

Boris Krämer

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Department of Mechanical and Aerospace Engineering
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RESEARCH INTERESTS

- Reduced-order modeling of large-scale complex systems
- Data-driven modeling and system identification
- Reliability-based and risk-based design optimization
- Optimal control for large-scale dynamical systems
- Multifidelity uncertainty quantification
- Numerical linear algebra and scientific computing
- Partial differential equations models

EMPLOYMENT

Assistant Professor (tenure-track) (Sep. 2019–present)
Department of Mechanical and Aerospace Engineering
University of California San Diego, La Jolla, CA

Postdoctoral Research Associate (Sep. 2015–Aug. 2019)
Department of Aeronautics & Astronautics, and Aerospace Computational Design Lab (ACDL)
Massachusetts Institute of Technology, Cambridge, MA
Advisor: Karen E. Willcox

Research Internship (Sep. 2014–Apr. 2015)
Mechatronics and Multimedia Group
Mitsubishi Electric Research Laboratory, Cambridge, MA

EDUCATION

Ph.D. in Mathematics (Aug. 2015)
Thesis: *Model and Data Reduction for Control, Identification and Compressed Sensing* (Advisor: John Burns)
Department of Mathematics and Interdisciplinary Center for Applied Mathematics (ICAM)
Virginia Tech, Blacksburg, VA

M.Sc. in Mathematics (Aug. 2011)
Department of Mathematics and Interdisciplinary Center for Applied Mathematics (ICAM)
Virginia Tech, Blacksburg, VA

Cand. Dipl. Math. Tech (Pre-Diploma in Techno-Mathematics) (Jul. 2009)
Department of Mathematics
Karlsruhe Institute of Technology (KIT), Germany

JOURNAL PUBLICATIONS

17. P. Benner, P. Goyal, B. Kramer, B. Peherstorfer, K. Willcox. *Operator inference for non-intrusive model reduction of systems with non-polynomial nonlinear terms*. Preprint available at <http://arxiv.org/abs/2002.09726>.
16. B. Kramer and K. Willcox. *Balanced Truncation Model Reduction for Lifted Nonlinear Systems*. Preprint available at <https://arxiv.org/abs/1907.12084>.

15. R. Swischuk, B. Kramer, C. Huang, and K. Willcox. *Learning physics-based reduced-order models for a single-injector combustion process*. AIAA Journal, 58:6, 2658–2672, 2020 <https://doi.org/10.2514/1.J058943>.
14. M. Heinkenschloss, B. Kramer, T. Takhtaganov. *Adaptive reduced-order model construction for conditional value-at-risk estimation*. SIAM/ASA J. Uncertainty Quantification, 8(2), 668–692, 2020. <https://doi.org/10.1137/19M1257433>.
13. E. Qian, B. Kramer, B. Peherstorfer, K. Willcox. *Lift & Learn: Physics-informed machine learning for large-scale nonlinear dynamical systems*. Physica D: Nonlinear Phenomena, Volume 406, p. 132401, 2020. <https://doi.org/10.1016/j.physd.2020.132401> and <http://arxiv.org/abs/1912.08177>.
12. A. Chaudhuri, B. Kramer and K. Willcox. *Information reuse for importance sampling in reliability-based design optimization*. Reliability Engineering & System Safety, Volume 201, p. 106853, 2020. <https://doi.org/10.1016/j.res.2020.106853>. [This work was mentioned in the AIAA Aerospace America Magazine [read article](#)]
11. B. Kramer and K. Willcox. *Nonlinear model order reduction via lifting transformations and proper orthogonal decomposition*. AIAA Journal, 57:6, 2297–2307, 2019. <https://doi.org/10.2514/1.J057791>.
10. B. Kramer, B. Peherstorfer, A. Marques, U. Villa, K. Willcox. *Multifidelity probability estimation via fusion of estimators*. Journal of Computational Physics, 392: 385–402, 2019. <https://doi.org/10.1016/j.jcp.2019.04.071>; arxiv.org/abs/1905.02679
9. M. Heinkenschloss, B. Kramer, T. Takhtaganov, K. Willcox. *Conditional-Value-at-Risk estimation via Reduced-Order Models*. SIAM/ASA J. Uncertainty Quantification, 6(4), 1395–1423, 2018. <https://doi.org/10.1137/17M1160069>. [top-20 downloaded SIAM JUQ paper over past 12 month, as of 08/21/2019]
8. B. Peherstorfer, B. Kramer and K. Willcox. *Multifidelity preconditioning of the cross-entropy method for rare event simulation and failure probability estimation*. SIAM/ASA J. Uncertainty Quantification, 6(2), 737–761, 2018. <https://doi.org/10.1137/17M1122992>. [top-20 downloaded SIAM JUQ paper over past 12 month, as of 06/19/2019]
7. B. Kramer and A. Gorodetsky. *System identification via CUR-factored Hankel approximation*. SIAM J. Scientific Computing 40(2), pp. 848–866, 2018. <https://doi.org/10.1137/17M1137632>.
6. B. Kramer, B. Peherstorfer and K. Willcox. *Feedback control for systems with uncertain parameters using online-adaptive reduced models*. SIAM J. Applied Dynamical Systems 16(3), pp. 1563–1586, 2017. <https://doi.org/10.1137/16M1088958>.
5. B. Kramer, P. Grover, P. Boufounos, M. Benosman, S. Nabi. *Sparse sensing and DMD based identification of flow regimes and bifurcations in complex flows*. SIAM J. Applied Dynamical Systems, 16(2), pp. 1164–1196, 2017. <https://doi.org/10.1137/15M104565X>.
4. M. Benosman, J. Borggaard, O. San and B. Kramer. *Learning-based Robust Stabilization for Reduced-Order Models of 2D and 3D Boussinesq Equations*. Applied Mathematical Modelling, Vol. 49, pp. 162–181, 2017. <https://doi.org/10.1016/j.apm.2017.04.032>.
3. B. Peherstorfer, B. Kramer and K. Willcox. *Combining multiple surrogate models to accelerate failure probability estimation with expensive high-fidelity models*. Journal of Computational Physics, 341:61–75, 2017. <https://doi.org/10.1016/j.jcp.2017.04.012>.
2. B. Kramer and J.R. Singler. *A POD projection method for large-scale algebraic Riccati equations*. Numerical Algebra, Control and Optimization, 6(4), pp. 413–435, 2016. <https://doi.org/10.3934/naco.2016018>.
1. B. Kramer and S. Gugercin. *Tangential interpolation-based eigensystem realization algorithm for MIMO systems*. Mathematical and Computer Modelling of Dynamical Systems, 22(4), pp. 282–306, 2016. <https://doi.org/10.1080/13873954.2016.1198389>.

REFEREED CONFERENCE PROCEEDINGS

8. A. Chaudhuri, B. Kramer, M. Norton. *Risk-based design optimization via probability of failure, conditional value-at-risk, and buffered probability of failure* AIAA SciTech 2020 Forum, January 2020. <https://doi.org/10.2514/6.2020-2130>.
7. R. Swischuk, B. Kramer, C. Huang, and K. Willcox. *Learning physics-based reduced-order models for a single-injector combustion process*. AIAA SciTech 2020 Forum, January 2020. <https://doi.org/10.2514/6.2020-1411>.
6. E. Qian, B. Kramer, A. N. Marques, K. E. Willcox. *Transform & Learn: A data-driven approach to nonlinear model reduction*. AIAA Aviation 2019 Forum, June 2019. <https://doi.org/10.2514/6.2019-3707>.
5. B. Kramer. *Solving algebraic Riccati equations via proper orthogonal decomposition*. 19th IFAC World Congress, 2014. pp. 7767–7772. <https://doi.org/10.3182/20140824-6-ZA-1003.02477>. [Acceptance Rate 76%].
4. J.A. Burns and B. Kramer. *Full flux models for optimization and control of heat exchangers*. American Control Conference, 2015, pp. 577–582. <https://doi.org/10.1109/ACC.2015.7170797>. [Acceptance Rate 63%].
3. M. Benosman, B. Kramer, P. Grover, P. Boufounos. *Learning-based reduced-order model stabilization for partial differential equations: Application to the coupled Burgers' equation*. American Control Conference, 2016, pp. 1673–1678. <https://doi.org/10.1109/ACC.2016.7525157>. [Acceptance Rate 68%].
2. B. Kramer. *Model reduction for control of a multiphysics system: Coupled Burgers' equation*. American Control Conference, 2016, pp. 6146–6151. <https://doi.org/10.1109/ACC.2016.7526635>. [Acceptance Rate 68%].
1. M. Benosman, J. Borggaard and B. Kramer. *Robust POD model stabilization for the 3D Boussinesq equations based on Lyapunov theory and extremum seeking*. American Control Conference, 2017, pp. 1827–1832. <https://doi.org/10.23919/ACC.2017.7963218>. [Acceptance Rate 66%].

PATENTS

2. M. Benosman, P. Boufounos, B. Kramer, P. Grover, *System and Method for Controlling Operations of Air-Conditioning System*. US Patent 9976765B2, Filed Mar 6, 2015, granted May 22, 2018.
1. P. Boufounos, P. Grover, B. Kramer, M. Benosman, *System and Method for Controlling Operations of Air-Conditioning System*. US Patent 10145576B2, Filed May 18, 2015, granted December 4, 2018.

THESIS

1. B. Kramer, Model and Data Reduction for Control, Identification and Compressed Sensing. Ph.D. thesis, August 2015. Available at <http://hdl.handle.net/10919/75179>.
2. B. Kramer, Model Reduction of the Coupled Burgers Equation in Conservation Form. M.Sc. thesis, August 2011. Available at <http://hdl.handle.net/10919/34791>.

MEDIA COVERAGE

1. [Scientific Machine Learning Paves Way for Rapid Rocket Engine Design](#) (UT News, 04/16/2020)
2. [A Faster Way to Design Rockets: Scientific Machine Learning](#) (Tech Briefs, 04/16/2020)
3. [Scientific machine learning paves way for rapid rocket engine design](#) (Science Daily,04/16/2020)
4. [Researchers advance probabilistic analysis for greater efficiency and safety](#) (AIAA Aerospace America Magazine, 12/2019)

FUNDING

1. National Science Foundation Grant 2004275, *SBIR Phase I: Human-Centered, Augmented Intelligence Software for Water and Wastewater*, Confluency LLC, Chicago, \$224,936, 07/01/2020–06/30/2021. Sub-award to UCSD: 07/01/2020-12/31/2020 for \$33,108. [\[link\]](#)

HONORS AND AWARDS

- **SIAM Travel Awards** for conferences: CSE'13 Boston, AN'14 Chicago, CSE'15 Salt Lake City.
- **SIAM Certificate of Recognition** for exceptional service to the Virginia Tech SIAM student chapter, 2014.
- **Hatcher Foundation Fellowship** for summer term funding, Virginia Tech, 2011–2015.
- **Gene Golub Summer School Travel Grant** from NSF and SIAM, 2013.
- **German Physical Society (DPG) Award** for excellent performance during A-levels, 2007.

TEACHING

University of California San Diego, Department of Mechanical and Aerospace Engineering

- MAE 207: Model Reduction, Spring 2020.
- MAE 143A: Signals & Systems, Winter 2020.

Virginia Tech, Department of Mathematics

- MATH 2214: Introduction to Differential Equations, Spring 2014
- MATH 1205: Calculus I—Differential Calculus, Fall 2013
- MATH 1224: Vector Geometry, Spring 2012

Graduate-Undergraduate Mentoring Program (Virginia Tech)

- Introduced undergraduate students to life in graduate school through regular meetings and shadowing
- Helped with and discussed academic career choices and raised interest in graduate school

INVITED TALKS/SEMINARS

18. *Operator inference for non-polynomial systems and control applications*. ICERM Workshop on Mathematics of Reduced Order Models, Brown University, RI, Feb 17–21, 2020.
17. *LQR control for systems with uncertain parameters via online-adaptive reduced models*. Workshop on Feedback Control, Johann-Radon Institute for Computational and Applied Mathematics (RICAM), JKU Linz, Austria, November 29, 2019.
16. *Lifting transformations for dynamical systems and model reduction*. Kolchin Seminar in Differential Algebra, Joint CUNY and NYU seminar, November 16, 2018.
15. *Nonlinear model reduction for complex systems*. Aerospace Computational Design Labs seminar, Department of Aeronautics and Astronautics, MIT, Cambridge, MA, November 9, 2018.
14. *Nonlinear model reduction for complex systems*. Department of Mechanical Engineering Colloquium, University of Washington, Seattle, WA, November 6, 2018.
13. *Conditional-value-at-risk estimation with reduced-order models*. Computational and Applied Math Seminar, Tufts University, Boston, MA, April 23, 2018.
12. *Risk measure estimation with reduced-order models*. Aerospace Computational Design Labs seminar, Department of Aeronautics and Astronautics, MIT, Cambridge, MA, March 2, 2018.
11. *Reduced-order models for data-driven modeling and uncertainty quantification*. Department of Mathematics, Dartmouth College, Hanover, NH, February 3, 2018.
10. *Model reduction for uncertainty quantification of high-dimensional systems*. Department of Mathematics, Johannes Gutenberg Universität Mainz, Germany, November 21, 2017.

9. *Data-driven reduced-order modeling for identification and control of large-scale systems*. Aerospace Computational Design Labs seminar, Department of Aeronautics and Astronautics, MIT, Cambridge, Friday, May 12, 2017.
8. *Exploiting low-dimensional structures for sensing and control of fluids via data-driven reduced-order modeling*. Sibley School of Mechanical and Aerospace Engineering, Cornell University, April 18, 2017.
7. *Multifidelity computation of failure probabilities*. Department of Mathematics Colloquium, Blacksburg, VA, March 17, 2017.
6. *Data-driven low-dimensional modeling for analysis and decision-making*. Sandia National Laboratories, Livermore, CA, March 15, 2017.
5. *Exploiting low-dimensional structures for sensing and control of fluids via data-driven reduced-order modeling*. Computational Science Seminar, Department of Mathematics, University of Massachusetts Dartmouth, February 15, 2017.
4. *Exploiting low dimensional structures for control, design, and optimization*. Aerospace Computational Design Labs seminar, Department of Aeronautics and Astronautics, MIT, Cambridge, February 19, 2016.
3. *Tangential interpolation for data-driven model reduction by the Eigensystem Realization Algorithm*. SIAM student seminar, Department of Computational and Applied Mathematics, Rice University, Houston, March 12, 2014
2. *Solving algebraic Riccati equations via projection methods*. Department of Mathematics seminar, University of Missouri Science and Technology, Rolla, January 15, 2014.
1. *Model reduction of the coupled Burgers' equation in conservation form*. Fraunhofer ITWM, Kaiserslautern, Germany, October 24, 2011.

PRESENTATIONS (CONFERENCES)

35. *Reduced-order models for risk measure estimation in robust design*. ENUMATH 2019, Egmond aan Zee, Netherlands, October 3, 2019.
34. *Lifting transformations and model reduction*. ENUMATH 2019, Egmond aan Zee, Netherlands, September 30, 2019.
33. *Multifidelity estimation of risk measures in robust design*. 15th U.S. National Congress on Computational Mechanics, Austin, TX, July 30, 2019.
32. *Conditional-Value-at-Risk estimation via reduced-order models*. East Coast Optimization Meeting (ECOM) 2019; George Mason University, April 4, 2019.
31. *Lifting nonlinear systems: More structure, more opportunities for ROM?* SIAM conference on Computational Science and Engineering; Spokane, February 26, 2019.
30. *Stabilization of reduced-order flow models through learning-based closure modeling*. World Congress of Computational Mechanics (WCCM), New York City, July 27, 2018.
29. *Lifting nonlinear systems: More structure, more opportunities for ROM?* Data to Decisions: Computational Methods for Design of Next-Generation Engineered Systems Workshop, Singapore, May 31, 2018.
28. *Conditional-value-at-risk estimation with reduced-order models*. MoRePaS IV conference (Model Reduction of Paramatrized Systems); Nantes, France, April 10, 2018.
27. *Conditional-value-at-risk estimation with reduced-order models*. Isaac Newton Workshop on Reducing Dimensions and Cost for UQ in Complex Systems; Cambridge, UK, March 7, 2018.
26. *Data-driven reduced-order models for control of PDEs with uncertain parameters*. SIAM conference on Control and Its Applications; Pittsburgh, July 10, 2017.
25. *Stabilization of reduced-order flow models through learning-based closure modeling*. Conference on Classical and Geophysical Fluid Dynamics: Modeling, Reduction and Simulation; Virginia Tech, Blacksburg, June 25, 2017.
24. *Data-driven model reduction via CUR-factored Hankel approximation*. SIAM conference on Optimization; Vancouver, Canada, May 23, 2017.
23. *Multifidelity failure probability estimation in combustion modeling*. 16th International Conference on Numerical Combustion; Orlando, April 3, 2017.
22. *Multifidelity computation of failure probabilities for systems with uncertain parameters*. SIAM conference on Computational Science and Engineering; Atlanta, March 2, 2017.

21. *Data-driven modeling for control of systems with time-varying and uncertain parameters*. Workshop on Data-Driven Methods for Reduced-Order Modeling and Stochastic Partial Differential Equations; Banff International Research Station, Canada, January 29–February 3, 2017.
20. *Reduced-order models from data: Eigensystem realization algorithm and CUR-factorization*. Conference on Recent Developments in Numerical Methods for Model Reduction; Paris, France, November 9, 2016.
19. *Control for systems with uncertain parameters through reduced-order models*. SIAM Annual Meeting; Boston, July 15, 2016.
18. *Model reduction for control of a multiphysics system: coupled Burgers' equation*. American Control Conference; Boston, July 8, 2016.
17. *Control for systems with uncertain parameters through data-driven models*. Workshop on Data to Decisions in Aerospace Engineering; University of Auckland, New Zealand, April 19, 2016.
16. *System identification and model reduction for MIMO systems via the Eigensystem Realization Algorithm*. Data-driven model order reduction and machine learning conference, Stuttgart, Germany, March 31, 2016.
15. *Detection of parameter-dependent regimes in complex flows via compressed sensing and dynamic mode decomposition*. Model Reduction of Parametrized Systems (MoRePaS); Trieste, Italy, Oct. 13–16, 2015.
14. *On POD and Krylov methods for solution of algebraic Riccati equations*. SIAM Control and its Applications; Paris, July 8–10, 2015.
13. *Full flux models for optimization and control of heat exchangers*. American Control Conference; Chicago, July 1–3, 2015.
12. *Tangential interpolation framework for MIMO eigensystem realization* (Poster). SIAM Computational Science and Engineering; Salt Lake City, March 14–18, 2015.
11. *Solving algebraic Riccati equations via proper orthogonal decomposition*. IFAC World Congress; Cape Town, August 24–29, 2014.
10. *A Proper orthogonal decomposition based method for solving algebraic Riccati equations*. SIAM Annual Meeting; Chicago, July 7–11, 2014.
9. *Tangential interpolation for data-driven model reduction by the eigensystem realization algorithm*. VT SIAM Student Conference; Virginia Tech, March 8, 2014.
8. *Convergence of low-order Riccati solutions*. 3rd International Summer School on Numerical Linear Algebra; Shanghai, August 2, 2013.
7. *Parameter sensitivity of POD-based reduced-order controllers*. SIAM Southeastern Atlantic Section Meeting; University of Tennessee, March 23–24, 2013.
6. *LQR optimal control for a thermal-fluid dynamics* (Poster). SIAM Computational Science and Engineering; Boston, February 25–March 1, 2013.
5. *Optimal and suboptimal LQR control for a coupled Burgers' equation*. Southeastern Atlantic Regional Conference on Differential Equations; Wake Forest University, October 19–20, 2012.
4. *Control of a coupled Burgers' equation using POD* (Poster). Workshop on Adaptivity and Model Order Reduction in PDE Constrained Optimization; Hamburg, July 23–27, 2012.
3. *POD study for a coupled Burgers' equation* (Poster). SIAM Annual Meeting; Minneapolis, July 9–13, 2012.
2. *A POD manual for a coupled Burgers' equation*. SIAM Student Conference (Johnfest); Virginia Tech, March 3, 2012.
1. *POD-based model reduction*. SIAM Student Chapter at Virginia Tech; February 14, 2012.

WORKSHOPS & VISITS

15. Oden Institute for Computational Engineering and Sciences, University of Texas at Austin, Prof. Karen Willcox, July 25–August 1, 2019.
14. Oden Institute for Computational Engineering and Sciences, University of Texas at Austin, Prof. Karen Willcox, March 4–8, 2019.
13. Department of Computational and Applied Mathematics (CAAM), Rice University, Houston, Prof. Matthias Heinkenschloss, October 9–13, 2017.
12. Department of Aerospace Engineering at the University of Michigan, Prof. Karthik Duraisamy, March 30–31, 2017.

11. Department of Computational and Applied Mathematics (CAAM), Rice University, Houston, Prof. Matthias Heinkenschloss, January 16–20, 2017.
10. Institute for Computational Engineering and Sciences, University of Texas at Austin, Prof. Karen Willcox August 2–5, 2016.
9. Rocky Mountain Summer Workshop on Uncertainty Quantification, CU Denver, July 15–17, 2015.
8. Department of Mathematics, University of Konstanz, Germany, Prof. Stefan Volkwein, July 13, 2015.
7. IMA Special Workshop: Careers and Opportunities in Industry for Mathematical Scientists, Minneapolis, April 7–9, 2014.
6. Department of Computational and Applied Mathematics (CAAM) at Rice University, Houston, March 10–12, 2014.
5. University of Missouri Science & Technology, Prof. John Singler, January 9–16, 2014.
4. Science in Finance Workshop, D-fine GmbH, Kronberg, Germany, November 13–15, 2013.
3. SIAM Gene Golub Summer School on Matrix Functions and Matrix Equations, Shanghai, July 22–August 9, 2013.
2. Workshop on Adaptivity and Model Order Reduction in PDE Constrained Optimization, Hamburg, July 23–27, 2012.
1. Workshop on Future Directions in Applied Mathematics, Raleigh, March 10–11, 2011.

PROFESSIONAL SOCIETIES

- Society for Industrial and Applied Mathematics (SIAM)
- American Institute of Aeronautics and Astronautics (AIAA)
- German Academic International Network (GAIN)

SERVICE

Associate Editor

- American Control Conference, SIAM Section, invited by Professor Belinda Batten, 2016, 2017

Journal Paper Referee

- AIAA Journal
- Automatica
- Advances in Computational Mathematics (ACOM)
- Computer Methods in Applied Mechanics and Engineering (CMAME)
- Fluids
- International Journal for Numerical Methods in Engineering (IJNME)
- International Journal of Computer Mathematics
- IEEE Transactions of Automatic Control (TAC)
- IEEE Control Systems Letters
- Mathematical Methods in the Applied Sciences
- Mathematics
- Mathematics of Control, Signals, and Systems (MCSS)
- Numerical Mathematics Theory, Methods and Applications
- Physica D: Nonlinear Phenomena
- Proceedings of the Royal Society A
- SIAM Journal on Matrix Analysis and Applications (SIMAX)
- SIAM Journal on Numerical Analysis (SINUM)
- SIAM Journal on Scientific Computing (SISC)
- SIAM Journal on Uncertainty Quantification (JUQ)
- Structural and Multidisciplinary Optimization (SMO)
- Systems & Control Letters (SCL)
- The Aeronautical Journal

Conference Paper Referee

- American Control Conference (ACC): 2015, 2016, 2017, 2018
- Conference on Decision and Control (CDC): 2016, 2017, 2018
- European Control Conference (ECC): 2016

Conference and Minisymposia Organization

- IACM Conference on *Mechanistic Machine Learning and Digital Twins for Computational Science, Engineering, & Technology* [link], September 26–29, 2021, San Diego, CA. Local organizing committee.
- SIAM Conference on Computational Science and Engineering (CSE21), Forth Worth, TX. *Structure-preserving model order reduction for large-scale systems*. Co-organized with Prof. Volker Mehrmann (TU Berlin).
- SIAM Conference on Computational Science and Engineering (CSE19), Spokane, WA. *Data-augmented reduced-order modeling: operator learning and closure/error modeling*. Co-organized with Dr. Kevin Carlberg (Sandia National Labs).
- 16th International Conference on Numerical Combustion, Orlando, FL. *Uncertainty quantification and model inadequacy in combustion simulations*. Co-organized with Dr. Todd Oliver (ICES, UT Austin).
- SIAM Conference on Computational Science and Engineering (CSE17), Atlanta, GA. *Model Order Reduction: Perspectives from Junior Researchers*. Co-organized with Dr. Alessandro Alla (FSU).
- SIAM Annual Meeting (AN16), Boston, MA. *Data-based methods towards optimal control of complex systems*. Co-organized with Dr. Joshua Proctor (Institute for Disease Modeling).

Academic Community for Engineering Success (ACES) Mentor @ UCSD

ACES supports students from economically and educationally underserved backgrounds, and focuses on enhancing student success in their chosen engineering major through admission to the Summer Engineering Institute, faculty mentorship, a collaborative peer support community, and additional academic enrichment.

Mentor-Protégé Program at SIAM CSE 2017 & 2019 Conferences

- Mentored CSE students as part of Broader Engagement Program
- Held one-on-one discussions about career opportunities and graduate school

SIAM Student Chapter at Virginia Tech

President, 2013–2014 and vice president for research, 2012–2013

- Initiated new activities: First poster session and first industrial conference
- Organized biweekly talks with invited faculty and graduate student speakers
- Assisted in planning student conference at VT with 20 speakers and posters

Computational Resources Committee

Graduate Student Representative at Virginia Tech

- Evaluated graduate students' needs for computational resources
- Suggested purchases to committee
- Discussed and approved final budget