

Stephen C. Davies

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Education

Ph.D. Computer Science

Dissertation: *The efficacy of personal knowledge bases for materializing mental impressions*

Advisor: Roger King

University of Colorado, Boulder

M.S. Electrical Engineering

Thesis: *Digital signal processing techniques for the automated recognition of musical tones*

Advisor: Delores Etter

University of Colorado, Boulder

B.S. Electrical Engineering (*cum laude*)

Rice University, Houston, Texas

Professional Experience

- 2006–present **University of Mary Washington, Assistant/Associate/Full Professor**, Fredericksburg, Virginia. Teach undergraduate coursework in data science, computer science, and related fields; direct the UMW Data Science minor program; advise students on career and academic-related pursuits; conduct undergraduate-focused research on a broad range of topics, especially including computational social science, agent-based modeling, network data analysis, and natural language processing.
- 2000–2006 **WD30 Corporation, Principal Software Engineer**, Broomfield, Colorado. Performed on-site software consulting and custom software development for clients. Projects included enterprise Web applications, distributed data collection and editing systems, billing and procurement applications, and custom infrastructure components.
- 1999–2000 **Azika Corporation, Principal Software Engineer**, Boulder, Colorado. Developed startup company's flagship product: a web-based marketing automation solution, with both design-time and publish-time elements.
- 1996–1999 **Storage Technology, Inc., (since acquired by Oracle and Sun Microsystems), Staff/Senior Software Engineer**, Louisville, Colorado. Designed and implemented next-generation library management software to drive automated robotic tape libraries.

Publications

Conference proceedings (refereed/peer-reviewed)

1. Davies, Stephen and Harmony Peura (2024). The interaction between heterogeneous voting strategies and dynamic vote-seeking campaigns: an agent-based model. To appear in: *Proceedings of the 2024 Annual Modeling and Simulation Conference (ANNSIM 2024)*. Washington, D.C.
2. Mittereder, Justin, Robert S. W. Carroll, Brandon Frulla, and Stephen Davies (2022). Exploring the impact of social network density and agent openness on societal polarization. *Proceedings of the 2021 Conference of The Computational Social Science Society of the Americas*. Ed. by Zining Yang and Elizabeth von Briesen. Springer Proceedings in Complexity. Cham: Springer International Publishing, pp.71–84. ISBN: 978-3-030-96188-6. DOI: 10.1007/978-3-030-96188-6_6.

3. Venkatachalapathy, Rajesh, Stephen Davies, and William Nehrboss (2019). Wealth dynamics in the presence of network structure and primitive cooperation. *Proceedings of the 2019 International Conference of The Computational Social Science Society of the Americas*. Santa Fe, New Mexico. DOI: 10.1007/978-3-030-77517-9_18.
4. Davies, Stephen (2017). The twin impact of homophily and accessibility on ideological polarization. *Proceedings of the 2017 International Conference of The Computational Social Science Society of the Americas*. Santa Fe, New Mexico. DOI: 10.1145/3145574.3145586.
5. Davies, Stephen and Hannah Zontine (2016). The surprising effect of implementation choices on the rate of convergence of opinion dynamics models. *Presented at the Computational Social Science Society of the Americas 2016 Annual Conference*. Santa Fe, New Mexico.
6. Davies, Stephen and Morgan Brown (2015). Toward an agent-based simulation of the factors impacting diversity within a college student body. *Proceedings of the 2015 Winter Simulation Conference*. Huntington Beach, California, pp.3973–3984. DOI: 10.1109/WSC.2015.7408552.
7. Polack-Wahl, Jennifer, Stephen Davies, and Karen Anewalt (2012). A snapshot of current languages used in industry. *Proceedings of the 42nd ASEE/IEEE Frontiers in Education Conference*. Seattle, Washington. ISBN: 9781467313513. DOI: 10.1109/FIE.2012.6462323.
8. Clemmer, Aaron and Stephen Davies (2011). Smeagol: A “specific-to-general” semantic web query interface paradigm for novices. *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*. Vol. 6860. Part 1. Toulouse, France, pp.288–302. ISBN: 9783642230875. DOI: 10.1007/978-3-642-23088-2_21.
9. Davies, Stephen, Jennifer A. Polack-Wahl, and Karen Anewalt (2011). A snapshot of current practices in teaching the introductory programming sequence. *Proceedings of the 42nd ACM technical symposium on Computer science education*. Dallas, Texas, pp.625–630. ISBN: 9781450305006. DOI: 10.1145/1953163.1953339.
10. Davies, Stephen (2008b). Work in progress - Analyzing the gap between diagrams and code in computer science. *Proceedings of the 38th ASEE/IEEE Frontiers in Education Conference*. Saratoga Springs, New York, pp.16–17. ISBN: 978-1-4244-1969-2. DOI: 10.1109/FIE.2008.4720409.
11. Davies, Stephen, Scotty Allen, and J Raphaelson (2006). Popcorn: the personal knowledge base. *Proceedings of the 6th conference on Designing Interactive systems*. Vol. 1. 303. University Park, Pennsylvania, pp.150–159. DOI: 10.1145/1142405.1142431.
12. Davies, Stephen and Roger King (2005). Crossing the objective-subjective divide in Information Space Organization. *Proceedings of the Eighth Joint Conference on Information Sciences*. Salt Lake City, Utah.
13. Davies, Stephen, Serdar Badem, Michael D. Williams, and Roger King (2004). “Google by reformulation”: Modeling search as successive refinement. *Proceedings of the 2004 IEEE International Conference on Services Computing*. Shanghai, China, pp.435–440. ISBN: 0769522254. DOI: 10.1109/SCC.2004.1358037.
14. Davies, Stephen and Roger King (2004). Leveraging metadata inductively and subjectively. *Proceedings of the Fourth International Conference on Dublin Core and Metadata Applications*. Shanghai, China, pp.163–167.

Journal articles (refereed/peer-reviewed)

1. Crawford, Michael, Stephen Davies, and Alan Griffith (2015). Predicting metapopulation responses of a tidal wetland annual to environmental stochasticity and water dispersal through an individual-based model. In: *Ecological Modelling* **316**(1), 217–229. ISSN: 03043800. DOI: 10.1016/j.ecolmodel.2015.08.019.
2. Davies, Stephen, Stacey Aylor Seal, and Jesse Hatfield (2012). Cinefile: A category-based analytic browser. In: *IEEE Computer*. ISSN: 00189162. DOI: 10.1109/MC.2012.39.
3. Davies, Stephen (2011). Still building the memex. In: *Communications of the ACM* **54**(2), 80. ISSN: 00010782. DOI: 10.1145/1897816.1897840.
4. Davies, Stephen (2009). Appointing team leads for student software development projects. In: *Journal of Computing Sciences in Colleges* **25**(2), 92–99. ISSN: 1937-4771.

Research presentations and posters (refereed/peer-reviewed)

1. Davies, Stephen (June 2024). Modeling political campaigns as a two-mode network with heterogeneous voting strategies and dynamic vote-seeking candidates. (Peer-reviewed presentation). *International Network for Social Network Analysis (INSNA) 2024 Sunbelt Conference (INSNA '24)*. Edinburgh, Scotland, UK.

2. Davies, Stephen and Justin Mittereder (July 2023). An agent-based model of political polarization without party influence or centralized messaging. (Peer-reviewed research poster). *2023 International Conference on Computational Social Science (IC2S2 '23)*. Copenhagen, Denmark.
3. Cagle, Veronica, Stephen Davies, and Thomas Davies (July 2022). "More polarized than ever?" Evidence from social media. (Peer-reviewed research poster). *2022 International Conference on Computational Social Science (IC2S2 '22)*. Chicago, IL, USA.
4. Ruud, Russell and Stephen Davies (July 2014). Modeling decentralized price fluctuations through agent-based recognition of scarcity (Peer-reviewed presentation). *Presented at the 89th Annual Conference of the Western Economic Association International (WEIA)*. Denver, Colorado.
5. Crawford, Michael, Stephen Davies, and Alan Griffith (Dec. 2013). Estimating the effects of heterogeneous competition in an agent-based ecological model using GIS raster color. (Peer-reviewed research poster). *Proceedings of the 2013 Winter Simulation Conference: Simulation: Making Decisions in a Complex World*. Washington, D.C., pp.3976–3977. ISBN: 978-1-4799-2077-8.
6. Donaher, Chris, Jesse Hatfield, Jessica Zeitz, and Stephen Davies (June 2010). Towards a Semantic Web editor for the layperson. (Peer-reviewed research poster). *Proceedings of the 7th Extended Semantic Web Conference (ESWC2010)*. Heraklion, Greece.

Honors, Grants, Awards

- Grellet C. Simpson Award. UMW's highest honor for Excellence in Undergraduate Teaching. August 2020.
- Chi Beta Phi Faculty Award. An annual student-nominated award which "honors exceptional professors in the sciences and mathematics who demonstrate a love of teaching, genuine outreach to students, and contribution to the university community." April 2013.
- Mary W. Pinschmidt Award. Awarded annually by UMW Senior class to the faculty member "whom they will most likely remember as the one who had the greatest impact on their lives." May 2010.
- UMW Jepson Fellowship, academic year 2009-2010: "Modeling Subjectivity in Database Exploration."
- Teaching Innovation Program summer 2007 faculty development grant: "Promoting Learning and Collaboration in Computer Science Through Team-based, Interdisciplinary Projects."
- Upsilon Pi Epsilon, inducted 2007.
- Residence Life Academic Teaching Award. Awarded to faculty who students in the Honors Residence Hall identify as having had significant impact on their success at the University of Colorado. April 2005.
- CU-LEAD Alliance Faculty Appreciation Award, for work with minority students. Given annually by the Leadership, Excellence, Achievement, and Diversity Alliance at the University of Colorado to selected faculty for demonstrating dedication and commitment to the success of underrepresented students. November 2004.

Subjects Taught

- DATA 101/219: Introduction/Foundations for Data Science
- CPSC 110: Introduction to Computer Science
- CPSC 220: Programming and Problem Solving
- CPSC 225: Software Development Tools
- CPSC 240: Object-oriented Analysis and Design
- CPSC 284: Applied Discrete Mathematics
- CPSC 305: Computer Systems & Architecture
- CPSC 326: Theoretical Foundations of Computing
- CPSC 340: Data Structures (as CPSC 230)
- CPSC 350: Applications of Databases
- CPSC 370: Special Topics: Database Essentials and Data Mining
- CPSC 415: Artificial Intelligence
- CPSC/DATA 419: Data Mining
- CPSC/DATA 420: Modeling and Simulation
- CPSC/DATA 470: Special Topics: Natural Language Processing
- CPSC 448: Advanced Web Application Development
- CPSC 470: Special Topics: The Semantic Web

References available upon request.