Tiffani L. Williams

Teaching Professor and iCAN Director, University of Illinois Urbana-Champaign

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November 1, 2026

Summary

Interdisciplinary computer scientist, educator, and academic leader with two decades of experience spanning teaching, program development, and administrative leadership at three universities. Founded and directs the iCAN program at the University of Illinois Urbana-Champaign, a one-year pathway that enables college graduates without a computing background to earn a Graduate Certificate in Computing Fundamentals; previously founded a parallel program, Align, at Northeastern University. Research background in computational biology and phylogenetics, with NSF-funded work spanning two decades. Recognized with multiple teaching excellence awards and national honors for scholarship and efforts to broaden participation in computing.

Research Interests

Research interests span computer science education, multiple-pathway education, inclusive scientific communication, computational biology, phylogenetic tree inference, high-performance computing, and experimental performance studies of algorithms.

Education

Ph.D., Computer Science *2000*
University of Central Florida, Orlando, FL

- Dissertation: "A General-Purpose Model for Heterogeneous Computation"
- Advisor: Rebecca J. Parsons

B.S., Computer Science *1994*
Marquette University, Milwaukee, WI

Professional Appointments

Teaching (Full) Professor, Siebel School of Computing and Data Science *2020–Present*
(school formerly Department of Computer Science)
University of Illinois Urbana-Champaign, Urbana, IL

iCAN Director, Siebel School of Computing and Data Science *2020–Present*
(role formerly Director of On-ramp Programs)
University of Illinois Urbana-Champaign, Urbana, IL

- Founding director of iCAN (Illinois Computing Accelerator for Non-specialists), built from the ground up; led curriculum design, admissions and recruitment, teaching, and staff hiring and supervision for the one-year, 20-credit-hour graduate certificate program, launched Fall 2020 during the COVID-19 pandemic in a synchronous online format.

- Leads a team of three (Director, Associate Director, and Academic Advisor/Student Services Coordinator) and engages faculty from CS and other disciplines (e.g., linguistics, human development) to mentor students on capstone projects.
- Enrolled 131 students and graduated 74 since Fall 2020, serving a diverse cohort: 58.6% from non-STEM backgrounds, 42% women, and 46.2% aged 30 or older.
- Over 80% of iCAN graduates continue into Illinois' non-thesis Master of Computer Science (MCS) degree; 32 have completed the MCS to date (25 currently enrolled), and 6 have advanced to Illinois' Ph.D. program in CS.

Associate Director of Broadening Participation in Computing, Siebel School of Computing and Data Science *2023–2026*

(role formerly Associate Head of Broadening Participation in Computing)
University of Illinois Urbana-Champaign, Urbana, IL

- Oversaw the school's Broadening Participation in Computing (BPC) programs and activities.
- Partnered with Change Coaches, an external organizational consulting firm, to shape the school's BPC strategy, holding listening sessions and workshops for faculty, staff, and students to gather feedback and experiences.
- Developed five working groups from the findings: K–12 Outreach, Storytelling & Belonging, Community-Building Activities & Events, Culture & Climate, and BPC Education & Training.

Dean's Fellow in Belonging, Inclusion, and Engagement, Grainger College of Engineering *2021–2024*

University of Illinois Urbana-Champaign, Urbana, IL

- Member of the Dean's Cabinet.
- Led the development of Grainger CARES, an integrated support network that provides students, faculty, and staff with a safe, confidential avenue for reporting inappropriate or concerning behavior and connecting with relevant college and campus resources.
- Chaired a year-long committee examining the feasibility of offering a B.S. in Computer Science degree at the University of Illinois' downtown Chicago campus, reporting findings to the dean in a written report and presentation.

Director of Computer Science Programs, Khoury College of Computing Sciences *2017–2020*
Northeastern University at Charlotte, Charlotte, NC

- Founding director of the Northeastern Align program in Charlotte, NC. Align is a 2.5–3-year program that provides a pathway for non-CS graduates to earn a master's degree in CS.
- Adapted the curriculum from Align's Boston and Seattle programs, recruiting faculty, staff, and students, and teaching courses. Classes began in spring 2018 and were taught in person throughout the program.

Professor of the Practice, Khoury College of Computer Sciences *2017–2020*
Northeastern University at Charlotte, Charlotte, NC

Associate Professor *(Tenured)*, Department of Computer Science and Engineering *2011–2017*
Texas A&M University, College Station, TX

Applications Researcher, Institute for Applied Mathematics and Computational Science (IAMCS) *2010–2017*
Texas A&M University, College Station, TX

Affiliate Faculty, Interdisciplinary Research Program in Ecology and Evolutionary Biology *2008–2017*
Texas A&M University, College Station, TX

Assistant Professor, Department of Computer Science and Engineering *2005–2011*
Texas A&M University, College Station, TX

Edward, Frances, and Shirley Daniels Fellow, Radcliffe Institute for Advanced Study *2004–2005*
Harvard University, Cambridge, MA

Postdoctoral Research Fellow, Department of Computer Science *2001–2004*
The University of New Mexico, Albuquerque, NM

- Advisors: Bernard M. E. Moret and David A. Bader

Instructor/Visiting Lecturer, Department of Computer Science *1996–2001*
University of Central Florida, Orlando, FL

Honors & Awards

- Facilitating Learning Excellence Award, University of Illinois Urbana-Champaign, Fall 2025, Spring 2026.
- Teacher Ranked as Excellent by their Students, University of Illinois Urbana-Champaign, Fall 2020–Spring 2025 (10 semesters).
- The College Award for Sustained Excellence in Diversity, Equity, and Inclusion, Grainger College of Engineering, University of Illinois Urbana-Champaign, 2024.
- Association of Former Students (AFS) Distinguished Achievement Award in Teaching—College Level, Texas A&M University, 2016.
- Undergraduate Faculty Teaching Excellence Award, Department of Computer Science and Engineering, Texas A&M University, 2014.
- PopTech Science Fellow, 2012.
- Denice Denton Emerging Leader ABIE Award, AnitaB.org, 2011.
- Graduate Faculty Teaching Excellence Award, Department of Computer Science and Engineering, Texas A&M University, 2011.
- DARPA Computer Science Study Panel, 2006.
- Edward, Frances, and Shirley Daniels Fellow (Radcliffe Fellowship), Radcliffe Institute for Advanced Study, Harvard University, 2004–2005.
- Alfred P. Sloan Postdoctoral Fellowship in Computational Biology, 2002–2004.
- NSF CISE Postdoctoral Research Associate in Experimental Computer Science, 2002 *(award declined)*.
- Ford Foundation Postdoctoral Fellowship Program for Minorities, 2002 *(award declined)*.
- McKnight Doctoral Fellowship, Florida Education Fund, 1994–1999.
- Russell V. Ewald Award for Outstanding McKnight Doctoral Fellow, 1996.

- North American Philips Scholar, 1990–1994.
- Marquette Ignatius Scholar, 1990–1994.

Grants & Funded Research

- National Science Foundation, "Collaborative Research: PPoSS: LARGE: General-Purpose Scalable Technologies for Fundamental Graph Problems," $3,900,000 (total, 3 institutions), Senior Personnel (PI: Josep Torrellas, University of Illinois Urbana-Champaign), 2023–2028.
- National Science Foundation, "Collaborative Research: IUSE: A Data-Driven Employer-Academic Partnership for Continual Computing Curricular Change" (DUE-2111157), $2,627,967 (total, 9 institutions), PI (collaborative institution), 2021–2024.
- GIANT 2021: IDEA Institute, "Designing an Inclusive Language Framework that Cultivates Inclusive Cultures for Black Students, Faculty, and Staff," PI (Co-PIs: Nancy Amato and Karin Jensen, University of Illinois Urbana-Champaign), $12,043, 2021–2022.
- National Science Foundation / National Institute of Food and Agriculture, "AI Institute: Artificial Intelligence for Future Agricultural Resilience, Management, and Sustainability (AI-FARMS)" (AFRI grant no. 2020-67021-32799), $19,998,045 (total, 7 institutions), Co-PI (PI: Vikram Adve, University of Illinois Urbana-Champaign), 2020–2021 (grant active through 2025).
- National Science Foundation, "Phylogenomics and the Roles of Chromosome Architecture, Recombination and Hybridization on Phylogenetic Accuracy in the Cat Family (Felidae)" (DEB-1753760), $939,059, PI/collaborative institution (Lead PI/Institution: William J. Murphy, Texas A&M University), 2018–2021.
- "Texas Regional Collaborative for Computer Science," Co-PI (PI: Carolyn Schroeder; Co-PI: Philip Ritchey), $30,000, 2015–2016.
- National Science Foundation, "Collaborative Research: Automated and Community-Driven Synthesis of the Tree of Life" (DEB-1208337), $5,760,000 (total, collaborative award), PI/collaborative institution (Lead PI/Institution: Karen Cranston, NESCent), 2012–2017.
- National Science Foundation, "III:Small:Collaborative: Novel Techniques for Understanding Convergence in Large-Scale Markov Chain Monte Carlo Phylogenetic Analyses" (IIS-1018785), $500,000, Lead PI, 2010–2013.
- National Science Foundation, "ATOL Collaborative Research: Resolving Mammalian Phylogeny with Genomic and Morphological Approaches" (DEB-0629849), $600,000, Co-PI (PI: William Murphy, Texas A&M University), 2006–2012.
- National Science Foundation, "III-CTX: Large-Scale Analysis of Collections of Phylogenetic Trees" (IIS-0713618), $424,508 (plus $16,000 REU supplement, 2009), PI, 2007–2011.
- National Science Foundation (ITR Program), "Building the Tree of Life — A National Resource for Phyloinformatics and Computational Phylogenetics" (EF/BIO 03-31654), $11.6M (total, collaborative award; Co-PIs from 13 institutions), PI: B.M.E. Moret (UNM); Co-PI while at UNM, 2003–2008.
- Defense Advanced Research Projects Agency, "Computer Science Study Panel (CS2P)" (HR0011-06-1-0020), $81,535, PI, 2006–2007.
- Alfred P. Sloan Foundation / Department of Energy, "Alfred P. Sloan Postdoctoral Fellowship in Computational Molecular Biology" (DE-FG03-02ER63426), $120,000, PI, 2002–2004.

Publications

*Note: Williams' advisees denoted by *.*

Peer-Reviewed Journal Articles

- Harris, A. J., Foley, N. M., **Williams, T. L.**, & Murphy, W. J. (2022). Tree House Explorer: A novel genome browser for phylogenomics. *Molecular Biology and Evolution*, 39(6), msac130.
- Crosby, R. W., & **Williams, T. L.** (2017). Fast algorithms for computing phylogenetic divergence time. *BMC Bioinformatics*, 18(Suppl 15), 514.
- Hinchliff, C. E., Smith, S. A., Allman, J. F., Burleigh, J. G., Chaudhary, R., Coghill, L. M., Crandall, K. A., Deng, J., Drew, B. T., Gazis, R., Gude, K., Hibbett, D. S., Katz, L. A., Laughinghouse, H. D., McTavish, E. J., Midford, P. E., Owen, C. L., Ree, R. H., Rees, J. A., Soltis, D. E., **Williams, T.**, & Cranston, K. A. (2015). Synthesis of phylogeny and taxonomy into a comprehensive tree of life. *Proceedings of the National Academy of Sciences*, 112(41), 12764–12769.
- Crosby*, R. W., Valentine*, S., & **Williams, T. L.** (2014). Leveraging programming difficulty to improve understanding and perception of non-majors. *Journal of Computing Sciences in Colleges*, 29(4), 27–35.
- Meredith, R. W., Janecka, J. E., Gatesy, J., Ryder, O. A., Fisher, C. A., Teeling, E. C., Goodbla, A., Eizirik, E., Simao, T. L. L., Stadler, T., Rabosky, D. L., Honeycutt, R. L., Flynn, J. J., Ingram, C. M., Steiner, C., **Williams, T. L.**, Robinson, T. J., Burk-Herrick, A., Westerman, M., Ayoub, N. A., Springer, M. S., & Murphy, W. J. (2011). Impacts of the Cretaceous Terrestrial Revolution and KPg extinction on mammal diversification. *Science*, 334(6055), 521–524.
- Matthews*, S. J., & **Williams, T. L.** (2011). An efficient and extensible approach for compressing phylogenetic trees. *BMC Bioinformatics*, 12(Suppl 10), S16.
- Brammer*, G., & **Williams, T. L.** (2011). A new support measure to quantify the impact of local optima in phylogenetic analyses. *Evolutionary Bioinformatics*, 7, 159–170.
- Brammer*, G., Crosby*, R., Matthews*, S. J., & **Williams, T. L.** (2011). Paper Mache: Creating dynamic reproducible science. *Procedia Computer Science*, 4, 658–667.
- Sul*, S.-J., & **Williams, T. L.** (2011). Big cat phylogenies, consensus trees, and computational thinking. *Journal of Computational Biology*, 18(7), 895–906.
- Matthews*, S. J., & **Williams, T. L.** (2010). MrsRF: An efficient MapReduce algorithm for analyzing large collections of evolutionary trees. *BMC Bioinformatics*, 11(Suppl 1), S15. (Presented at the Asia-Pacific Bioinformatics Conference, ABPC '10.)
- Sul*, S.-J., Matthews*, S. J., & **Williams, T. L.** (2009). Using tree diversity to compare phylogenetic heuristics. *BMC Bioinformatics*, 10(Suppl 4), S3. (Special issue on best papers from IEEE BIBM '08.)
- **Williams, T. L.**, & Parsons, R. (2001). Practical experience using a computational model for the design of heterogeneous distributed software. *Journal of Research and Practice in Information Technology*, 33(3), 146–157.

Peer-Reviewed Conference Papers

- Gertner, Y., & **Williams, T.** (2025). An innovative one-year pathway to a master's in computer science for non-computing college graduates. *Proceedings of the 2025 ASEE Annual Conference & Exposition*, Montreal, QC, Canada.

- **Williams, T.**, Jensen, K., & James, I. (2022). Work in Progress: An Early Analysis of How Language Cultivates Inclusive Engineering Culture for Black Students, Faculty, and Staff. *Proceedings of the 2022 ASEE Annual Conference & Exposition*, Minneapolis, MN.
- **Williams, T.**, Gertner, Y., Amato, N., Gulley, A., Harris, J., & Viswanathan, M. (2022). Work in Progress: A New Graduate Certificate to Broaden Participation in Computing. *Proceedings of the 2022 ASEE Annual Conference & Exposition*, Minneapolis, MN.
- Brodley, C., Barry, M., Connell, A., Gill, C., Gorton, I., Hescott, B., Lackaye, B., LuBien, C., Razzaq, L., Shesh, A., **Williams, T.**, & Danyluk, A. (2020). An MS in CS for non-CS majors: Moving to increase diversity of thought and demographics in CS. *Proceedings of the 51st ACM Technical Symposium on Computer Science Education (SIGCSE '20)*, 1248–1254.
- Crosby*, R. W., & **Williams, T. L.** (2012). A fast algorithm for computing the all-to-all quartet distance across large collections of phylogenetic trees. *International Symposium on Bioinformatics Research and Applications (ISBRA '12)*, Lecture Notes in Computer Science, vol. 7292, 60–71.
- Matthews*, S. J., Sul*, S.-J., & **Williams, T. L.** (2010). A novel approach for compressing phylogenetic trees. *International Symposium on Bioinformatics Research and Applications (ISBRA '10)*, Lecture Notes in Computer Science, vol. 6053, 113–124.
- Brammer*, G., & **Williams, T. L.** (2010). Decision tree learning to analyze collections of evolutionary trees. *Computational Intelligence in Bioinformatics and Computational Biology (CIBCB '10)*, 227–234.
- Sul*, S.-J., & **Williams, T. L.** (2009). An experimental analysis of consensus tree algorithms for large-scale tree collections. *International Symposium on Bioinformatics Research and Applications (ISBRA '09)*, Lecture Notes in Computer Science, vol. 5542, 100–111.
- Park*, H.-J., & **Williams, T. L.** (2009). A fitness distance correlation measure for evolutionary trees. *1st International Conference on Bioinformatics and Computational Biology (BiCoB '09)*, Lecture Notes in Computer Science, vol. 5462, 331–342.
- Sul*, S.-J., Matthews*, S. J., & **Williams, T. L.** (2008). New approaches to compare phylogenetic search heuristics. *IEEE International Conference on Bioinformatics and Biomedicine (BIBM '08)*, 239–245.
- Sul*, S.-J., Brammer*, G., & **Williams, T. L.** (2008). Efficiently computing arbitrarily-sized Robinson-Foulds distance matrices. *Workshop on Algorithms in Bioinformatics (WABI '08)*, Lecture Notes in Computer Science, vol. 5251, 123–134.
- Sul*, S.-J., & **Williams, T. L.** (2008). An experimental analysis of Robinson-Foulds distance matrix algorithms. *European Symposium on Algorithms (ESA '08)*, Lecture Notes in Computer Science, vol. 5193, 793–804.
- Sul*, S.-J., & **Williams, T. L.** (2007). A randomized algorithm for comparing sets of phylogenetic trees. *Asia-Pacific Bioinformatics Conference (APBC '07)*, 121–130.
- **Williams, T. L.**, & Smith, M. L. (2006). The role of diverse populations in phylogenetic analysis. *The Genetic and Evolutionary Computation Conference (GECCO '06)*, 287–294.
- Smith, M. L., & **Williams, T. L.** (2006). Phylospaces: Evolutionary trees and tuple space. *IEEE Workshop on High-Performance Computational Biology (HiCOMB '06).*
- **Williams, T. L.**, & Smith, M. L. (2005). Cooperative Rec-I-DCM3: A population-based approach for reconstructing phylogenies. *IEEE Symposium on Computational Intelligence in Bioinformatics and Computational Biology (CIBCB '05)*, 127–134.
- Roshan, U., Moret, B. M. E., **Williams, T. L.**, & Warnow, T. (2004). Rec-I-DCM3: A fast

algorithmic technique for reconstructing large phylogenetic trees. *Proceedings of the 3rd IEEE Computational Systems Bioinformatics Conference (CSB '04)*, 98–109.

- **Williams, T. L.**, & Moret, B. M. E. (2003). An investigation of phylogenetic likelihood methods. *Proceedings of the 3rd IEEE Symposium on Bioinformatics and Bioengineering (BIBE '03)*, 79–86.
- **Williams, T. L.**, & Parsons, R. (2001). Exploiting hierarchy in heterogeneous environments. *Workshop on Advances in Parallel and Distributed Computational Models (APDCM '01)*, in conjunction with IPDPS '01.
- **Williams, T. L.**, & Parsons, R. (2000). The heterogeneous bulk synchronous parallel model. *Workshop on Advances in Parallel and Distributed Computational Models (APDCM '00)*, Lecture Notes in Computer Science, 102–108.
- **Williams, T. L.**, & Goudreau, M. (1998). An experimental evaluation of BSP sorting algorithms. *10th IASTED International Conference on Parallel and Distributed Computing Systems (PDCS '98)*, 115–118.
- Parsons, R., & **Williams, T. L.** (1998). Alternative fitness functions and their effect on the evolution of hierarchically-related individuals. *Massively Parallel Computing Systems*.

Book Chapters

- Sul*, S.-J., & **Williams, T. L.** (2011). Big cats, consensus trees, and computational thinking. In P. Pevzner & R. Shamir (Eds.), *Bioinformatics for Biologists* (pp. 248–266). Cambridge University Press.
- Park*, H.-J., Sul*, S.-J., & **Williams, T. L.** (2010). Large-scale analysis of phylogenetic search behavior. In H. R. Arabnia (Ed.), *Advances in Computational Biology* (Vol. 680, pp. 35–42). Springer.
- **Williams, T. L.**, Yan, M., Bader, D. A., & Moret, B. M. E. (2006). High-performance phylogeny reconstruction under maximum parsimony. In A. Y. Zomaya (Ed.), *Parallel Computing for Bioinformatics and Computational Biology* (pp. 369–394). John Wiley & Sons.
- Roshan, U., Moret, B. M. E., **Williams, T. L.**, & Warnow, T. (2004). Performance of supertree methods on various dataset decompositions. In O. R. P. Bininda-Emonds (Ed.), *Phylogenetic Supertrees* (pp. 301–328). Kluwer Publishers.

Public Scholarship & Op-Eds

- **Williams, T. L.** (2022). "The Lives of Hidden Figures Matter in Computer Science Education." *Communications of the ACM*, 65(2), 20–22. (Editorially reviewed.)
- **Williams, T. L.** (2020). "'Underrepresented Minority' Considered Harmful, Racist Language." *Communications of the ACM*, BLOG@CACM.

  Selected examples of impact (not exhaustive):

  - Cited by the Computing Research Association (CRA) as the basis for its renaming (November 18, 2020) of the "Grad Cohort for URMD Workshop" to "The IDEALS Workshop" (Inclusion, Diversity, Equity, Accessibility, and Leadership Skills).
  - Cited in Gibbens, B. (n.d.), *Acknowledging and Addressing the Achievement Gaps in Undergraduate Education* (University of Minnesota Libraries Publishing), as the basis for adopting the term "AHN" (African American/Black, Hispanic/Latino(a), Native American/Alaskan Native) in place of URM.

- Cited 73 times (Google Scholar, as of October 2026).

Invited Talks, Panels, & Presentations

- "We've Been Here Before: Innovations in Computing," 2026 CRA Summit (invitation-only), Computing Research Association (CRA), Prior Lake, MN, July 23, 2026 — Panelist.
- "How to Succeed in Graduate School," Merge Campus Visit Program, The Grainger College of Engineering, University of Illinois Urbana-Champaign, Urbana, IL, 2023, 2024, 2025 — Keynote Speaker, hosted by Grainger Engineering's Director for Graduate Student Success.
- "Computational Tools for Analyzing and Visualizing Large-Scale Phylogenetic Relationships," Algorithmic Advances and Implementation Challenges: Developing Practical Tools for Phylogenetic Inference (invitation-only), Institute for Computational and Experimental Research in Mathematics (ICERM), Brown University, Providence, RI, November 22, 2024 — Invited Speaker.
- "Leading Culture Shifts to Broaden Participation: An Interactive Session for Engineering Leaders," 2023 Collaborative Network for Engineering and Computing Diversity (CoNECD), New Orleans, LA, February 28, 2023 — Co-Facilitator (with Don Takehara, University of Illinois Urbana-Champaign, and Jet LeBlanc, AtKisson Training Group).
- "Building Strong Partnerships with HBCUs," Diverse Voices Speaker Series, Office of the Vice Chancellor for Research & Innovation, University of Illinois Urbana-Champaign, May 5, 2022 — Invited Speaker.
- "The Lives of Hidden Figures Matter in CS Education," Equity & Justice in Computing Series, Department of Computer Science, University of Illinois Urbana-Champaign, April 20, 2022 — Invited Speaker.
- "Language Matters: DEI and the Question of URM," Diversity, Equity, and Inclusion in Computing Education Webinar Series, Association for Computing Machinery (ACM), April 20, 2022 — Invited Speaker (with Nicki Washington, Duke University; moderated by Fay Cobb Payton, Kapor Center).
- "Starting a New Broadening Participation in Computing Program During a Pandemic," Illinois Computer Science Summer Teaching Workshop (iCSTWS), University of Illinois Urbana-Champaign, Virtual, August 11, 2021 — Invited Speaker.
- "New Pathways to Address the Tech Talent Gap and Broaden Participation in Computing," Luddy School of Informatics, Computing, and Engineering, Indiana University, Bloomington, IN, March 5, 2021 — Invited Speaker.
- "Language Matters: Abolishing the Harmful and Racist Label 'Underrepresented Minority'," University of Illinois Urbana-Champaign, Department of Computer Science, September 16, 2020 — Invited Speaker.
- "Celebrate the Present, Past, and Future of Black Women in Computing+Technology," blackcomputeHER Conference, Washington, DC, April 5, 2019 — Keynote Speaker.
- "Beyond the Gridiron: Winning with Diverse Women in Tech," invited track for ABIE Award Winners, Grace Hopper Celebration, Houston, TX, September 28, 2018.
- "Discovering Relationships in the Tree of Life," UNC Charlotte, Bioinformatics and Software and Information Systems Seminar, Charlotte, NC, April 22, 2016.
- "Searching for Meaning in the Tree of Life," Capital Celebration of Women in Computing

(CAPWIC), Richmond, VA, March 15, 2014 — Keynote Speaker.

- "The Tree of Life: A Computer Scientist's Perspective," PopTech, Camden, ME, October 19, 2012.
- "The Magical Powers of Computing," speaker, Aleif Middle School, Houston, TX, May 25, 2012.
- "The Magical Powers of Computing," Expanding Your Horizons (EYH) in Science & Mathematics, Northbrook Middle School, Houston, TX, March 3, 2012 — Keynote Speaker.
- "Discovering Relationships in the Tree of Life," Denice Denton Emerging Leader Award talk, Grace Hopper Celebration of Women in Computing, Portland, OR, November 11, 2011.
- "Women of Color Luncheon," keynote speaker, Grace Hopper Celebration of Women in Computing, Portland, OR, November 10, 2011.
- "How Can Your Work Be More Impactful?," University of British Columbia, Department of Computer Science, July 12, 2011.
- "Paper Mâché: A Novel System for Executing Scientific Papers," AMP Workshop: Reproducible Research: Tools and Strategies for Scientific Computing, Vancouver, Canada, July 12, 2011.
- "TreeZip: A New Algorithm for Compressing Large-Scale Phylogenetic Tree Collections," University of British Columbia, Department of Computer Science, Vancouver, Canada, June 25, 2010.
- "Fast Hash-Based Algorithms for Analyzing Tens of Thousands of Evolutionary Trees," invited mini-symposium on Computational Biology, 2010 SIAM Conference on Discrete Math (DM'10), Austin, TX, June 17, 2010.
- "Computational Approaches for Constructing Majority Consensus Trees," RECOMB Satellite Conference on Bioinformatics Education (RECOMB-BE'10), San Diego, CA, May 23, 2010.
- "Bringing Life to Computing," keynote speaker, NCWIT Award for Aspirations in Computing, Rice University, Houston, TX, February 27, 2010.
- "High-Performance Algorithms for Analyzing Large Collections of Evolutionary Trees," Broader Engagement lecture, Supercomputing (SC'09), Portland, OR, November 16, 2009.
- "Using the MapReduce Framework to Analyze Large Collections of Evolutionary Trees on Multi-Core Platforms," The Winifred Asprey Lecture Series in Computer Science, Vassar College, Poughkeepsie, NY, October 13, 2009.
- "MapReduce Algorithms for Summarizing Evolutionary Trees on Multi-Core Platforms," University of British Columbia, Department of Computer Science, Vancouver, Canada, June 30, 2009.
- "New Techniques for Analyzing Large Collections of Evolutionary Trees," University of British Columbia, Department of Computer Science, Vancouver, Canada, July 29, 2008.
- "A Cooperative Search Heuristic to Infer Evolutionary Trees," INFORMS International Conference, Puerto Rico, July 2007.
- "Efficiently Comparing Large Collections of Evolutionary Trees," Simon Fraser University, Department of Computer Science, Vancouver, Canada, June 14, 2007.
- "Efficiently Comparing Large Collections of Evolutionary Trees," University of British Columbia, Department of Computer Science, Vancouver, Canada, June 12, 2007.
- "The Landscape of Life," Workshop on Biographs, Stazione Zoologica Anton Dohrn, Naples, Italy, May 19, 2007.
- "Efficiently Comparing Large Collections of Evolutionary Trees," Santa Fe Institute, Santa Fe, NM, April 16, 2007.

- "Using Cooperation to Infer Large-Scale Evolutionary Trees," University of British Columbia, Department of Computer Science, Vancouver, Canada, July 7, 2006.
- CRA-W Graduate Cohort Workshop, Computing Research Association (CRA), 2006–2013, 2015 — Invited Speaker.
- "New Techniques for Building Large-Scale Evolutionary Trees," Yale University, Department of Computer Science, New Haven, CT, May 13, 2005.
- "New Techniques for Building Large-Scale Evolutionary Trees," Colby College, Department of Computer Science, Waterville, ME, April 15, 2005.
- "An Integrated Approach to Building Evolutionary Trees," Radcliffe Institute of Advanced Study, Harvard University, Cambridge, MA, February 9, 2005.

Teaching

Taught 18 distinct courses over two decades (2005–present) at Texas A&M University, Northeastern University, and the University of Illinois Urbana-Champaign, spanning introductory programming, algorithms, and formal languages and automata for undergraduates, and computational biology and phylogenetics for graduate students. Also taught introductory procedural and object-oriented programming, discrete mathematics, and algorithms to non-computing college graduates through Northeastern's Align and Illinois' iCAN programs.

Courses Taught

University of Illinois Urbana-Champaign — iCAN Program

- CS 400: Accelerated Fundamentals of Computing I, renumbered and retitled from CS 498 (Fall 2021, Fall 2022, Fall 2023, Fall 2024, Fall 2025, Fall 2026).
- CS 402: Accelerated Fundamentals of Computing II, renumbered and retitled from CS 498 (Spring 2022, Spring 2023, Spring 2024, Spring 2025, Spring 2026).
- CS 491: Excursions in Computing I, renumbered from CS 591 (Fall 2021, Fall 2022, Fall 2023, Fall 2024, Fall 2025, Fall 2026).
- CS 491: Excursions in Computing II, renumbered from CS 591 (Spring 2022, Spring 2023, Spring 2024, Spring 2025, Spring 2026).
- CS 498: Fundamentals of Computer Science I (Fall 2020).
- CS 498: Fundamentals of Computer Science II (Spring 2021).
- CS 591: Excursions in Computing I (Fall 2020).
- CS 591: Excursions in Computing II (Spring 2021).
- CS 597: Individual Study, capstone mentorship (ongoing).

Northeastern University — Align Program

- CS 5001: Intensive Foundations of Programming (Spring 2018).
- CS 5002: Discrete and Data Structures (Spring 2018, Fall 2018).
- CS 5006: Algorithms (Summer 2018, Spring 2019).
- CS 5007: Computer Systems (Summer 2018, Spring 2019).
- CS 5800: Algorithms (Fall 2018).

Texas A&M University

- CSCE 110: Programming I (Spring 2011, Fall 2011, Spring 2012, Spring 2013, Fall 2013, Spring 2014, Fall 2014, Spring 2015). Redesigned the course around Python to make programming more accessible and engaging for non-CS majors; laid the foundation for her later work building computing pathways at Northeastern (Align) and Illinois (iCAN).
- CSCE 411: Design and Analysis of Algorithms (Summer 2014, Summer 2015, Summer 2016, Fall 2016, Spring 2017).
- CSCE 433 (previously CPSC 433, Spring 2007–Spring 2009): Formal Languages and Automata (Spring 2007, Spring 2008, Spring 2009, Spring 2010, Spring 2013, Spring 2015, Spring 2016).
- CSCE 481: Seminar (Fall 2009).
- CSCE 627: Theory of Computability (Spring 2010, Spring 2013, Spring 2015, Spring 2016, Spring 2017).
- CSCE 628 / BICH 628 (previously CPSC 628 / BICH 628, Fall 2005–Fall 2008): Computational Biology (Fall 2005, Fall 2007, Fall 2008, Fall 2009, Fall 2010, Fall 2011, Fall 2013, Spring 2016).
- CPSC 689: Algorithms for Evolutionary Bioinformatics (Spring 2008).
- CPSC 689: Computational Phylogenetics (Spring 2006).

Teaching Innovation & Impact

- Designed the full 20-credit iCAN curriculum from the ground up — a one-year (fall, spring, summer) pathway enabling non-computing college graduates to earn a Graduate Certificate in Computing Fundamentals.
- Delivered the Align pathway curriculum — bridging courses through the first M.S.-level course — for non-computing college graduates at Northeastern University at Charlotte, building original course materials for each offering.

Graduate Student Advising

Advised 4 Ph.D. students to completion (2009–2015) and 1 M.S. student (2007).

- Ralph Crosby (Ph.D. 2015), "Phylogenetic Divergence Time: Algorithms for Improved Accuracy and Performance"; currently Senior Principal Software Engineer, Sierra Space.
- Grant Brammer (Ph.D. 2014), "Algorithms for Searching and Analyzing Sets of Evolutionary Trees"; currently Data Scientist, Apple.
- Suzanne J. Matthews (Ph.D. 2012), "Efficient Algorithms for Comparing, Storing, and Sharing Large Collections of Evolutionary Trees"; currently Professor, United States Military Academy at West Point.
- Seung-Jin Sul (Ph.D. 2009), "Fast Hash-Based Algorithms for Analyzing Large Collections of Evolutionary Trees"; currently Staff Software Developer, Lawrence Berkeley National Laboratory.
- Hyun-Jung Park (M.S. 2007), "Large-Scale Analysis of Phylogenetic Search Behavior"; currently Associate Professor, University of Pittsburgh.

Undergraduate Research & iCAN Capstone Mentoring

University of Illinois Urbana-Champaign — iCAN Program

Faculty mentor for ten iCAN capstone projects (2021–present), spanning applications such as a

desktop tool for analyzing concrete deep beams for structural engineers, an automated tool for detecting price differences across decentralized exchanges (DEXs), and a web application for exploring employment data and education pathways into different careers. Eight of her capstone students continued their graduate CS studies in Illinois' non-thesis Master of Computer Science (MCS) program.

Note: $*$ denotes iCAN capstone students that enrolled in Illinois' non-thesis Master of Computer Science (MCS) program. $**$ denotes MCS graduates.

- Daniel Dumas de Teresa*, Summer 2026.
- Scott Gringauz*, Summer 2026.
- Mengmeng Fang*, Summer 2025.
- Vlad Sauic*, Summer 2025.
- Wanli Zhou*, Summer 2024.
- Amanda Featherstone*, Summer 2024.
- Peter Pangiotopoulos**, Summer 2023.
- Nathan Grace**, Summer 2023.
- Melvin Kuchefski, Summer 2023.
- Nathan Volles, Summer 2023.

Texas A&M University (2006–2016)

Mentored nine undergraduate researchers, including participants in the NSF Research Experiences for Undergraduates (REU) and CRA-W Distributed Research Experiences for Undergraduates (DREU) programs. One mentee, Suzanne J. Matthews, went on to earn her Ph.D. under Williams and is now a faculty member at the United States Military Academy at West Point.

- Gregory Krupit (Texas A&M University): Fall 2016.
- Cristina Corales (Texas A&M University): Fall 2014–Fall 2015.
- Arthur Philpott (Texas A&M University): Fall 2009–Spring 2012. Supported by NSF's Research Experience for Undergraduates (REU) program.
- Kymberleigh Pagel (Indiana University): Summer 2011. Supported by CRA-W's Distributed Research Experience for Undergraduates Program (DREU).
- Beenish Jamil (George Mason University): Summer 2010. Supported by CRA-W's Distributed Research Experiences for Undergraduates Program (DREU).
- William Dawson (Grove City College): Summer 2009. Supported by NSF's Research Experience for Undergraduates (REU) program.
- Clarice Richardson (Medgar Evers College): Summer 2009. Supported by CRA-W's Distributed Research Experiences for Undergraduates Program (DREU).
- Katie Timmerman (Wright State University): Summer 2009. Supported by CRA-W's Distributed Research Experiences for Undergraduates Program (DREU).
- Cadran Cowansage (Colby College): Summer 2007. Supported by CRA-W's Distributed Mentor Project (DMP).
- Suzanne J. Matthews (Rensselaer Polytechnic Institute): Summer 2006. Supported by CRA-W's Distributed Mentor Project (DMP).

Selected University & Professional Service

Service at the university, college, and departmental levels at the University of Illinois Urbana-Champaign.

University Service

- Faculty Senate, Member (Elected), University-wide, 2020–2022.
- Illini Success Survey Task Force, Member, University-wide, 2020–2021.

College Service

- Dean's Cabinet, Member, The Grainger College of Engineering, 2021–2024.
- Exploring BS in CS in Chicago, Chair, The Grainger College of Engineering, 2022–2023.
- Diversity Committee, Member, The Grainger College of Engineering, 2020–2021.
- Anti-Racism Task Force, Member, The Grainger College of Engineering, 2020.

Department Service

- PhD Launch Committee, Member, Siebel School of Computing and Data Science, 2026–Present.
- Promotion and Tenure Committee, Member (Elected), Siebel School of Computing and Data Science, 2022–Present.
- CS CARES Committee, Vice-Chair, Department of Computer Science, 2021–2022.
- Advisory Committee, Member (Elected), Department of Computer Science, 2021.
- Broadening Participation Committee, Member, Department of Computer Science, 2020–2021.

Professional & External Service

- Illinois Computer Science Summer Teaching Workshop (iCSTWS), Organizing Committee Member, University of Illinois Urbana-Champaign, 2024.
- IEEE Computer Society Diversity and Inclusion Committee, Member, IEEE Computer Society, 2022–2023.
- ACM DEI System Change Co-Chair, Chair, 2021-2022.
- Committee on Systemic Change in ACM, Member, 2020–2021.
- Denice Denton Emerging Leader ABIE Award Selection Committee, Chair (2020, 2022) / Co-Chair (2017–2019).
- *Systematic Biology*, Associate Editor, 2010–2017.
- Grace Hopper Celebration for Women in Computing, General Co-Chair, 2014.
- Distributed Research Experiences for Undergraduates (DREU) program, Co-Director, 2011–2013.

Workshops, Short Courses, and Tutorials

- *Break into Tech: A Gentle Introduction to Computer Science*, a two-day workshop at Northeastern University at Charlotte.
  - 2017: Offered 3 times (October, November, and December).
  - 2018: Offered 7 times (February, March, April, June, July, October, and November).
  - 2019: Offered 2 times (February and April).

  - Short video summarizing the first day of the workshop (7/14/18): bit.ly/3w8txfh.

- WeTeach CS TAMU: Professional Development for CS Teachers, Texas A&M University, 3/19/2016–4/29/2016.
- *To Write What is Worth Publishing*, TAMUS LSAMP, Texas A&M University, College Station, TX, November 30, 2011.
- *How to Give A Great Scientific Talk*, University of British Columbia, Vancouver, Canada, February 25, 2011.
- *Goal Setting in Graduate School*, TAMUS LSAMP, Texas A&M University, College Station, TX, October 7, 2010.
- *Are They Really Listening? How to Give Scientific Presentations*, Women in Theory Workshop, Princeton University, Princeton, NJ, June 17, 2008.
- *Are They Really Listening? How to Give Scientific Presentations*, Richard Tapia Celebration of Diversity in Computing Conference, Orlando, FL, October 15, 2007.

Professional Memberships

- American Society for Engineering Education (ASEE) (Member)
- Association for Computing Machinery (ACM) (Member)
- blackcomputeHER (Founding Member)