

INVITED TALKS

Invited Technical Presentations

1. S. J. Matthews, “Single board computers for cyber security.” Invited Talk (Remote), Belmont University, October 2021
2. S. J. Matthews, “Maximizing computing on minimal hardware.” Invited Talk, Skidmore College, Saratoga Springs NY, March 2019
3. S. J. Matthews, “Leveraging single board computers for low-energy computing.” Invited Talk, Rochester Institute of Technology, Rochester NY, October 2018
4. S. J. Matthews, “Tomorrow’s personal computer.” Online: <https://youtu.be/KaX-nCjiV5g>. TEDx - West Point, West Point NY. February 1, 2018
5. S. J. Matthews, “Parallel computing on the raspberry pi.” TeenTech NY Conference, New York NY, November 2017
6. S. J. Matthews, R. A. Brown, J. C. Adams, and E. Shoop, “An introduction to parallel computing on the raspberry pi.” 2017 SIAM Conference on Computational Science & Engineering (CSE’17) - Broader Engagement Program, Atlanta GA, March 2017
7. R. A. Brown and S. J. Matthews, “Roundtable workshop: PDC in core undergraduate education.” 2016 IEEE International Parallel & Distributed Processing Symposium (IPDPS’16), Chicago IL, May 2016
8. S. J. Matthews, “Student parallella and student pi.” 2015 CSinParallel Workshop, Chicago IL (remote talk), August 2015
9. S. J. Matthews, “Saving the forest for the trees: The case for preserving phylogenetic tree collections.” ACM International Workshop on Big Data in Life Sciences (BigLS’15), Atlanta GA, September 2015
10. S. J. Matthews and W. T. L., “An efficient and extensible approach for compressing phylogenetic trees.” 2011 Evolution Conference, Norman OK, June 2011

Invited Talks for Mentorship

- “Choosing What’s Right For You”, Grace Hopper Conference Town Hall series, 2015 Grace Hopper Conference, Houston TX, October 15, 2015.
- “Pitching Yourself Forward”, Girls Who Code speaker series, Girls Who Code HQ, Goldman Sachs, New York, NY, August 9, 2013.
- “Achieving Your Dreams with Computer Science and Engineering”, Mother-Daughter Engineering Breakfast, Suffern Middle School, Suffern NY, Feb 2, 2013.

LEADERSHIP

National Conference/Workshop Leadership

- Founder and Co-chair, Jean Bartik Computing Symposium (2022, 2020, 2019)
- Co-organizer, CSinParallel 2021 Virtual Summer Workshop, June 21-23, 2021.
- Co-organizer, CSinParallel 2020 Virtual Summer Workshop, July 8-10, 2020.
- Scholarship Committee Co-Chair, Grace Hopper Celebration of Women in Computing (2019, 2018, 2017, 2016, 2015, 2014)
- Paper Session Chair, ACM SIGCSE (2019, 2018, 2015), CCSC-Eastern (2015)
- Guest Editor, Journal of Information Security & Applications (2018)
- Student Papers Chair, ICDIS’18 Conference (2018)
- Co-organizer, CSinParallel 2016 Delaware Valley Regional Workshop. Villanova University, July 11-14, 2016.

Academy/Department Leadership

- Co-Chair, Dean’s Working Group on West Point Scholarship Programs, 2021
 - Harper D and Matthews SJ. “White Paper on Scholarship Programs at West Point”. FOUO. 28 pages. Provided to Dean, U.S. Military Academy.
- Founder and Faculty Chair, EECS Systems (ACM-W chapter), 2012 - Present
- Chair, USMA Dean’s Service Award Committee, 2022, 2020, 2019, 2018
- Workshop Co-organizer, USMA HPC Users Workshop, 2016 - Present
- Brownbag Discussion Leader, EECS Brown Bag: “Inclusive Excellence: Speaking

the Subtext”. 08/22/2018.

Community STEM Outreach Leadership

- “Packet Sniffing on the Raspberry Pi”, New York City-area schools, West Point NY, Nov. 6, 2018, Dec. 10, 2018. With Clay Moody, Ray Blaine, and Joseph Sagisi.
- “Hour of Code: The Adventures of ScriptKitty”, West Point Middle School Coding Club, West Point, NY, April 17, 2018.
- “Hour of Code: Learning Scratch on the Raspberry Pi”, West Point Middle School Coding Club, West Point, NY, Dec. 5, 2017. With Katherine Duncan.
- “Hour of Code: Picobot”, Brooklyn High Schools (Grand Street Campus), Brooklyn, NY, Jun. 2, 2017. With Akintayo Holder and Ethan Glasser-Camp.
- “Hour of Code: Dragon Dash”, West Point Middle School Coding Club, West Point, NY, Feb. 21, 2017. With Benjamin Klimkowski.
- “Hour of Code: Build an App with MIT App Inventor”, Project Hope/Detroit Public Schools, Detroit, MI, November 25, 2014. With CDT Alex Molnar, John Borger, Megan Conger, Tre’Anna Smith, Alicia Clark, Alexandra Davis and Alexa Porcaro.
- “Hour of Code: Build an App with MIT App Inventor”, STEM for Girls Workshop, United States Military Academy, West Point, NY, March 8, 2014. With Jean Blair and Peggy Leonowich-Graham.

TEACHING

Courses Taught (Designer[§], Course Director[†])

CS 380 - Computer Organization^{§†} : I designed this course to give students an appreciation of how the code they write is influenced and impacted by the underlying hardware. The course is the students’ first introduction to C programming, and is required by all majors. AY16, AY17, AY18-1, AY19-1, AY21-1, AY22

XE 401/402 - Integrative Capstone Experience : Supervised and provided technical mentorship to 10 capstone teams over the Computer Science, Information Technology and Electrical Engineering programs, involving approximately 37 cadets. Several students have written papers that were accepted to peer-reviewed venues, and won awards for their capstone work. AY15, AY16, AY17, AY18, AY19.

CS 474 - Fundamentals of Computer Theory[†] : Introduces students to the theoretical underpinnings of the computing discipline, including the classes of problems that can (and cannot) be solved by modern computers. AY14-1, AY17-2, AY18-2, AY19-2.

CS387/489 - Advanced Individual Study in Computer Science : An opportunity for students to explore advanced topics in computing through a personal research project that is conducted over the course of a semester. AY15-1, AY18-2, AY21-1, AY22

CS 485 - Parallel Computing^{§†} : An upper-level computer science elective that I designed to help pilot the introduction of parallel computing concepts into the core CS curriculum. A significant portion of the parallel computing concepts covered in this course were incorporated into the design of CS380. AY15-2.

CS 301 - Fundamentals of Computer Science^{§†} : First course in sequence for Computer Science majors. While the course was originally taught in Ada, I was tasked my first semester as a faculty member to redesign the course completely. The version I designed introduced students to the Python language, in lieu of Ada. The course would go on to be the first course in major for CS majors, IT majors, and students in the Cyber sequence. AY13-2, AY14, AY15.

IT 105 - Introduction to Computing & Information Technology : CS0 core course that is required for all freshmen at West Point. Provides a breadth-first introduction to computing, information technology, and electronics. AY13-1.

ADVISING

Select Undergraduate Research Students

I have supervised or co-supervised more than 50 undergraduate students in various research projects, including 8 women and 6 minority male students. Nearly a quarter have gone on to attend graduate programs, several on prestigious scholarships. A few are highlighted below:

- Spencer Drakontaidis (USMA'18): 05/17 - 05/18. M.S. in Computer Science, Stanford University.
- 1LT Andrés Alejos (CY): 08/17 - 05/18. GEM Fellowship, M.S. in Computer Science, Purdue University.
- CPT Leonard Kosta (CY): 05/16 - 05/17. Draper Laboratories Graduate Fellowship. M.S. in Computer Science, Boston University.
- CPT Jinny Yan (CY): 08/15 - 05/16. MIT Lincoln Labs Military Fellowship. Masters in Computer Science, Northeastern University.
- Lisa Jones (CY, RET): 08/13 - 05/16. 2016 Churchill Scholar; 2016 CRA Outstanding Female Researcher Award; 2016 NSF Graduate Research Fellowship; 2013-2014 CRA-W CREU Awardee. M.S. in Mathematics, Cambridge University.
- Andreas Kellas (CY, RET): 08/14-05/15. Currently pursuing Ph.D. in Computer Science at Columbia University.
- CPT Leo St. Amour (CY): 08/14-05/15. MIT Lincoln Labs Military Fellowship. M.S. in Computer Science, Northeastern University (2017).
- Frederick Ulrich (CY, RET): 08/14-05/15. MIT Lincoln Labs Military Fellowship. M.S. in Computer Science, Northeastern University (2017).
- CPT Joseph Hannigan (CY): 08/12-05/14. Honorable Mention, NSF Graduate Research Fellowship.
- 2013-2014 CRA-W CREU Program Students: CPTs Rosemary Betros, Jorge Figueroa-Cecco, Lisa Jones, Nathaniel Rollings, and Bryce Tyson.

Other Advising

Department Academic Counselor : I have served as the official Department Academic Counselor (DAC) for 20 computer science majors. I helped them create their 8-term academic plans, advised them on electives, and helped them solidify their plans for after graduation.

Graduate School Mentor : I have mentored additional cadets through the scholarship process, even though they did not directly do research with me. I helped them understand the path to graduate school, what options are possible, and wrote letters of recommendation for them. Three are currently attending graduate school on competitive scholarships.

RESEARCH FUNDING

External Funding

1. National Science Foundation, *Collaborative Research: Developing Dynamic and Interactive Materials to Teach Computing Systems Concepts to All Students*. PIs: Suzanne J. Matthews (West Point), Tia Newhall (Swarthmore College Co-PI) Kevin Webb (Swarthmore College Lead-PI) \$598,274.00 (West Point's portion: \$112,752.00). 04/2022 -03/2025. (DUE-2141814).
2. ACM SIGCSE Special Projects Award, *Dive into Systems - A Free Online Textbook for Introductory Computer Systems Topics*. Co-Investigator with Tia Newhall and Kevin Webb (Swarthmore College). \$5,000.000. 07/2019-07/2020.
3. National Science Foundation, *Collaborative Research: CSinParallel: Experiential Learning of Parallel and Distributed Computing Through Sight, Sound, and Touch*. PIs: Richard Brown (St. Olaf College), Joel Adams (Calvin College), Suzanne Matthews (West Point) \$595,131.00 (West Point's portion: \$58,710.00). 11/2018 -04/2022. (DUE-1855761).
4. U.S. Army Engineer Research and Development Center, *Increasing the Exposure of Parallel Computing at the United States Military Academy*, PI, \$246,252.00. 2016-2021.

5. Additional funding of \$75,000.00 received from ARDEC (Co-PI: Dr. Aaron St. Leger), 2016-2020
6. Computing Research Association, *Exploring MapReduce for Comparing Large Collections of Phylogenetic Trees*, Collaborative Research Experience for Undergraduates (CREU), PI, \$6,000, 2013.

Internal Funding

6. Army Research Labs, *Leveraging MapReduce for Anomaly Detection in Smart Grids*, ARL Faculty and Cadet Collaborative Research Program, Co-PI with Dr. Aaron St. Leger, \$3,149.00, 2016.
7. Army Research Labs, *Parallel Author Verification of E-mail*, ARL Faculty and Cadet Collaborative Research Program, PI, \$3,211.60, 2015.
8. Defense Advanced Research Projects Agency, *Leveraging MapReduce for Email Authorship Identification*, Undergraduate Research Opportunity Program (UROP), PI, \$1,000, 2014.

PUBLICATIONS

Books & Book Chapters

1. S. J. Matthews, T. Newhall, and K. Webb, *Dive into Systems*. No Starch Press, 1 ed., 6 2022. ISBN: 978-1718501362, 816 pages, In press. Free online version at <http://diveintosystems.org>
2. J. C. Adams, R. A. Brown, S. J. Matthews, E. Shoop, *et al.*, *PDC for Beginners*. Available Online, 1 ed., 1 2022. <https://dx.doi.org/10.55682/VXWY1300>, <https://www.learnpdc.org/PDCBeginners/>
3. S. J. Matthews, “Harnessing single board computers for military data analytics,” in *Military Applications of Data Analytics* (K. Huggins, ed.), ch. 4, pp. 63–77, CRC Press, Taylor & Francis, 2018

Peer-Reviewed Journal Articles¹

4. S. J. Matthews and A. St. Leger, “Leveraging mapreduce and synchrophasors for real-time anomaly detection in the smart grid,” *IEEE Transactions on Emerging Topics in Computing*, vol. 7, pp. 392–403, July 2019. 10.1109/TETC.2017.2694804, *First appeared online in IEEE Xplore in 2017*
5. J. C. Adams, S. J. Matthews, E. Shoop, D. Toth, and J. Wolfer, “Using inexpensive microclusters and accessible materials for cost-effective parallel and distributed computing education,” *Journal of Computational Science Education*, vol. 8, pp. 2–10, December 2017. 10.22369/issn.2153-4136/8/3/1
6. S. J. Matthews, “Using phoenix++ mapreduce to introduce undergraduate students to parallel computing,” *J. Comput. Sci. Coll.*, vol. 32, pp. 165–174, June 2017. <http://dl.acm.org/citation.cfm?id=3069658.3069682>
7. C. Chewar and S. J. Matthews, “Lights, camera, action!: Video deliverables for programming projects,” *J. Comput. Sci. Coll.*, vol. 31, pp. 8–17, Jan. 2016. <http://dl.acm.org/citation.cfm?id=2835377.2835380>
8. S. J. Matthews, “Teaching with parallella: A first look in an undergraduate parallel computing course,” *J. Comput. Sci. Coll.*, vol. 31, pp. 18–27, Jan. 2016. <http://dl.acm.org/citation.cfm?id=2835377.2835381>, **Best Paper, Award, CCSC Eastern 2015**
9. Z. J. Ramirez*, R. W. Blaine, and S. J. Matthews, “Augmenting the remotely operated automated mortar system with message passing,” *CrossTalk, The Journal of Defense Software Engineering*, vol. 28, no. 6, pp. 12–16, 2015
10. S. J. Matthews, “Heterogeneous compression of large collections of evolutionary trees,” *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, vol. 12, pp. 807–814, July 2015. <https://doi.org/10.1109/TCBB.2014.2366756>
11. V. Ramakrishnan, S. P. Srinivasan, S. M. Salem, S. J. Matthews, W. Colón, M. Zaki,

¹Matthews’ undergraduate research advisees noted with asterisk (*).

- and C. Bystroff, “Geofold: Topology-based protein unfolding pathways capture the effects of engineered disulfides on kinetic stability,” *Proteins: Structure, Function, and Bioinformatics*, vol. 80, no. 3, pp. 920–934, 2012. <http://dx.doi.org/10.1002/prot.23249>
12. S. J. Matthews and T. L. Williams, “An efficient and extensible approach for compressing phylogenetic trees,” *BMC Bioinformatics*, vol. 12, no. 10, p. S16, 2011. 10.1186/1471-2105-12-S10-S16, Also technical report No. 2011-5-2, Texas A&M University
 13. G. R. Brammer, R. W. Crosby, S. J. Matthews, and T. L. Williams, “Paper mâché: Creating dynamic reproducible science,” *Procedia Computer Science*, vol. 4, no. Supplement C, pp. 658 – 667, 2011. 10.1016/j.procs.2011.04.069, **Finalist in Elsevier Executable Paper Grand Challenge**
 14. S. J. Matthews and T. L. Williams, “MrsRF: an efficient mapreduce algorithm for analyzing large collections of evolutionary trees,” *BMC bioinformatics*, vol. 11, no. 1, p. S15, 2010. 10.1186/1471-2105-11-S1-S15, **Highly accessed.**
 15. S.-J. Sul, S. Matthews, and T. L. Williams, “Using tree diversity to compare phylogenetic heuristics,” *BMC bioinformatics*, vol. 10, no. 4, p. S3, 2009. 10.1186/1471-2105-10-S4-S3

Peer-Reviewed Conference Papers¹

16. J. C. Adams, R. Brown, S. J. Matthews, and E. Shoop, “Teaching pdc in the time of covid: Hands-on materials for remote learning,” in *2021 IEEE International Parallel and Distributed Processing Symposium Workshops (EduPar’21)*, pp. 342–349, 2021. 10.1109/IPDPSW52791.2021.00061
17. S. J. Matthews, T. Newhall, and K. C. Webb, “Dive into systems: A free, online textbook for introducing computer systems,” in *Proceedings of the 52nd ACM Technical Symposium on Computer Science Education, SIGCSE ’21*, (New York, NY, USA), p. 1110–1116, Association for Computing Machinery, 2021. 10.1145/3408877.3432514
18. S. J. Matthews and A. St. Leger, “Energy-efficient analysis of synchrophasor data using the nvidia jetson nano,” in *2020 IEEE High Performance Extreme Computing Conference (HPEC)*, pp. 1–7, 2020. 10.1109/HPEC43674.2020.9286226
19. D. Hawthorne, M. Kapralos, R. Blaine, and S. J. Matthews, “Evaluating cryptographic performance of raspberry pi clusters,” in *2020 IEEE High Performance Extreme Computing Conference (HPEC)*, pp. 1–9, 2020. 10.1109/HPEC43674.2020.9286247
20. S. Oh*, N. Stickney, D. Hawthorne, and S. J. Matthews, “Teaching web-attacks on a raspberry pi cyber range,” in *Proceedings of the 21st Annual SIG Conference on Information Technology Education, SIGITE ’20*, (New York, NY, USA), ACM, 2020. 10.1145/3368308.3415364
21. S. J. Matthews, “PDCunplugged: A free repository of unplugged parallel distributed computing activities,” in *2020 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW)*, pp. 284–291, 2020. 10.1109/IPDPSW50202.2020.00060, **Best Paper Award, EduPar’20**
22. C. Johnson*, B. Curtin*, N. Shyamkumar*, R. David*, E. Dunham*, P. Haney, H. Moore, T. A. Babitt, and S. J. Matthews, “A raspberry pi mesh sensor network for portable perimeter security,” in *2019 IEEE 10th Annual Ubiquitous Computing, Electronics Mobile Communication Conference (UEMCON)*, pp. 0001–0007, Oct 2019. 10.1109/UEMCON47517.2019.8993000
23. B. Curtin* and S. J. Matthews, “Deep learning for inexpensive image classification of wildlife on the raspberry pi,” in *2019 IEEE 10th Annual Ubiquitous Computing, Electronics Mobile Communication Conference (UEMCON)*, pp. 0082–0087, Oct 2019. 10.1109/UEMCON47517.2019.8993061
24. O.-G. Baciu-Ureche*, C. Sleeman*, W. C. Moody, and S. J. Matthews, “The adventures of scriptkitty: Using the raspberry pi to teach adolescents about internet safety,” in *Proceedings of the 20th Annual SIG Conference on Information Technology Education, SIGITE ’19*, (New York, NY, USA), pp. 118–123, ACM, 2019.

- 10.1145/3349266.3351399
25. S. Drakontaidis*, M. Stanchi*, G. Glazer*, J. Hussey, A. S. Leger, and S. J. Matthews, "Towards energy-proportional anomaly detection in the smart grid," in *2018 IEEE High Performance Extreme Computing Conference (HPEC)*, pp. 1–7, Sept 2018. 10.1109/HPEC.2018.8547695
 26. S. J. Matthews, J. C. Adams, R. A. Brown, and E. Shoop, "Portable parallel computing with the raspberry pi," in *Proceedings of the 49th ACM Technical Symposium on Computer Science Education, SIGCSE '18*, (New York, NY, USA), pp. 92–97, ACM, 2018. 10.1145/3159450.3159558
 27. S. J. Matthews and A. St. Leger, "Leveraging single board computers for anomaly detection in the smart grid," in *2017 IEEE 8th Annual Ubiquitous Computing, Electronics and Mobile Communication Conference (UEMCON)*, pp. 437–443, Oct 2017. 10.1109/UEMCON.2017.8249031, **Best Paper Award**
 28. S. Deaton*, D. Brownfield*, L. Kosta*, Z. Zhu*, and S. J. Matthews, "Real-time regex matching with apache spark," in *2017 IEEE High Performance Extreme Computing Conference (HPEC)*, pp. 1–6, Sept 2017. 10.1109/HPEC.2017.8091063
 29. L. Kosta*, H. Hunter, G. George, A. Strelzoff, and S. J. Matthews, "Measuring I/O performance of lustre and the temporary file system for tradespace applications on hpc systems," in *Proceedings of the ACM SouthEast Conference, ACM SE '17*, (New York, NY, USA), pp. 187–190, ACM, 2017. 10.1145/3077286.3077326
 30. S. J. Matthews, R. W. Blaine, and A. F. Brantly, "Evaluating single board computer clusters for cyber operations," in *2016 International Conference on Cyber Conflict (CyCon U.S.)*, pp. 1–8, Oct 2016. 10.1109/CYCONUS.2016.7836622
 31. S. J. Matthews, "Accurate simulation of large collections of phylogenetic trees," in *2015 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, pp. 113–118, Nov 2015. 10.1109/BIBM.2015.7359665
 32. J. Hannigan*, S. J. Matthews, J. K. Wickiser, and P. Shakarian, "A network-based approach for identifying cancer causing pathogens," in *Proceedings of the 2014 ACM Southeast Regional Conference, ACM SE '14*, pp. 56:1–56:5, 2014. <http://doi.acm.org/10.1145/2638404.2735459>
 33. B. Tyson*, R. Betros*, N. Rollings*, J. Figueroa-Cecco*, L. Jones*, and S. J. Matthews, "Using mapreduce to compare large collections of phylogenetic trees," in *Proceedings of the 2014 ACM Southeast Regional Conference, ACM SE '14*, pp. 57:1–57:5, 2014. <http://doi.acm.org/10.1145/2638404.2735460>
 34. S. Matthews, S.-J. Sul, and T. L. Williams, "A novel approach for compressing phylogenetic trees.," in *Bioinformatics Research and Applications ISBRA 2010*, Lecture Notes in Computer Science, pp. 113–124, Springer, 2010. 10.1007/978-3-642-13078-6.13
 35. S. J. Sul, S. Matthews, and T. L. Williams, "New approaches to compare phylogenetic search heuristics," in *2008 IEEE International Conference on Bioinformatics and Biomedicine*, pp. 239–245, Nov 2008. 10.1109/BIBM.2008.81

Peer-Reviewed Computer Science Education Special Session Papers

36. J. C. Adams, J. Caswell, S. J. Matthews, C. Peck, E. Shoop, D. Toth, and J. Wolfer, "The micro-cluster showcase: 7 inexpensive beowulf clusters for teaching pdc," in *Proceedings of the 47th ACM Technical Symposium on Computing Science Education, SIGCSE '16*, pp. 82–83, ACM, 2016. <http://doi.acm.org/10.1145/2839509.2844670>
37. J. C. Adams, J. Caswell, S. J. Matthews, C. Peck, E. Shoop, and D. Toth, "Budget beowulfs: A showcase of inexpensive clusters for teaching pdc," in *Proceedings of the 46th ACM Technical Symposium on Computer Science Education, SIGCSE '15*, pp. 344–345, ACM, 2015. <http://doi.acm.org/10.1145/2676723.2677317>
38. N. Parlante, J. Zelenski, P.-M. Osera, M. Stepp, M. Sherriff, L. Tychonievich, R. Layer, S. J. Matthews, A. Obourn, D. R. Raymond, J. Hug, and S. Reges, "Nifty assignments," in *Proceedings of the 46th ACM Technical Symposium on Computer Science*

Education, SIGCSE '15, pp. 673–674, ACM, 2015. <http://doi.acm.org/10.1145/2676723.2677327>

Peer-Reviewed Undergraduate Conference Papers¹

39. D. K. Andrews*, R. K. Agrawal, S. J. Matthews, and A. S. Mentis, “Comparing machine learning techniques for zeek log analysis,” in *2019 IEEE MIT Undergraduate Research Technology Conference (URTC)*, pp. 1–4, Oct 2019. 10.1109/URTC49097.2019.9660501
40. K. Candelario*, C. Booth*, A. St. Leger, and S. J. Matthews, “Investigating a raspberry pi cluster for detecting anomalies in the smart grid,” in *2017 IEEE MIT Undergraduate Research Technology Conference (URTC)*, pp. 1–4, Nov 2017. 10.1109/URTC.2017.8284197, **Best Paper Award**
41. J. Yan* and S. J. Matthews, “Applying clustering algorithms to determine authorship of chinese twitter messages,” in *2016 IEEE MIT Undergraduate Research Technology Conference (URTC)*, pp. 1–4, Nov 2016. 10.1109/URTC.2016.8361150
42. T. Nosco*, L. Jones*, J. Smola*, J. Lass*, J. Bell, W. Pulleyblank, S. J. Matthews, and C. Okasaki, “Exploring the oriented graceful labeling conjecture on lobster trees,” in *Proceedings of the National Council of Undergraduate Research*, NCUR, National Council on Undergraduate Education, 2016
43. C. Hwang*, M. Parros*, J. Russell*, D. Chamberlen*, J. Spruce, A. St. Leger, and S. J. Matthews, “Using mapreduce to detect anomalies in the real-time smart grid,” in *Proceedings of the National Council of Undergraduate Research*, NCUR, National Council on Undergraduate Education, 2016

Technical Reports & Invited Publications¹

44. S. Deaton*, S. Hutchison, and S. J. Matthews, “Using machine learning to predict the popularity of reddit comments,” *HPC Insights Magazine (Winter 2018)*, 2017. Available at: <https://www.hpc.mil/2013-08-29-16-06-21/publications/hpc-insights>
45. L. St. Amour*, F. Ulrich*, A. Kellas*, A. Molnar*, and S. J. Matthews, “Pave: Write-print creation with mapreduce,” Technical Report AD1005367, Defense Technical Information Center, Army Research Labs, 2015

Dissertation & Thesis

46. S. J. Matthews, *Efficient Algorithms for Comparing, Storing, and Sharing Large Collections of Evolutionary Trees*. PhD thesis, Department of Computer Science & Engineering, Texas A&M University, College Station, TX, 2012
47. S. J. Matthews, “Visualizing pathways: An exploration of the protein unfolding process,” Master’s thesis, Department of Computer Science, Rensselaer Polytechnic Institute, Troy, NY, 2008

PRESENTATIONS

Peer-Reviewed Posters and Presentations¹

1. D. Gourdine* and S. J. Matthews, “Learning ARM assembly through a binary game and Dive into Systems.” Consortium for Computing Science in Colleges - Northeastern Region (CCSC NE’22) Undergraduate Research Competition, Pleasantville, NY. Abstract available online: <http://ccscne.org/wp-content/uploads/2022/04/CCSCNE-2022-Student-Posters-Final.pdf>, April 2022
2. B. H. Curtin*, R. H. David*, E. D. Dunham*, C. D. Johnson*, N. Shyamkumar*, T. A. Babbitt, and S. J. Matthews, “Designing a raspberry pi sensor network for remote observation of wildlife,” in *Proceedings of the 6th Annual Symposium on Hot Topics in the Science of Security*, HotSoS '19, (New York, NY, USA), pp. 17:1–17:2, ACM, 2019. 10.1145/3314058.3317293, Poster, 2-page abstract appears in proceedings
3. D. Andrews*, J. Behn*, D. Jaksha*, J. Seo*, M. Schneider*, J. Yoon*, S. J. Matthews, R. Agrawal, and A. S. Mentis, “Exploring rnnns for analyzing zeek http data,” in *Proceedings of the 6th Annual Symposium on Hot Topics in the Science of Security*, Hot-

- SoS '19, (New York, NY, USA), pp. 18:1–18:2, ACM, 2019. 10.1145/3314058.3317291, Poster, 2-page abstract appears in proceedings
4. O.-G. Baciureche*, C. Sleeman*, K. Scott*, W. Moody, and S. J. Matthews, “The adventures of scriptkitty: Teaching middle school students cyber awareness with comics on the raspberry pi,” in *Proceedings of the 50th ACM Technical Symposium on Computer Science Education*, SIGCSE '19, (New York, NY, USA), pp. 1294–1294, ACM, 2019. 10.1145/3287324.3293702, ACM Student Research Competition poster
 5. N. Shopov*, M. Jeong*, E. Rude*, B. Nesaralla*, S. Hutchison, A. Mentis, and S. J. Matthews, “Investigating tensorflow for airport facial identification: Poster,” in *Proceedings of the 5th Annual Symposium and Bootcamp on Hot Topics in the Science of Security*, HoTSoS '18, pp. 23:1–23:1, ACM, April 2018. 10.1145/3190619.3191692
 6. S. Drakontaidis*, M. Stanchi*, G. Glazer*, A. Davis*, M. Stark*, C. Clay*, J. Hussey, N. Barry, A. S. Leger, and S. J. Matthews, “Integrating historical and real-time anomaly detection to create a more resilient smart grid architecture: Poster,” in *Proceedings of the 5th Annual Symposium and Bootcamp on Hot Topics in the Science of Security*, HoTSoS '18, pp. 22:1–22:1, ACM, April 2018. 10.1145/3190619.3191683
 7. A. Alejos*, M. Ball*, C. Eckert*, M. Ma*, H. Ward*, P. Hanlon, and S. J. Matthews, “Exploring the raspberry pi for data summarization in wireless sensor networks: Poster,” in *Proceedings of the 5th Annual Symposium and Bootcamp on Hot Topics in the Science of Security*, HoTSoS '18, pp. 18:1–18:1, ACM, April 2018. 10.1145/3190619.3191679
 8. D. Brownfield*, S. Deaton*, L. Kosta*, Z. Zhu*, and S. J. Matthews, “Leveraging apache spark for real-time regex matching on bro log data.” Consortium for Computing Science in Colleges - Northeastern Region (CCSC NE'17) Undergraduate Research Competition, **Best Poster**, Albany NY (Also won 4th place at HPC Day in Dartmouth MA in May 2017), April 2017
 9. J. Lee*, A. Lacey*, Z. Panto*, M. Jenkins*, and S. J. Matthews, “A k-means approach for attributing the authorship of anonymous e-mail.” National Conference on Undergraduate Research (NCUR'16), Asheville NC, April 2016
 10. S. Horras*, R. Gerber, and S. J. Matthews, “Investigating job configuration efficiency on hpc resources at NERSC.” National Conference on Undergraduate Research (NCUR'15), Cheney WA, April 2015
 11. A. Kellas*, A. Molnar*, L. St. Amour*, F. Ulrich*, and S. J. Matthews, “Parallel author verification of e-mail (abstract only),” in *Proceedings of the 46th ACM Technical Symposium on Computer Science Education*, SIGCSE '15, pp. 717–717, ACM, March 2015. 10.1145/2676723.2693634, ACM Student Research Competition
 12. L. Jones*, R. Betros*, B. Tyson*, N. Rollings*, J. Figueroa-Cecco*, and S. J. Matthews, “Using mapreduce to compare large collections of evolutionary trees.” 2014 Grace Hopper Celebration of Women in Computing (GHC'14), Phoenix AZ, October 2014
 13. J. Hannigan*, S. J. Matthews, J. K. Wickiser, and P. Shakarian, “Leveraging host protein network topology to identify cancer causing pathogens.” ACM Student Research Competition, 2014 ACM Richard Tapia Conference, Seattle WA, **Best Poster** (Also awarded Best Poster at the 2013 USMA Network Science Poster Competition, May 2013), February 2014
 14. S. J. Matthews and T. L. Williams, “An efficient and extensible approach for compressing phylogenetic trees.” Eight annual conference of the midsouth computational biology and bioinformatics society (MCBIOS'11) **First Place**, April 2011
 15. S. J. Matthews, S.-J. Sul, and T. L. Williams, “Effective phylogenetic compression with treezip.” Informatics for Phylogenetics, Evolution, and Biodiversity (iEvoBio'10), Portland OR, Available from Nature Precedings: <http://hdl.handle.net/10101/npre.2010.4613.1>, June 2010
 16. S. J. Matthews, S. J. Sul, and T. L. Williams, “Treezip: A new algorithm for compressing large collections of evolutionary trees,” in *2010 Data Compression Conference*, pp. 544–544, March 2010. 10.1109/DCC.2010.64

17. A. Dal-Molin, S. J. Matthews, S.-J. Sul, J. Munro, J. Woolley, T. Heraty, and T. L. Williams, “Large datasets, large sets of trees, and how many brains? – visualization and comparison of phylogenetic hypotheses inferred from rdna in chalcidoidea (hymenoptera).” Entomological Society of America (ESA) Annual Meeting: Student Competition for the President’s Prize, Indianapolis IN, December 2009
18. S. J. Matthews, S.-J. Sul, and T. L. Williams, “Using mapreduce for evolutionary trees on multicore platforms.” ACM Student Research Competition, 2009 ACM Richard Tapia Conference, Portland OR, April 2009

Peer-Reviewed Conference Panels, BOF, & Workshops

19. E. Shoop, R. Brown, J. Adams, and S. Matthews, “Teaching distributed computing fundamentals using raspberry pi clusters,” in *Proceedings of the 53rd ACM Technical Symposium on Computer Science Education V. 2*, SIGCSE 2022, (New York, NY, USA), p. 1201, ACM, 2022. 10.1145/3478432.3499161, (Workshop)
20. S. J. Matthews, M. Chris, R. H. Arpaci-Dusseau, and K. C. Webb, “Textbooksforall: Free textbooks and their place in computer science education,” in *Proceedings of the 52nd ACM Technical Symposium on Computer Science Education*, SIGCSE ’21, 2021. (Panel)
21. J. C. Adams, R. Brown, S. J. Matthews, and E. Shoop, “Teaching parallel and distributed computing in the time of covid,” in *Proceedings of the 52nd ACM Technical Symposium on Computer Science Education*, SIGCSE ’21, 2021. (Birds of a Feather)
22. S. J. Matthews, J. C. Adams, R. Brown, and E. Shoop, “Incorporating parallel computing in the undergraduate computer science curriculum,” in *Proceedings of the 51st ACM Technical Symposium on Computer Science Education*, SIGCSE ’20, (New York, NY, USA), p. 1399, ACM, 2020. 10.1145/3328778.3372511, (Birds of a Feather)
23. E. Shoop, J. C. Adams, R. Brown, and S. J. Matthews, “Introducing beginners to distributed computing using raspberry pi clusters,” in *Proceedings of the 51st ACM Technical Symposium on Computer Science Education*, SIGCSE ’20, (New York, NY, USA), p. 1388, ACM, 2020. 10.1145/3328778.3367004, (Workshop)
24. S. J. Matthews, J. C. Adams, R. A. Brown, and E. Shoop, “Exploring parallel computing with openmp on the raspberry pi,” in *Proceedings of the 50th ACM Technical Symposium on Computer Science Education*, SIGCSE ’19, (New York, NY, USA), pp. 1234–1234, ACM, 2019. 10.1145/3287324.3287535, (Workshop)
25. J. C. Adams, R. A. Brown, J. Kawash, S. J. Matthews, and E. Shoop, “Leveraging the raspberry pi for cs education,” in *Proceedings of the 49th ACM Technical Symposium on Computer Science Education*, SIGCSE ’18, pp. 814–815, ACM, February 2018. 10.1145/3159450.3159611, (Panel)
26. R. Brown, J. Adams, S. Matthews, and E. Shoop, “Teaching parallel and distributed computing with mpi on raspberry pi clusters: (abstract only),” in *Proceedings of the 49th ACM Technical Symposium on Computer Science Education*, SIGCSE ’18, pp. 1054–1054, ACM, February 2018. 10.1145/3159450.3162369, (Workshop)
27. S. J. Matthews, J. C. Adams, R. Brown, and E. Shoop, “Teaching parallel computing with OpenMP on the raspberry pi (abstract only),” in *Proceedings of the 2017 ACM SIGCSE Technical Symposium on Computer Science Education*, SIGCSE ’17, pp. 741–741, ACM, March 2017. 10.1145/3017680.3017818, (Workshop)
28. F. Rahman, S. Matthews, K. Shaw, and A. Danyluk, “Can we really do it?: Conducting significant computer science research in primarily undergraduate institutions (PUIs) (abstract only),” in *Proceedings of the 2017 ACM SIGCSE Technical Symposium on Computer Science Education*, SIGCSE ’17, pp. 729–729, ACM, March 2017. 10.1145/3017680.3022347, (Birds of a Feather)
29. S. J. Matthews, B. H. Marshall, J. Walter, and T. L. Williams, “Cultivating more women in academia.” 2016 Grace Hopper Celebration of Women in Computing, Houston TX (Panel), October 2016
30. S. J. Matthews, R. A. Brown, J. C. Adams, and E. Shoop, “Parallel computing with

- OpenMP on the raspberry pi 2.” 2016 ACM Richard Tapia Conference (Tapia’16), Austin TX (Workshop), September 2016
31. S. J. Matthews, L. Tapia, N. Amato, and E. Walker, “Navigating the academic job search.” 2013 Grace Hopper Celebration of Women in Computing, Minneapolis MN (Panel), October 2013
 32. D. Cummings, S. J. Matthews, P. Taelle, N. Bowers, and D. Eberly, “Fake it till you make it: Overcoming imposter syndrome.” 2013 ACM Richard Tapia Celebration of Diversity in Computing Conference, Washington DC (Panel), February 2013
 33. S. J. Matthews, D. Cummings, C. Lively, A. Davis, and V. Taylor, “Faking it: Overcoming imposter syndrome.” 2011 ACM Richard Tapia Celebration of Diversity in Computing Conference, San Francisco CA (Panel), April 2011
 34. L. Tapia, C. Lively, and S. J. Matthews, “Steps to a phd: A student’s perspective.” 2009 ACM Richard Tapia Celebration of Diversity in Computing Conference, Portland OR (Panel), April 2009

Other Invited Talks/Panels (Internal)

35. “Dean’s Faculty Research Panel”, United States Military Academy, May 3, 2018. With John Hartke, Dom Larkin, Daniel Milton and Enoch Nagelli.
36. S. J. Matthews, “The case for energy proportional data analysis.” Cyber Research Center Brownbag Series, West Point NY, August 2018
37. S. J. Matthews, “Why YOU should care about parallel computing: using HPC to solve problems of critical mass.” HPC Brown Bag Series, West Point NY, December 2017
38. S. J. Matthews, “Parallelizing data science applications of critical mass.” Network Science Center Brown Bag Series, West Point NY, February 2016
39. S. J. Matthews, “The gist of it: Confidential advice for women & minorities in STEM.” Society of Women Engineers USMA Chapter Luncheon, West Point NY, January 2016
40. “Published Authors’ Night”, United States Military Academy Prep School, August 27, 2015. With Remi Hajjar, Ruth Beitler, Gerard McGowan, and Anthony Johnson.
41. “Published Authors’ Night”, United States Military Academy Prep School, November 5, 2014. With Cindy Jebb, Marc Napolitano, Don Outing, and Remi Hajjar.

SERVICE ACTIVITIES

Professional Service

- o Position Papers and Curriculum Reports Program Committee, ACM SIGCSE (2021)
- o Program Committee, EduPar (2020)
- o Research Papers Program Committee, ACM SIGCSE (2019)
- o Experiential Reports & Tools Program Committee, ACM SIGCSE (2020, 2018)
- o Lightning Talk Program Committee, ACM SIGCSE (2018, 2017)
- o Program Committee, EduHPC Workshop (2016)
- o Scholarship Committee, ACM Richard Tapia Celebration of Diversity in Computing (2016, 2015, 2014, 2013)
- o Medical-Technology Track Program Committee, Grace Hopper Celebration (2013)

Academy Service

- o USMA Academic Freedom Advisory Committee, 2017 - Present
- o USMA Academic Research Council, AY2019
- o USMA Dean’s Service Award Subcommittee member, 2016, 2017
- o USMA Faculty Manual Committee (Formerly Rules Committee), 2015

Department Service

- o EECS Excellence in Teaching Award Committee, 2013, 2017, 2018, 2019
- o Title 10 Hiring Committee, 2016, 2019, 2020
- o 2014 CSG Lead Hiring Committee

- CS Program Steering Committee, 2014 - Present
- Trip Section OIC, GHC'12, GHC'13, Tapia'13, Tapia'14, SIGCSE'15, EECS Systems Luncheon (2012-Present)
- Trip Section Co-OIC, GHC'14, GHC'15, GHC'16, GHC'17, GHC'18, GHC'19, EECS Systems Luncheon (02/26/15)
- IT105 Tech Tour (CS Program Rep.), 2013-2019
- 2014 EECS ABET Self-Study Chapter Author and PI Writer. Co-wrote initial draft of Chapter 6 of CS Self Study; assessed courses for various PIs.
- Lock-O duty training officer, Summer 2013
- Assistant Academic Officer in Charge, Study Tour Duty (10/28/12)

Professional Development

- Invited Participant, NSF Institute Planning Workshop for Parallel and Distributed Computing Education (SIGCSE'20), 03/2020
- Resident, HERS Leadership Institute (Luce Program), University of Denver, 06/2018
- Invited Participant, CSinParallel Workshop, 08/2014
- USMA Master Teaching Program, 2012-2014
- Attendee, NSF Grant Writing Workshop - Rutgers University, 08/2013
- Invited Participant, CRA-W Career Mentoring Workshop (CMW-E), 03/2013
- EECS Faculty Development Workshop, 07-08/2012
- Invited Participant, NSF ADVANCE NIFP workshop, Rice University, 09/2011
- Invited Participant, CRA-W Grad Cohort (2008, 2009, 2010)

Other Conference/Journal Submission Reviewer

SIGCSE (2014-2016); TCBB (2019); SIGITE (2019); TOE (2017); TETC (2016); TPDS (2015); Systematic Biology (2012); MCBIOS'12; ISBRA'11; iEvoBio'11

Professional Memberships

Member, Association for Computing Machinery
 Affiliate, IEEE Computer Society

2007 - Present
 August 2014 - Present