Stephen C. Davies

Curriculum Vitae

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Education

Ph.D. Computer Science University of Colorado, Boulder
Dissertation: *The efficacy of personal knowledge bases for materializing mental impressions*
Advisor: Roger King

M.S. Electrical Engineering University of Colorado, Boulder
Thesis: *Digital signal processing techniques for the automated recognition of musical tones*
Advisor: Delores Etter

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 computer science, data 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.

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. Finlayson, Ian and Stephen Davies (2024). Jguardrail: A framework for identifying possible errors in student Java code. *Proceedings of the Fortieth Annual Consortium for Computing Sciences in Colleges - Eastern Conference*. Emmitsburg, MD.

3. 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.

4. 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.

5. 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.

6. 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.

7. 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.

8. Parlante, Nick, Julie Zelenski, Stephen Davies, Joshua T Guerin, Dave O Hallaron, Debby Keen, Kevin Wayne, Zachary Kurmas, Daniel Zingaro, Daniel Zingaro, Joshua T Guerin, and Debby Keen (2012). Nifty Assignments. *Proceedings of the 43rd ACM Technical Symposium on Computer Science Education*. Raleigh, North Carolina, USA, pp.475–476. ISBN: 9781450310987. DOI: 10.1145/2157136.2157274.

9. 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.

10. 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.

11. Davies, Stephen (2011). Still building the memex. In: *Communications of the ACM* **54**(2), 80. ISSN: 00010782. DOI: 10.1145/1897816.1897840.

12. Davies, Stephen, Jesse Hatfield, Chris Donaher, and Jessica Zeitz (2010). User Interface Design Considerations for Linked Data Authoring Environments. *Proceedings of the WWW2010 Workshop on Linked Data on the Web, LDOW 2010, Raleigh, USA, April 27, 2010*. Ed. by Christian Bizer, Tom Heath, Tim Berners-Lee, and Michael Hausenblas. Vol. 628. CEUR Workshop Proceedings. CEUR-WS.org. https://ceur-ws.org/Vol-628/ldow2010%5C_paper17.pdf.

13. Davies, Stephen, Jessica Zeitz, and Jesse Hatfield (2010). Addressing the cognitive difficulties of expressing n-ary relations in semantic web data. en. *Proceedings of the 6th International Conference on Semantic Systems*. Graz Austria: ACM, pp.1–7. ISBN: 978-1-4503-0014-8. DOI: 10.1145/1839707.1839717. https://dl.acm.org/doi/10.1145/1839707.1839717.

14. Davies, Stephen, Roger Lamb, and Nicholas Odhiambo (2009). Non-intrusive techniques for enhancing decentralized data storage with strategic GIS visualization. *Proceedings of the 2009 WRI World Congress on Computer Science and Information Engineering*. Vol. 2, pp.379–383. ISBN: 9780769535074. DOI: 10.1109/CSIE.2009.566.

15. 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.

16. 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.

17. 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.

18. 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.

19. 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, Chris Donaher, Jesse Hatfield, and Jessica Zeitz (Jan. 2011). Making the Semantic Web usable: interface principles to empower the layperson. In: *Journal of Digital Information* **12**(1). Number: 1. ISSN: 1368-7506.

5. 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.

6. Davies, Stephen (2008a). Why should I care? Making programming assignments relevant for non-majors. In: *Journal of Computing Sciences in Colleges* **23**(3), 90–97. 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, Thomas Davies, and Alexis Kochanski (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.

- 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 Col-

orado to selected faculty for demonstrating dedication and commitment to the success of under-represented students. November 2004.

Subjects Taught

- FSEM 100: Freshman Seminar (Artificial Intelligence; History of Technology)
- DATA 101: Introduction to Data Science
- DATA 219: Foundations for Data Science
- CPSC 105: Problem-Solving with Databases
- 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 370: Special Topics: Computational Science
- 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

Service

- Program Director, Data Science program, 2013-2024.
- University Budget Advisory Committee, Secretary, 2019-2021.
- Data Mavens student club, Faculty Sponsor and Supervisor, 2016-present.
- Computer Science Graduate School Advisor, 2006-2007, 2013-present.
- "VIP Consultant" for DataFest competition, hosted virtually by Robert Morris University. 2022.
- "VIP Consultant" for DataFest competition, hosted virtually by Summit Data Analytics LLC and the University of Maryland. 2021.
- Invited speaker for UMW Chi Beta Phi chapter, 2018. (With Randall Reif.)
- Reviewer – CSSSA (Computational Social Science Society of the Americas) annual conference, 2017-2018.
- Department Chair, Computer Science, 2015-2018.
- Invited speaker for the Center for Social Complexity, Krasnow Institute for Advanced Study, George Mason University, 2017. (With Hannah Zontine.)
- Track co-Coordinator, Social and Behavioral Simulation Track – WSC (Winter Simulation Conference; affiliated with ACM SIGSIM), 2014-2016.
- Provost's 4-Credit Working Group, Chair, 2014-2015.
- President's Strategic Reallocation Task Force, Academic Subcommittee, 2013-2014.
- Invited speaker for the fall 2013 UMW Honor Convocation.
- University Curriculum Committee, University of Mary Washington; chair 2012-2013.
- University Faculty Council, University of Mary Washington, at-large representative, 2011-2013.
- CAS Faculty Senate, University of Mary Washington, 2010-2011.
- CAS Curriculum Committee, University of Mary Washington, member 2007-2008; secretary 2008-2009, chair 2009-2010.
- CAS Faculty Senate, parliamentarian 2008-2011.
- QEP (Quality Enhancement Plan) Planning Committee, 2011-2012, in preparation for SACS re-accreditation.

- RFP (Request For Proposals) committee for online course evaluations, 2011-2012.
- ACM Chapter Supervisor, 2010-2011.
- UMW Quantitative Reasoning Assessment Committee, representative from Computer Science, 2011-2013.
- Invited speaker for Summer Science Institute, summer 2009, 2010, 2013, 2018, and 2021.
- Department of Mathematics Search Committee – member 2008-2009.
- First-Year Advisor, University of Mary Washington, 2007-2011.
- Computer Science Career Advisor, 2007-2008, 2011-2012.
- PERLs student club, Faculty Sponsor and Supervisor, 2007-2010, 2012-2013.
- Invited speaker for Writing Intensive Program Summer Workshop, summer 2008.
- Invited speaker for Teaching Innovation Program (TIP) New Faculty Welcome, fall 2007.
- Invited presentation for Math Awareness Month: "Semantic Networks and the Quest for the Personal Knowledge Base," University of Mary Washington (2007).
- Computer Science Department Secretary, 2006-2007.
- Reviewer – *Social Science Computing Review*, 2021.
- Reviewer – ACM SIGCSE (Special Interest Group on Computer Science Education), 2007-2011.
- Reviewer – ACM ITiCSE (Innovation Technology in Computer Science Education), 2007-2011.
- Reviewer – FIE (Frontiers In Education) conference, 2010.
- Reviewer – VJAS (Virginia Junior Academy of Sciences), 2007.
- Programming Contest Coordinator – Consortium for Computing Sciences in Colleges Eastern Conference, 2007.

References available upon request.

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