms to the specified interaction aspects. Developed as a Microsoft Visio plugin.

- **RTCORBA Code Generator**: A tool for (a) transforming the statemachines generated by M2Code into RTCORBA executables, and (b) monitoring adherence to real-time constraints at runtime

- **MSC-Check**: An Eclipse-based tool for verifying (a) the consistency of an interaction interface specification, and (b) the correctness of an implementation wrt. The interaction interface using model-checking techniques.

- **M2Aspects**: An AspectJ-based tool for (a) converting M2Code models into AspectJ programs, and (b) architecture exploration exploiting the AspectJ weaving capability to map the same interaction specification to different target architectures.

- **SeussCpp:** A compiler translating composite Seuss and C++ programs into C++ code, executable in a distributed, heterogeneous computing environment on top of the PVM middleware.

Departmental and University Activities

UCSD Jacobs School of Engineering

- Director, Bernard and Sophia Gordon Engineering Leadership Center, March 2009 – Present

UCSD CSE Department

- Vice Chair for Industrial Relations, Fall 2008 – Present
- Ad-hoc Committee Member
- Member of the Ph.D. Admission Committee, 2009/08
- Member of the Master's Admission Committee, 2008/07, 2007/06, 2006/05, 2005/04

UCSD Division of the California Institute for Telecommunications and Information Technology

- Member of the Calit2 UCSD Divisional Council
- Member of the Calit2 UCSD Divisional Subcommittee on New Research Initiatives
- Member of the Calit2 UCSD Divisional Subcommittee on Academic Personnel

UCSD Extension

- Member of the Consulting Committee for the Software Engineering Program
- Member of the Consulting Committee for the New Product Development Program

Grants, Contracts, & Gifts

- MRI: Development of Instrumentation for Project GreenLight, NSF, $2,000,000, 07/15/08 – 07/14/11, Role: **Co-PI**

- Center for Computational Mass-Spectrometry (P41), NIH NCRR, $4,980,341, 03/01/08 – 02/28/13, Role: **Co-PI**

- ASOSA: Automotive Service-Oriented Software & Systems Engineering, NSF, $425,000, 8/15/07 - 7/31/10, Role: **PI**

- Ocean Observatories Initiative Cyberinfrastructure, Joint Oceanographic Institutions (JOI), Inc., $29,000,000, 05/01/07 – 04/30/13, Role: **System Architect** and **Common Operating Infrastructure Subsystem Lead**

- PALMS: A Tool for Geospatial Analysis of Physical Activity, NIH/NCI, $2,587,940, 7/1/07 - 6/30/11, Role: **Co-PI**

- Collaborative Proposal: Center for Software-Intensive Ultra-Large-Scale Systems, NSF, $10,000, 05/01/07 – 04/30/08, Role: **Co-PI**

- Exploring Service-Oriented Architectures for Enterprise Chat, SPAWAR, $25,000, 3/12/07 – 9/28/07, Role: **PI**

- From Organismal Genomics to Environmental Metagenomics Community Cyberinfrastructure for Advanced Marine Microbial Ecology Research and Analysis ("CAMERA"), The Gordon and Betty Moore Foundation, $24,500,000, 12/15/05 - 11/30/12, Role: **Co-PI**

- Failure Management in Service-Oriented Automotive Software, UC Discovery with Toyota InfoTechnology Center USA, $172,870, 04/24/06 - 04/24/07, Role: **PI**

- Advanced Automotive Software and Systems Development – Tackling complexity with models, processes and structured architectures – UC Discovery Dig05-306 Opportunity Award, $15,000, Role: **PI**

- Workshop: Future Generation Software Architectures in the Automotive Domain - Connected Services in Mobile Networks -1/10-1/12/04, San Diego, CA, NSF, $24,361.00, 02/01/04 – 07/31/06, Role: **PI**

- University Research Program (URP): Development of a Software Framework and Toolset for the Modeling and Specification of Vehicle Systems with Portable Consumer Electronics Systems, Ford Research and Advanced Engineering, Dearborn, MI, USA, $120,000, 05/16/03 – 05/15/06, Role: **PI**
  Note: Was leveraged to obtain UCDiscovery funding (see the following two entries)

- Software Service Design for Automotive Infotronics, UCDiscovery, with Ford Research and Advanced Engineering, Dearborn, MI, USA $70,244 02/10/04 – 07/09/05, Role: **PI**

- Software Service Design for Automotive Infotronics (Competitive Renewal) UCDiscovery, with Ford Research and Advanced Engineering, Dearborn, MI, US $69,034, 02/08/05 – 02/07/06, Role: **PI**

- Service-Oriented Automotive Software Architectures, Toyota InfoTechnology Center, Palo Alto, CA, USA, $6,000 GIFT, Role: **PI**

- Advanced Engineering Methods for Networked Automotive Software, UCDiscovery, with Toyota IT Center, Palo Alto, CA, USA $199,999, 02/03/04 – 02/02/06, Role: **PI**

- RUNES/UCSD Contribution, Calit2, $96,000, 04/26/05, Role: **Co-PI**, with Rajesh Gupta (Co-PI)

- Public Safety Initiative, Calit2, $196,000, 04/26/05—04/25/06, Role: **Co-PI,** with Ganz Chockalingam (Co-PI)

- BioNet System Design and Development Support SPAWAR, $1,166,220, 09/27/04 – 09/26/05, Role: **Senior Personnel** (Lead Software Architect), with Ramesh Rao (PI)

Professional Memberships

- Gesellschaft für Informatik (Germany)
- Association for Computing Machinery
- IEEE

Honors & Awards

2009   UCSD Sustainability Award for project "GreenLight"

2009   Corporation for Education Network Initiatives in California (CENIC) Innovations in Networking Awards for project "GreenLight"

2006   Outstanding Faculty Award in the JSOE "Architecture-Based Enterprise Systems Engineering" Graduate Program

2005   Best paper award for: J. Whittle, J. Chakraborty, and I. Krüger, "Generating Simulation and Test Models from Scenarios," in Proceedings of the 3rd World Congress for Software Quality, vol. 2, Munich, Germany. International Software Quality Institute GmbH, Sep. 2005, pp. 43-53.

2002   US Patent No.: 06405361, 2002 "Automatically Generating a Program" (with
            Manfred Broy and Radu Grosu)

2001   Invitation to the "Werner-von-Siemens-Ring" society board member meetings in the
            role of a young investigator for the cycle of 2001-2003

1999   German patent #198 37 871 awarded on a procedure for automatically generating
            programs (with Manfred Broy and Radu Grosu)

1995-1996   Fulbright grant for a one-year stay at the University of Texas at Austin

1995-1996   Travel grant awarded by the Catholic church in Germany

1993-1996   Scholarship awarded by the Catholic church in Germany