

Dr. Douglas Craig Schmidt

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Educational Background

- **Ph.D. Computer Science**, summer 1994, University of California, Irvine
Dissertation: “An Object-Oriented Framework for Experimenting with Alternative Process Architectures for Parallelizing Communication Subsystems.”
Co-advisors: Dr. Tatsuya Suda and Dr. Richard W. Selby.
- **M.S. Computer Science**, summer 1990, University of California, Irvine, specializing in software engineering.
- **M.A. Sociology**, summer 1986, College of William and Mary, Williamsburg, Virginia
Thesis: “A Statistical Analysis of University Resource Allocation Policies.”
Advisor: Dr. Michael A. Faia.
- **B.A. Sociology**, summer 1984, College of William and Mary, Williamsburg, Virginia.

Professional Experience

1. **2/17 – present: Cornelius Vanderbilt Professor of Engineering**
Received an endowed chair in recognition of my scholarship, intellect, and leadership in the field of computer science and computer engineering.
2. **1/03 – present: Full Professor with tenure**
Conducting research on patterns, optimizations, and experimental analysis of advanced generative software techniques that facilitate the development of distributed real-time and embedded middleware and model driven architectures running over high-speed networks and interconnects in the Department of Computer Science at Vanderbilt University.
3. **7/1/22 – Present: Associate Chair of Computer Science**
Provide intellectual leadership within the CS department. Coordinate with CS Chair to assist in CS and CompE curriculum development and course staffing. Assist the faculty in building industry and federal programs for CS. Assist the Chair in mentoring junior CS faculty. Assist the EECS Chair in improving the ranking of the CS programs. Assist the Chair in increasing the quality, number, and online offerings of undergraduate and graduate student applications to the CS programs.
4. **1/12 – present: Visiting Scientist at the Software Engineering Institute (SEI)**
Assist the SEI Director’s Office in formulating the SEI’s technology strategy for R&D projects and external relationships by aligning the expertise of the SEI technical staff to identify and respond to the needs of government sponsors, and partners and help the SEI shape future innovations in complex software-reliant systems.
5. **7/1/18 – 6/30/22: Associate Provost of Research Development and Technologies**
Develop cohesive and sustainable information technology (IT) services to advance research and scholarship across Vanderbilt’s ten schools and colleges; develop scalable storage and processing solutions by leveraging on-campus and cloud data storage services, as well as creating big data research cores and core-related services; and implement NIST 800-171 compliant IT services.
6. **8/1/18 – 6/30/22: Co-Director of the Vanderbilt Data Science Institute**
Facilitate highly innovative research and education initiatives that build on Vanderbilt University’s current strengths, promote new collaborations, and establish a cohesive institutional framework that embraces Vanderbilt’s diverse campus, while establishing the university as a leader in data science research and education.

7. **02/16 – 7/31/18: Associate Chair of Electrical Engineering and Computer Science**
Provide intellectual leadership within the EECS department. Coordinate with EECS Chair to assist in EE, CS, and CompE curriculum development and course staffing. Assist the faculty in building industry and federal programs for EECS. Assist the Chair in mentoring junior EECS faculty. Assist the EECS Chair in improving the ranking of the EECS programs. Assist the Chair in increasing the quality and number of undergraduate and graduate student applications to the EECS programs.
8. **12/04 – 1/16: Associate Chair of Computer Science and Engineering**
Provide intellectual leadership within the CS program. Coordinate with EECS Chair to assist in CS and CompE (CS&E) curriculum development and course staffing. Assist the faculty in building industry and federal programs centered in CS&E and IT for EECS. Assist the Chair in mentoring junior CS&E faculty. Assist the EECS Chair in improving the ranking of the CS&E programs. Assist the Chair in increasing the quality and number of undergraduate and graduate student applications to the CS&E programs.
9. **4/13 – 2/18: Member of the Board of Directors at Real-Time Innovations (RTI).**
Work with the CEO and other members of the Board of Directors of RTI to help assess company technical and business strategy.
10. **7/11 – 7/13: Adjunct Professor of Software Engineering** in the Institute for Software Research in the School of Computer Science at Carnegie Mellon University.
11. **1/1/10 – 12/31/13: Member of the Air Force Scientific Advisory Board**
Worked on several studies related to Cyber-Situational Awareness and Sustaining Aging Aircraft.
12. **9/10 – 12/11: Deputy Director of Research and Chief Technology Officer at the Software Engineering Institute (SEI)**
Lead the formulation of the SEI's technology strategy for R&D projects and external relationships by aligning the expertise of the SEI technical staff to identify and respond to the needs of sponsors, customers, and partners and help the SEI shape future innovations in complex software-reliant systems.
13. **07/05 – 8/10: Visiting Scientist at the Software Engineering Institute**
Assisted Linda Northrop and the Ultra-Large-Scale (ULS) Systems team to define the challenge problems, promising technology areas, and research roadmaps for the national R&D effort on building the software-reliant systems of the future that are likely to have billions of lines of code. This activity is defining a broad, multi-disciplinary research agenda for developing ULS systems of the future.
14. **06/09 – 8/10: Chief Technology Officer for Zircon Computing**
Assisted in the strategic direction of Zircon Computing technology development in the areas of adaptive distributed computing middleware for high-performance and real-time applications. Help to formulate the technology strategy for open-source middleware platforms, R&D partnerships, and external relationships.
15. **6/07 – 8/07: Visiting Professor at Trinity College Dublin**
Worked with Professor Vinny Cahill and the Distributed Systems Group at Trinity College on topics pertaining to service-oriented architectures and autonomic computing.
16. **10/06 – 5/09: Chief Technology Officer for PrismTechnologies**
Assisted in the strategic direction of PrismTechnologies technology development in the areas of open-source middleware platforms and model-driven tools. Help to formulate the technology strategy for open-source middleware platforms and model-driven tools, R&D partnerships, and external relationships.
17. **3/02 – 12/02: Program Manager**
Led the National effort on middleware as a Program Manager for over \$60 million dollars of funding at the DARPA Information Exploitation Office (IXO). Programs include Program Composition for Embedded Systems (PCES) and National Experimentation Platform for Hybrid and Embedded Systems (NEPHEST).
18. **9/01 – 3/02: Deputy Director**
Served as the Deputy Director for the DARPA Information Technology Office (ITO), helping set and guide the National IT research and development agenda and manage programs on autonomous systems, network-centric command and control systems, combat systems, real-time avionics systems,

distributed real-time and embedded systems, and augmented cognition for the U.S. Department of Defense.

19. **6/00 – 3/02: Program Manager**
Led the National effort on middleware as a Program Manager for over \$60 million dollars of funding at the DARPA Information Technology Office (ITO). Programs included the Program Composition for Embedded Systems (PCES).
20. **6/01 – 6/02: Co-chair for the Software Design and Productivity (SDP) Coordinating Group**
The SDP Coordinating Group formulates the multi-agency research agenda in fundamental software design for the Federal government's Networking and Information Technology Research and Development (NITR&D) Program, which is the collaborative IT research effort of the major Federal science and technology agencies.
21. **8/99 – 2002: Associate Professor with tenure**
Conducted research on patterns, implementation, and experimental analysis of object-oriented techniques that facilitate the development of high-performance, distributed real-time and embedded computing systems on parallel processing platforms running over high-speed networks and embedded system interconnects in the Department of Computer Engineering at the University of California, Irvine.
22. **6/99 – 8/99: Associate Professor with tenure**
Conducted research on patterns, implementation, and experimental analysis of object-oriented techniques that facilitate the development of high-performance, distributed real-time and embedded computing systems on parallel processing platforms running over high-speed networks and embedded system interconnects in the Department of Computer Science and the Department of Radiology at Washington University in St. Louis.
23. **6/98 – 6/99: Associate Professor without tenure (early promotion)**
Conducted research on patterns, implementation, and experimental analysis of object-oriented techniques that facilitate the development of high-performance, distributed real-time and embedded computing systems on parallel processing platforms running over high-speed networks and embedded system interconnects in the Department of Computer Science and the Department of Radiology at Washington University in St. Louis.
24. **8/94 – 6/98: Assistant Professor**
Conducted research on object-oriented patterns and techniques for developing highly extensible, high-performance communication frameworks in the Department of Computer Science and the Department of Radiology at Washington University in St. Louis.
25. **3/91 – 8/94: Research Assistant**
Developed object-oriented frameworks for multi-processor-based communication subsystems with Professor Tatsuya Suda at the University of California, Irvine.
26. **6/90 – 11/90: Member of the Technical Staff**
Worked as a software engineer for Independence Technologies, which was one of the largest suppliers of enterprise-level TUXEDO systems, providers of professional services, and developers of management and connectivity software to support OLTP environments.
27. **8/88 – 3/91: Research Assistant**
Devised measurement-guided software development techniques for large-scale software systems with Professor Richard Selby at the University of California, Irvine.
28. **6/88 – 8/88: Research Assistant**
Studied the impact of computing on end-users in forty U.S. city governments with Dr. John King and the URBIS project at the Public Policy Research Organization, University of California, Irvine.
29. **Summer of 87: Technical Intern**
Worked with Dr. Peter G. W. Keen at the International Center for Information Technology, Washington D.C. on various projects, including software productivity, videotex, and smartcards.
30. **9/86 – 5/88: Teaching Assistant**
Developed programming assignments, grading tools, and led recitation sessions for a number of undergraduate Computer Science courses at the University of California, Irvine.

31. **Summer of 86: Statistical Programmer**

Programmed SPSS and SAS applications for the “Justice Delayed” project under the direction of Dr. Gene Flango at the National Center for State Courts, Williamsburg, Virginia.

32. **1/85 – 8/86: Research Assistant**

Examined university resource allocation policies via statistical analysis under the direction of Dr. Michael Faia at the College of William and Mary, Williamsburg, Virginia.

Publications

In Print

- **Refereed Journal Publications**

- J130 Quchen Fu, Zhongwei Teng, Marco Georgaklis, Jules White, and Douglas C. Schmidt, “NL2CMD: An Updated Workflow for Natural Language to Bash Commands Translation,” *The Journal of Machine Learning Theory, Applications and Practice*, Vol. 1, pp 1–38., 2022.
- J129 Peng Zhang, Christopher Fonnesebeck, Douglas C. Schmidt, Jules White, Samantha Kleinberg, Shelagh A. Mulvaney, “Understanding Barriers to Self-Management in Type 1 Diabetes Using Machine Learning and Momentary Assessment,” the *JMIR Journal of mHealth and uHealth*, Vol 10., No 5., March 2022.
- J128 Summer Weber, Elyse Shearer, Shelagh Mulvaney, Douglas C. Schmidt, Chris Thompson, Jessica Jones, Haseeb Ahmad, Martina Coe, and Pam Hull, “Prioritization of Features for Mobile Phone Applications for Families in a Federal Nutrition Program for Low-income Women, Infants, and Children: User-Centered Design Approach,” *JMIR Formative Research*, Vol 5., No 7., July 2021.
- J127 Alex Roehrs, Cristiano A. da Costa, Rodrigo R. Righi, Andre H. Mayer, Valter F. da Silva, Jose R. Goldim, and Douglas C. Schmidt, “Integrating Multiple Blockchains to Support Distributed Personal Health Records,” the *SAGE Health Informatics Journal*, April, 2021.
- J126 Zhongwei Teng, Peng Zhang, Xiao Li, William Nock, Denis Gilmore, Marcelino Rodriguez-Cancio, Jules White, Jonathan C. Nesbitt, Douglas C. Schmidt, “Authentication and Integration Approaches for mHealth Apps from a Usability View,” the journal *Advances in Electrical and Electronic Engineering*, North America, 19, March, 2021.
- J125 Scott Eisele, Aron Laszka, Douglas C. Schmidt, and Abhishek Dubey, “The Role of Blockchains in Multi-Stakeholder Transactive Energy Systems,” the journal *Frontiers in Blockchain: Emerging Technologies and Blockchain in Action: Applications in Supply Chain Management and Energy*, volume 3, December, 2020, pps. 1-55.
- J124 Peng Zhang, Chris Downs, Nguyen Thanh Uyen Le, Cory Martin, Paul Shoemaker, Clay Wittwer, Luke Mills, Liam Kelly, Stuart Lackey, Douglas C. Schmidt, Jules White, “Towards Patient-centered Stewardship of Research Data and Research Participant Recruitment with Blockchain Technology,” the *Frontiers in Blockchain special selection on Non-Financial Blockchain*, 2020, volume 3, pps. 1-32.
- J123 Yao Pan, Fangzhou Sun, Jules White, Douglas C. Schmidt, Jacob Staples, Lee Krause, and Zhongwei Teng, “Detecting Web Attacks with End-to-End Deep Learning,” the Springer *Journal of Internet Services and Applications*, 2019, volume 10, number 16, pps. 1-22.
- J122 Shelagh Mulvaney, Lori Laffel, Korey Hood, Cindy Lybarger, Sarah Vaala, and Douglas C. Schmidt, “A Mobile App Identifies Momentary Psychosocial and Contextual Factors Related to Mealtime Self-Management in Adolescents with Type 1 Diabetes,” *Journal of the American Medical Informatics Association*, Oxford University Press, 2019, Volume 26, Number 12, pps. 1627-1631.
- J121 Maria E. Powell, Marcelino Rodriguez Cancio, David Young, William Nock, Beshoy Abdelmesih, Amy Zeller, Irvin Perez Morales, Peng Zhang, C Gaelyn Garrett, Douglas Schmidt, Jules White, and Alexander Gelbard, “Decoding Phonation with Artificial Intelligence (DEP AI): Proof of Concept,” the *Laryngoscope Investigative Otolaryngology* journal, Wiley-Blackwell, Volume 4, Issue 3, 2019, pps. 328-334.
- J120 Alex Roehrs, Cristiano Andre da Costa, Rodrigo da Rosa Righi, Valter Ferreira da Silva, Jose Roberto Goldim, and Douglas C. Schmidt, “Analyzing the Performance of a Blockchain-based

- Personal Health Record Implementation,” the *Journal of Biomedical Informatics*, Elsevier, volume 92, 2019.
- J119 Peng Zhang, Breck Stodghill, Cory Pitt, Cavan Briody, Douglas C. Schmidt, Jules White, Alan Pitt, and Kelly Aldrich, “OpTrak: Tracking Opioid Prescriptions via Distributed Ledger Technology,” the *International Journal of Information Systems and Social Change (IJISSC)*, Special Issue On: Blockchain Technology: Platforms, Tools, and Use Cases, IGI Global, Volume 10, Number 2, 2019.
- J118 Peng Zhang, Jules White, Douglas C. Schmidt, Gunther Lenz, S. Trent Rosenbloom, “FHIR-Chain: Applying Blockchain to Securely and Scalably Share Clinical Data,” the Elsevier *Computational and Structural Biotechnology Journal – Blockchain and Distributed Ledger Technologies in Biology, Medicine, and eHealth Special Issue*, Volume 16, July 2018, pp 267–278.
- J117 Shelagh A Mulvaney, Sarah Vaala, Korey K Hood, Cindy Lybarger, Rachel Carroll, Laura Williams, Douglas C Schmidt, Kevin Johnson, Mary S Dietrich, and Lori Laffel, “Mobile Momentary Assessment and Bio-Behavioral Feedback for Adolescents with Type 1 Diabetes: Feasibility, Engagement Patterns, and Relation with Blood Glucose Monitoring,” *EMJ Journal of Diabetes Technology and Therapeutics*, Vol 20, No. 7, July 2018, pp 465–474.
- J116 Subhav Pradhan, Abhishek Dubey, Shweta Khare, Saideep Nannapaneni, Aniruddha Gokhale, Sankaran Mahadevan, Douglas C Schmidt, Martin Lehofer, “CHARIOT: A Holistic, Goal Driven Orchestration Solution for Resilient IoT Applications,” the *ACM Transactions on Cyber-Physical Systems*, Vol 2, No. 3, July 2018, pp 1-37.
- J115 Hull PC, Emerson JS, Quirk ME, Canedo JR, Jones JL, Vylegzhanina V, Schmidt D, Mulvaney S, Beech B, Husaini BH, “A Smartphone App for Families With Preschool-Aged Children in a Public Nutrition Program: Prototype Development and Beta-Testing,” *Journal of Medical Internet Research (JMIR): mHealth and uHealth*, Vol 5, No. 8, August, 2017, pp 1–19.
- J114 Yao Pan, Jules White, Douglas C. Schmidt, Ahmed Elhabashy, Logan Sturm, Jaime Camelio, and Christopher Williams, “Taxonomies for Reasoning About Cyber-physical Attacks in IoT-based Manufacturing Systems,” Special Issue on Advances and Applications in the Internet of Things, edited by Vicente Garcia Diaz, *International Journal of Interactive Multimedia and Artificial Intelligence*, volume 4, number 3, 2017, pp. 45-54.
- J113 Gordon Blair, Douglas C. Schmidt, and Chantal Taconet, “Middleware for Internet Distribution in the Context of Cloud Computing and the Internet of Things,” *Springer Journal Annals of Telecommunications*, April 2016, Volume 71, Issue 3, pp. 87-92.
- J112 Yu Sun, Jules White, Sean Eade, and Douglas C. Schmidt, “ROAR: A QoS-Oriented Modeling Framework for Automated Cloud Resource Allocation and Optimization”, the *Journal of Systems and Software*, Elsevier, volume 116, issue C, June 2016 pp. 146.161.
- J111 Nick Guertin, Brian Womble, Paul Bruhns, Douglas C. Schmidt, Adam Porter, and Bill Antypas, “Management Strategies for Software Infrastructure in Large-Scale Cyber-Physical Systems for the US Navy,” *Cutter IT Journal*, Vol. 28, No. 5, May 2015, pp. 14-18.
- J110 Jules White, Josi A. Galindo, Tripti Saxena, Brian Dougherty, David Benavides, Douglas C. Schmidt, “Evolving Feature Model Configurations in Software Product Lines,” *Journal of Systems and Software*, Volume 87, 2014, pp. 119-136.
- J109 Akram Hakiri, Aniruddha S. Gokhale, Pascal Berthou, Douglas C. Schmidt, Thierry Gayraud, Software-Defined Networking: Challenges and Research Opportunities for the Future Internet,” *Journal of Computer Networks*, Volume 75, 2014, pp. 453-471.
- J108 Hamilton Turner, Brian Dougherty, Jules White, Jonathan Preston, Russell Kegley, Douglas C. Schmidt, and Aniruddha Gokhale, “DRE System Performance Optimization with the SMACK Cache Efficiency Metric,” *Elsevier Journal of Systems and Software*, Volume 98, 2014, pp. 25-43.
- J107 Akram Hakiri, Pascal Berthou, Aniruddha Gokhale, Douglas C. Schmidt, Gayraud Thierry, “Supporting SIP-based Data Distribution Service End-to-End QoS in WANs,” the Elsevier *Journal of Systems and Software*, Volume 95, September 2014, pp. 100-121.
- J106 Jules White, Douglas C. Schmidt, and Mani Golparvar-Fard, “Applications of Augmented Reality,” *IEEE Proceedings Special issue on Applications of Augmented Reality*, Vol 102, No. 2., February 2014, pp. 120-123.

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