Astrid C Layton

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USA and NL Citizen

Education

2009–2014 **Ph.D., Mechanical Engineering**, *Georgia Institute of Technology*, Atlanta, GA
Sustainability, Design, Ecology, Heat Transfer, and Fluid Dynamics.

2004–2009 **B.S., Mechanical Engineering**, *University of Pittsburgh*, Pittsburgh, PA
Minor in Studio Arts.

Experience

Jan 2017–Present **Assistant Professor**, *Texas A&M University*,
J. Mike Walker '66 Dept. of Mechanical Engineering, College Station, TX, USA.

- Texas A&M Energy Institute member
- Texas A&M Engineering Education member
- Head of the Bio-inspired Sustainable Systems Lab (BiSSL)

Courses Taught:

- Undergraduate Fluid Mechanics (MEEN 344)
- Intro to Mech. Eng. Design Studio & Lecture (MEEN 401, 401S)
- Graduate & Undergraduate Bio-Inspired Engineering Design (MEEN 696/440)

Aug 2014–Dec 2016 **Visiting Lecturer**, *Georgia Tech Lorraine - Georgia Institute of Technology*,
Dept. of Mechanical Engineering, Metz, France.

- Seven semesters as Instructor of Record for the 3rd year Mechanical Engineering undergraduate courses - Heat Transfer (ME3345) and Introduction to Fluid Mechanics (ME3340)
- Two semesters as Instructor of Record for the 3rd year Civil Engineering undergraduate course - Fluid Mechanics (CEE3040)

Aug 2009–Dec 2014 **Graduate Research Assistant**, *Georgia Institute of Technology*,
Dept. of Mechanical Engineering, Atlanta, GA, USA.

- Analyzed properties of biological ecosystems and the design of industrial resource networks
- Designed for sustainability, efficiency, cost, stability, reduction of waste and raw materials, and robustness using ecosystem analysis and optimization tools
- Worked at the intersection of Mechanical Engineering and Biology in close collaboration with ecologists and mechanical engineers

Aug 2006–April 2008 **Industry Support Engineering Intern**, *Bayer MaterialScience*,
Pittsburgh, PA, USA.

- Plastic flow analyses and optimizations using Moldflow. Stress and structural property simulations and analysis using ANSYS.
- Complex 3D model generation using SolidWorks
- Independently designed a machine for a patented material manufacturing process which enabled small manufacturers to tap into previously unavailable markets
- Collaborations with mechanics and designers to ensure streamlined processes

Refereed Journal Publications

** denotes Dr. Layton's students*

under review *Chatterjee, A., R. Malak, and A. Layton. "Bio-Inspired System of Systems Resilience Exploration." *Systems Engineering*.

under review *Warrington, S. and A. Layton. "Ecosystem-Inspired Guidance for the Incorporation of Renewable Utilities in a Multi-Use Campus Network." *PLOS ONE*.

under review *Ezemba, J. and A. Layton. "Bio-Inspired Avenues for Advancing Brain Injury Prevention." *Bioinspiration & Biomimetics*.

under review He, W., T. Creasy, A. Layton, A. Borges, and *J. Williams. "Resistance to Opportunities of Plastic Recycling." *Architectural Research Centers Consortium* – Special Issue: Architecture, Waste, and the Circular Economy.

under review Huang, H., Z. Mao, *V. Panyam, A. Layton, and K. Davis. "An Ecological Robustness-Oriented Approach for Power System Network Expansion." *Applied Energy*.

1. Ali, A., A. Layton, P. Kio, and *J. Williams. (2021) "Matrix Trays: From Waste to Opportunities." *Journal of Cleaner Production* 300: 126813. DOI: 10.1016/j.jclepro.2021.126813
2. *Chatterjee, A., R. Malak, and A. Layton. (2021) "Exploring System of Systems Resilience Versus Affordability Trade-Space Using a Bio-Inspired Metric." *Journal of Computing and Information Science in Engineering*. 21(5): 1-13. DOI: 10.1115/1.4050288
3. *Chatterjee, A., *C. Brehm, and A. Layton. (2021) "Evaluating Benefits of Ecologically-inspired Nested Architectures for Industrial Symbiosis." *Resources, Conservation & Recycling* 167. DOI: 10.1016/j.resconrec.2021.105423
4. Bhasin, D., D. McAdams, and A. Layton. (2021) "A Product Architecture-Based Tool For Bioinspired Function-Sharing." *Journal of Mechanical Design*. 143: 081401-1–10. DOI: 10.1115/1.4049151
5. *Brehm, C. and A. Layton. (2021) "Nestedness in eco-industrial parks: exploring linkage distribution to promote sustainable industrial growth." *Journal of Industrial Ecology* 25: 205-218. DOI: 10.1111/jiec.13057
6. *Chatterjee, A. and A. Layton. (2020) "Mimicking Nature for Resilient Resource and Infrastructure Network Design." *Reliability Engineering & System Safety* 204: 107142. DOI: 10.1016/j.ress.2020.107142
7. *Dave, T. and A. Layton. (2020) "Designing Ecologically-Inspired Robustness into a Water Distribution Network," *Journal of Cleaner Production* 254(1): 120057. DOI: 10.1016/j.jclepro.2020.120057
8. *Panyam, V. and A. Layton. (2019) "Understanding ecological pathway efficiency and robustness for human network design using thermodynamic power cycles." *PLOS ONE* 14(12): e0226993. DOI: 10.1371/journal.pone.0226993
9. *Panyam, V., H. Huang, K. Davis, and A. Layton. (2019) "Bio-Inspired Design for Resilient Power Networks." *Applied Energy* 251. DOI: 10.1016/j.apenergy.2019.113349
10. Reap, J. and A. Layton. (2017) "Lessons from Living Systems for the Development of Sustainable Industrial Resources Networks." *Journal of Energy Challenges and Mechanics* 4(1): 1-10. ISSN: 2056-9386
11. Layton, A., B. Bras and M. Weissburg. (2017) "Improving Performance of Eco-Industrial Parks." *International Journal of Sustainable Engineering* 10(4-5): 250-259. DOI: 10.1080/19397038.2017.1317874
12. Layton, A., B. Bras and M. Weissburg. (2016) "Designing Industrial Networks using Ecological Food Web Metrics." *Journal of Environmental Science & Technology* 50(20): 11243-11252. DOI: 10.1021/acs.est.6b03066
13. Layton, A., B. Bras and M. Weissburg. (2016) "Ecological Principles and Metrics for Improving Material Cycling Structures in Manufacturing Networks." *ASME Journal of Manufacturing Science and Engineering* 138(10): 101002-101002-12. DOI: 10.1115/1.4033689

14. Layton, A., B. Bras and M. Weissburg. (2016) "Industrial Ecosystems and Food Webs: An expansion and update of existing data for eco-industrial parks and understanding the ecological food webs they wish to mimic." *Journal of Industrial Ecology* 20(1): 85-98. DOI: 10.1111/jiec.12283
15. Layton, A., J. J. Reap, B. Bras and M. Weissburg. (2012) "Correlation between Thermodynamic Efficiency and Ecological Cyclicity for Thermodynamic Power Cycles." *PLOS ONE* 7(12): 1-7. DOI: 10.1371/journal.pone.0051841

Other Publications

1. *Chatterjee, A., A. Layton and R. Malak. (2019) "Ecology-Inspired Technique for Resilient Engineered System of Systems Design." Final Report for DoD System Engineering Research Center (SERC).
2. Bras, B., A. Layton and M. Weissburg. (2016) "Improving Performance of Eco-Industrial Parks." *Sustainable Design and Manufacturing 2016.* Eds. R. Setchi, J. R. Howlett, Y. Liu and P. Theobald. Cham, Springer International Publishing: 227-240.
3. Layton, A. (2014) "Food Webs: Realizing Biological Inspiration for Sustainable Industrial Resource Networks." Ph.D. Mechanical Engineering, Georgia Institute of Technology.

Refereed Conference Publications

** denotes Dr. Layton's students*

under review *Chatterjee, A., H. Huang, R. Malak, K. Davis, and A. Layton. Extending the Ecological Network Analysis Framework to Cyber-Physical Power Networks. *IEEE 2021 International Conference on Communications, Control, and Computing Technologies for Smart Grids*. Aachen, Germany.

under review Huang, H., *A. Chatterjee, A. Layton, and K. Davis. A Preliminary Investigation into Ecological Network Analysis for Cyber-Physical Power Systems. *IEEE 2021 International Conference on Communications, Control, and Computing Technologies for Smart Grids*. Aachen, Germany.

1. *Hairston, G. and A. Layton. An Eco-Industrial Park-Based Method for Net Zero Community Creation. *ASME 2021 International Design Engineering Technical Conferences and Computers & Information in Engineering Conference* (virtual due to COVID-19).
2. *Wilson, T., *A. Chatterjee, and A. Layton. (2021) Developing a Supply Chain Modeling Approach to Facilitate Ecology-Inspired Design for Sustainability and Resilience. *ASME 2021 International Design Engineering Technical Conferences and Computers & Information in Engineering Conference* (virtual due to COVID-19).
3. *Blair, S., H. Banks, J. Linsey, and A. Layton. (2021) Ecosystem Modularity as a Guide for Makerspaces Evaluations. *ASEE 2021 Conference & Exposition*. Long Beach, CA, USA.
4. *Foster, A., H. Huang, M. Narimani, *L. Homiller, K. Davis, and A. Layton. (2021) . *2021 IEEE Texas Power and Energy Conference*. College Station, TX, USA. (virtual due to COVID-19)
5. Huang, H., *V. Panyam, M. Narimani, A. Layton, and K. Davis. (2021) Mixed-Integer Optimization for Bio-Inspired Robust Power Network Design. The 52nd North American Power Symposium (NAPS). Tempe, AZ, USA. (virtual due to COVID-19)
6. *Chatterjee, A., R. Malak, and A. Layton. (2020) Bio-inspired Design: Quantifying System of Systems Fitness. *18th Annual Conference on Systems Engineering Research (CSER)*. Redondo Beach, CA, USA. (virtual due to COVID-19)

7. *Dave, T. and A. Layton. Extending the use of Bio-Inspiration for Water Distribution Networks to Urban Settings. *ASME 2020 International Design Engineering Technical Conferences and Computers & Information in Engineering Conference*. St. Louis, MI, USA. (virtual due to COVID-19) DOI: 10.1115/DETC2020-22374
8. *Chatterjee, A., R. Malak, and A. Layton. (2020) Exploring a Bio-Inspired System of Systems Resilience vs. Affordability Tradespace. *ASME 2020 International Design Engineering Technical Conferences and Computers & Information in Engineering Conference*. St. Louis, MI, USA. (virtual due to COVID-19) DOI: 10.1115/DETC2020-22396
9. *Brehm, C., J. Linsey, and A. Layton. (2020) Using A Modularity Analysis to Determine Tool and Student Roles within Makerspaces. *2020 ASEE Virtual Annual Conference*. Montreal, Canada. (virtual due to COVID-19) DOI: 10.18260/1-2–35445
10. *Chatterjee, A. and A. Layton. (2020) Bio-inspired Design for Sustainable and Resilient Supply Chains. *27th CIRP Life Cycle Engineering (LCE) Conference*. Grenoble, France. (virtual due to COVID-19) DOI: 10.1016/j.procir.2020.01.127
11. *Brehm, C., *A. Chatterjee, and A. Layton. (2020) Mimicking the nested structures of ecosystems in the design of industrial water networks. *27th CIRP Life Cycle Engineering (LCE) Conference*. Grenoble, France. (virtual due to COVID-19) DOI: 10.1016/j.procir.2020.01.104
12. *Panyam, V. and A. Layton. (2019) Bio-inspired modeling approaches for human networks with link dissipation. *ASME 2019 International Design Engineering Technical Conferences and Computers & Information in Engineering Conference*. Anaheim, CA, USA. DOI: 10.1115/DETC2019-98171
13. *Chatterjee, A. and A. Layton. (2019) Bio-Inspired human network design: multi-currency robustness metric formulation inspired by ecological network analysis. *ASME 2019 International Design Engineering Technical Conferences and Computers & Information in Engineering Conference*. Anaheim, CA, USA, ASME. DOI: 10.1115/detc2019-98235
14. *Williams, J., *S. Warrington, and A. Layton. (2019) Waste Reduction: A review of common options and alternatives. *ASME 2019 14th International Manufacturing Science and Engineering Conference*. Erie, PA, USA. DOI: 10.1115/MSEC2019-2903
15. Tsenn, J. H. Lewis, and A. Layton. (2019) An Analysis of Factors Impacting Design Self-Efficacy of Senior Design Students. *ASEE 2019 Annual Conference & Exposition*. Tampa, FL, USA. DOI: 10.18260/1-2–32055
16. *Panyam, V., H. Huang, K. Davis, and A. Layton. (2019) An ecosystem perspective for the design of sustainable power systems. *26th CIRP Conference on Life Cycle Engineering*. West Lafayette, IN. DOI: 10.1016/j.procir.2018.12.005
17. *Brehm, C. and A. Layton. (2019) Designing eco-industrial parks in a nested structure to mimic mutualistic ecological networks. *26th CIRP Conference on Life Cycle Engineering*. West Lafayette, IN. DOI: 10.1016/j.procir.2018.12.011
18. *Dave, T. and A. Layton. (2019) Bio-inspired design for resilient water distribution networks. *The 26th CIRP Conference on Life Cycle Engineering*. West Lafayette, IN, USA. DOI: 10.1016/j.procir.2019.01.020
19. *Panyam, V., H. Huang, B. Pinte, K. Davis, and A. Layton. (2019) Bio-inspired design for robust power networks. *2019 IEEE Texas Power and Energy Conference (TPEC)*. College Station, TX. DOI: 10.1109/TPEC.2019.8662130
20. *Panyam, V., *T. Dave, and A. Layton. (2018) Understanding Ecological Efficiency and Robustness for Network Design Using Thermodynamic Power Cycles. *ASME 2018 International Design Engineering Technical Conferences and Computers & Information in Engineering Conference*. Quebec City, Canada. DOI: 10.1115/DETC2018-85404

21. Layton, A., B. Bras and M. Weissburg. (2017) Designing Sustainable Manufacturing Networks: The role of exclusive species in achieving ecosystem-type performance. *ASME 2017 International Design Engineering Technical Conferences and Computers & Information in Engineering Conference*. Cleveland, OH, USA. DOI: 10.1115/DETC2017-68334
22. Bras, B., A. Layton and M. Weissburg. (2016) Improving Performance of Eco-Industrial Parks. *SDM 3rd International Conference on Sustainable Design and Manufacturing*. Crete, Greece. DOI: 10.1007/978-3-319-32098-4_20
23. Layton, A., B. Bras and M. Weissburg. (2015) Ecological Robustness as a Design Principle for Sustainable Industrial Systems. *ASME 2015 International Design Engineering Technical Conferences and Computers & Information in Engineering Conference*. Boston, MA, USA. DOI: 10.1115/DETC2015-47560
24. Layton, A., J. Reap, B. Bras and M. Weissburg. (2013) Biologically inspired design of closed loop manufacturing networks. *ASME 2013 International Mechanical Engineering Congress and Exposition*. San Diego, CA, USA. DOI: 10.1115/IMECE2013-63958
25. Layton, A., J. J. Reap and B. Bras. (2011) A Correlation between Thermal Efficiency and Biological Network Cyclicity. *ASME 2011 5th International Conference on Energy Sustainability*. Washington D.C., USA. DOI: 10.1115/ES2011-54787

Poster Only Presentations

2019 SERC Sponsored Research Review. "Ecology-Inspired Technique for Resilient Engineered System of Systems Design." DoD System Engineering Research Center (SERC). Washington D.C., USA.

2019 Texas A&M President's Excellence Symposium. "Matrix Trays: From Waste to Opportunity." College Station, TX, USA.

2019 Texas A&M Student Research Week. "Analysis of Varying Human Systems Through Use of Ecological Metrics." College Station, TX, USA.

2018 Texas A&M Conference on Energy. "Bio-Inspired Power Grid Design and Optimization." College Station, TX, USA.

Conference Presentations without Publications

2021 Texas A&M Student Research Week. "Methods for Understanding Ecosystem Extinctions as Inspiration for Determining Critical Components in Power Grids." College Station, TX. (virtual due to COVID19)

2019 Texas A&M College of Architecture's Resilience Rising: Research and Practice on Hurricane Harvey and Hazards of the Future Symposium. "Investigating Ecosystems' Mimicry towards Design of Resilient Resource and Infrastructure Networks." College Station, TX.

2019 Texas A&M College of Architecture's 21st Annual Research Symposium: Natural Built, Virtual. "Matrix Trays: From Waste to Opportunities." College Station, TX.

2019 Texas A&M Student Research Week. "Strategic Distribution Capital to Promote Sustainability of Industrial Networks." College Station, TX.

2019 Texas A&M Student Research Week. "Bio-inspired Modeling Approaches for Human Networks with Link Dissipation." College Station, TX.

2019 Texas A&M Student Research Week. "Sustainable Water Networks Design: A Bio-inspired approach." College Station, TX.

2019 Texas A&M Student Research Week. "Bio-inspired system design: modifying ecological robustness for multi-currency human networks." College Station, TX.

2019 Texas A&M Ecological Integration Symposium. "Designing Power Grids to Mimic Food Webs." College Station, TX.

2015 ISBE Biomimetics Workshop 2015 - Optimization and trade-off in Biomimetics, "The Ecology of Human Infrastructure." Changchun, China.

2013 Georgia Tech Research and Innovation Conference, "Bio-Inspired Design of Thermal Networks." Atlanta, GA.

2011 6th ASME Energy Sustainability Conference, "A Correlation between Thermal Efficiency and Biological Network Cyclicity." Washington D.C.

2011 Institute for Biological Engineering Conference, "Environmental to Industrial Ecology: Analogies." Atlanta, GA.

2011 Institute for Biological Engineering Conference, "Understanding Biological Metabolic Rate Limits for use in Engineering." Atlanta, GA.

Invited Research Seminars & Panels

2021 *The Learning Factory Global BUILD Workshop Seminar* in the College of Engineering, Penn State University. "Drawing from Nature." Virtual. (26-April)

2020 *Graduate Research Seminar* in the Environmental and Ecological Engineering Department, Purdue University. "Ecosystems as design inspiration for resilient and sustainable human-engineered networks." Virtual. (29-Sept.)

2020 *Graduate Research Seminar* in the Civil Engineering Department, Texas A&M University. "Bio-Inspired System Design: Using Nature to Improve the Resilience and Sustainability of Our Water Networks." Virtual. (7-Sept.)

2020 *System Engineering (SE) Forum Webinar* for the Federal Aviation Administration (FAA). "Ecology-Inspired Techniques for Resilience Evaluation of Engineering System of Systems." Virtual. (11-Feb.)

2020 *TREC2020 Keynote Talk* for the Student Engineering Council's annual Texas Regional Engineering Conference design competition "Bio-Inspired Engineering for a Sustainable Future." College Station, TX. (1-Feb.)

2019 *Graduate Research Seminar* in the J. Mike Walker '66 Department of Engineering, Texas A&M University. "Using biological inspiration to improve the design of complex human-engineered networks." College Station, TX. (13-Nov.)

2018 *Energy and Power Group Research Seminar* in the Department of Electrical & Computer Engineering, Texas A&M University. "Bio-Inspired Design for Robust Power Systems." College Station, TX. (26-Nov.)

2018 Panelist, ASME 2018 International Design Engineering Technical Conference. ASME CIE Systems Engineering and Information Knowledge Management (SEIKM) Panel on "Network Science Approaches for Systems Engineering Design." Quebec City, Canada. (28-Aug.)

Popular Press

2021 Texas A&M Press, Vandana Suresh *"Following nature's cue, researchers build successful, sustainable industrial networks."* https://engineering.tamu.edu/news/2021/04/MEEN-following-natures-cue-researchers-build-successful-sustainable-industrial-networks.html

2020 ASME Mechanical Engineering Magazine, Jean Thilmany *"How the Food Web Can Keep the Electricity Flowing."* www.asme.org/topics-resources/content/how-the-food-web-can-keep-the-electricity-flowing

2020 Texas A&M Engineering: SoundBytes, Season 1: Episode 29, *"Engineer This!: Taking inspiration from food webs to power grids (Featuring Dr. Astrid Layton)."* www.buzzsprout.com/497908/2937427-engineer-this-taking-inspiration-from-food-webs-to-power-grids-featuring-dr-astrid-layton

2020 Texas A&M Engineering: SoundBytes, Season 1: Episode 28, *"Engineer This!: What's wrong with recycling? (Featuring Dr. Astrid Layton)."* www.buzzsprout.com/497908/2903104-ask-an-engineer-what-s-wrong-with-recycling-featuring-dr-astrid-layton

Invited Workshop Participant

2019 DoE ARPA-E Bio-Inspired Design Working Group. San Francisco, CA.

2018 US Business Council for Sustainable Development (BCSD) South Central Regional Meeting. Austin, TX.

Grants

External 2020 – 2023 *NSF*. "Quantitative Network Analysis for Benchmarking and Improving Makerspaces." NSF Improving Undergraduate STEM Education (IUSE). PI: Astrid Layton.

2020 – 2021 *DoD*. WRT-1027 "Ecology-Inspired Techniques for Resilient Design of System of Systems." DoD Systems Engineering Research Center (SERC). PI: Richard Malak, CoPI: Astrid Layton.

2019 *DoD*. WRT-1011 "Incubator: Ecology-Inspired Technique for Resilience Evaluation of Engineered Systems of Systems." DoD Systems Engineering Research Center (SERC). PI: Richard Malak, CoPI: Astrid Layton.

Internal 2021 – 2023. "Artificial Intelligence Assisted Bio-Inspired Engineering Design." President's Excellence Fund: Texas A&M Triads for Transformation. PI: Daniel McAdams, CoPI: Astrid Layton, Adam Rosenthal.

2019 – 2020. "Enhancing the Impact, Occurrence, and Frequency of Innovation via Network Modeling and Analysis." Texas A&M University MEEN Seed Grant. PI: Astrid Layton, CoPI: Cynthia Hipwell.

2018 – 2019. "Bio-Inspired Design of Complex Energy Systems to Achieve Robust, Efficient, and Sustainable Networks." Texas A&M University Energy Institute Seed Grant. PI: Astrid Layton, CoPI: Katherine Davis.

2018 – 2019. "Matrix Trays: From Waste to Opportunities." President's Excellence Fund: Texas A&M Triads for Transformation. PI: Ahmed Ali, CoPI: Astrid Layton, Ankit Srivastava.

Fellowships and Awards

2021. The Peggy L. and Charles Brittan '65 Outstanding Undergraduate Teaching Award, J. Mike Walker '66 Department of Mechanical Engineering, Texas A&M University.

2020. Best Paper Award CIE-SEIKM at the ASME 2020 International Design Engineering Technical Conference: **Chatterjee, A., R. Malak, and A. Layton. "Exploring a Bio-Inspired System of Systems Resilience vs. Affordability Tradespace."*

2019. Finalist (top 8) for the Leo Best Paper Award at the 2019 CIRP Life Cycle Engineering Conference: **Brehm, C. and A. Layton. "Designing eco-industrial parks in a nested structure to mimic mutualistic ecological networks."*

2017. 2nd place, 2016 Graedel Best Paper by a junior author, Journal of Industrial Ecology: *Layton, A., B. Bras and M. Weissburg. "Industrial Ecosystems and Food Webs: An expansion and update of existing data for eco-industrial parks and understanding the ecological food webs they wish to mimic."*

2011. Honorable Mention, National Science Foundation Graduate Research Fellowship

2009. Magna Cum Laude, University of Pittsburgh

Students

2021. TAMU MEEN Graduate Excellence Fellowship. PhD student Samuel Blair.

2021. TAMU MEEN Graduate Summer Research Fellowship, *"Ecological-modularity as inspiration for community-scale net zero achievement."* MS student Garrett Hairston.

2021. TAMU MEEN Graduate Summer Research Fellowship, *"Ecological Systems Approach to Understanding Makerspace Networks."* PhD student Samuel Blair.

2020. TAMU MEEN Charles Crawford Fellowship for Graduate Excellence. PhD student Abheek Chatterjee.

2020. TAMU MEEN Graduate Summer Research Fellowship, *"Ecology-Inspired Design of Resilient and Affordable System of Systems."* PhD student Abheek Chatterjee.

2017-2020. Clare Boothe Luce Scholar Award. Undergraduate student Shelby Warrington.

2019. Best Graduate Engineering Research Presentation, Texas A&M Student Research Week. **Dave, T. and A. Layton. "Sustainable Water Network Design: A Bio-inspired Approach."*

2019. James J. Cain '51 Award. Undergraduate student Shelby Warrington.

2019. J. Mike Walker '66 Impact Award. Undergraduate student Kristina Viro.

2019. TAMU MEEN Emil Buehler Aerodynamic Analog Fellowship. PhD student Abheek Chatterjee.

2019. TAMU MEEN Graduate Excellence Fellowship. MS student Colton Brehm.

2019. TAMU MEEN Graduate Excellence Fellowship. MS student Varuneswara Panyam.

2019. TAMU MEEN Graduate Student Fellowship. MS student Tirth Dave.

Advised Research Students

*denotes current students

PhD *Abheek Chatterjee (Fall 2018 – *Summer 2022*)
PhD Title: Ecosystem Inspiration for the Design and Analysis of Resilient SoS
Investigating the utility of Ecological Network Analysis metrics for engineering resilient, affordable, and sustainable System of Systems (missions engineering, critical infrastructure, and industrial networks). J. Mike Walker 66' Department of Mechanical Engineering Graduate Fellowship (Fall 2019 & 2020) and Graduate Summer Research Fellow (2020). Best Paper Award for his IDETC-CIE conference paper in 2020. Associate Fellow in the Center for the Integration of Research, Teaching, and Learning (CIRTL) Academy for Future Faculty (AFF), Spring 2020.

*Michael Adams (Summer 2020 – *Spring 2024*)
PhD Title: Bio-inspired Design for Power System Resilience
Working on bio-inspiration for the design and analysis of electric power grids.

*Samuel Blair (Fall 2020 – *Spring 2025*)
PhD Title: Bio-Inspiration to Improve the Design of Engineering Makerspaces
Working with Dr. Julie Linsey (Georgia Institute of Technology) and I on engineering makerspace network modeling and bio-inspired design. J. Mike Walker 66' Department of Mechanical Engineering Graduate Summer Research Fellow (2021) and Graduate Fellowship (Fall 2021).

MS *Tyler Wilson (Fall 2020 – *Spring 2022*)
MS Title: Improving the Resilience of Supply Chains Using Ecosystem-Inspired Designs
Mechanical engineering MS student with interests in bio-inspired design and sustainability.

*Luis Rodriguez (Fall 2020 – *Summer 2022*)
MS Title: Ecosystem Decentralization as a Design Guidelines for Resilient Water Networks
Mechanical engineering MS student with interests in bio-inspired design and sustainability.

*Garrett Hairston (Summer 2020 – *Spring 2022*)
MS Title: Bio-Inspired Multi-flow Network Design for Resilient Net Zero Communities
Mechanical engineering MS student with interests in "net-zero" complex systems and the general advancement of renewable energy implementation. J. Mike Walker 66' Department of Mechanical Engineering Graduate Summer Research Fellow 2021.

*Tejas Adsul (Spring 2020 – *Summer 2021*)
MS Title: Ant Inspired Innovation Research Strategies
Working with undergraduate students Kristina Viro/Yanneliz Nava and Dr. Cynthia Hipwell on the design and modeling of innovation networks.

*Andrew Foster (Summer 2020 – *Summer 2021*)
MS Title: Ecological Uniqueness for Understanding Component Important in Power Grids
A&M Energy Institute MSE student working on bio-inspiration for the design and analysis of electric power grids.

Colton Brehm (Fall 2018 – Spring 2020)
MS Title: Improving the Environmental and Economic Outcomes of Industrial Networks using Nestedness to Design Resource Distribution Infrastructure
Winner of the J. Mike Walker 66' Department of Mechanical Engineering Graduate Fellowship, Spring 2019. Finalist for the Leo Award for best paper at the CIRP LCE conference, Summer 2019.

Tirth Dave (Spring 2018 – Fall 2019)
MS Title: Designing Robust Water Distribution Systems using Ecology as an Inspiration
Winner of the best graduate engineering student presentation at Texas A&M Student Research Week, Spring 2019. Winner of the J. Mike Walker 66' Department of Mechanical Engineering Graduate Fellowship, Fall 2019.

Varuneswara Panyam (Fall 2017 – Fall 2019)
MS Title: Bio-inspired Design for Robust Power Systems
Winner of the J. Mike Walker 66' Department of Mechanical Engineering Graduate Fellowship, Spring 2019. Associate Fellow in the Center for the Integration of Research, Teaching, and Learning (CIRTL) Academy for Future Faculty (AFF), Spring 2019.

Jewel William (Fall 2018 – Summer 2019)
MS Title: Opportunities of Applying System Analysis to the US Waste Management System: Bio-Inspired Solutions for a More Circular Economy
Winner of a graduate travel award for the 2019 ASME Manufacturing Science and Engineering Conference, Penn State Erie.

Undergraduate *Jessica Ezemba (Fall 2020 – Summer 2021) Mechanical engineering undergraduate student working on bio-inspiration for brain injury prevention. MEEN440H honors student for Bio-Inspired Engineering Design course Fall 2020.

*Angel Alex (Spring 2021 – Fall 2021) Mechanical engineering undergraduate student working on sustainable resource networks.

*Christian Mendiondo (Spring 2021 – Fall 2021) Biomechanical engineering undergraduate student working on bio-inspired design of a lightweight robotic wrist prosthetic.

Yanneliz Nava (Summer 2020 – Spring 2021) Mechanical engineering undergraduate student working with Dr. Cynthia Hipwell and I on modeling innovation networks. MEEN491 mechanical engineering undergraduate research student.

Shelby Warrington (Fall 2017 – Summer 2020) Clare Boothe Luce Undergraduate Research Award winner (3 year program supports research for undergraduate women in science, mathematics, and engineering). Spring 2020 MEEN491H student.

Laura Homiller (Spring 2020) MEEN491H mechanical engineering undergraduate research student.

Josh Jaynes (Fall 2019 – Spring 2020) Mechanical engineering undergraduate student with interests in circular economy and waste-reduction.

Kristina Viro (Summer 2019 – Spring 2020) Mechanical engineering undergraduate student working with Dr. Cynthia Hipwell and I on modeling innovation networks.

Garrett Hairston (Fall 2019 – Spring 2020) Mechanical engineering undergraduate student, continued in the lab group with an MS.

Colton Brehm (Spring & Summer 2018) Mechanical engineering undergraduate student, continued in the lab group with an MS.

Thesis/Dissertation Committees

Internal Devesh Bhasin (advisor: D. McAdams)

Rafael Dugarte (advisor: B. Rasmussen)

Sam Nguyen (advisor: M. Pate) 2021

Xin Tang (advisor: D. Staack) 2020

Meet Sanghvi (advisor: D. Allaire) 2019

Brian Burrows (advisor: D. Allaire) 2019

Samuel Friedman (advisor: D. Allaire) 2019

Cory Richard Allen (advisor: D. Allaire) 2018

Kyle Baylis (advisor: D. McAdams) 2017

External Hao Huang, Electrical & Computer Engineering, TAMU (advisor: K. Davis)

Henry Banks, Mechanical Engineering, Georgia Tech (advisor: J. Linsey)

Patritia Kio, Architecture, TAMU (advisor: A. Ali)

Stephen Malone, Mechanical Engineering, Georgia Tech (advisor: B. Bras) 2020

Zack Morris, Mechanical Engineering, Georgia Tech (advisor: B. Bras) 2020

Ziyang Li, Architecture, TAMU (advisor: A. Ali) 2020

Kaushik Raghunath, Electrical & Computer Engineering, TAMU (advisor: K. Davis) 2019

Teaching & Mentoring

mentoring

National Graduate Society of Women Engineers (GradSWE) Mentoring Program - Mentor. 2018-2021

Aggie Women in STEM Conference Keynote Talk, invited for annual conference by the Texas A&M University MEEN Girls. "Overcoming obstacles as a woman in STEM." - Invited Keynote. 2021

TAMU Student Engineering Council's annual Texas Regional Engineering Conference (TREC) design competition - Mentor. 2021

Monthly Faculty Lunch TAMU Mechanical Engineering Female Graduate Students (MEFEGS) "Applying for Your First Faculty Position." - Invited Speaker. 2020

TAMU Women in Engineering (WE) "Academic Careers in Engineering" - Panelist. 2020

TAMU Mechanical Engineering Graduate Student Organization (MEGSO) "Navigating Careers in Academia/Research" - Panelist. 2020

TAMU's Student Engineering Council's annual Texas Regional Engineering Conference (TREC) design competition - Mentor/Judge. 2019-2020

Clare Boothe Luce STEM Scholars, 3-year award supporting undergraduate STEM women in research - Research Advisor. 2017-2020

TAMU College of Engineering Professional Development Seminar (ENGR 681) "Applying for Faculty Positions" - Panelist. 2019

TAMU GradSWE "Professional Development Faculty" - Panelist. 2018

TAMU GradSWE "How to Choose the Right Career Path for Me: Academia or Industry?" - Panelist. 2018

Georgia Tech Women in Engineering Mentoring Program - Member. 2012-2014

teaching

Undergraduate Research Seminar (MEEN 381), J. Mike Walker '66 Department of Engineering "Designing Bio-Inspired Engineering Systems." 2021

Undergraduate Access & Inclusion Research Seminar (CLEN 289), College of Engineering "Opportunities in Mechanical Engineering: Bio-Inspired Engineering Design." 2020

Undergraduate Research Seminar (MEEN 381), J. Mike Walker '66 Department of Engineering "Designing Bio-Inspired Engineering Systems." 2019

Undergraduate Access & Inclusion Research Seminar (CLEN 289), College of Engineering "Opportunities in Mechanical Engineering: Bio-Inspired Engineering Systems." 2019

Undergraduate Women in Engineering Research Seminar (CLEN 289), College of Engineering "Opportunities in Mechanical Engineering: Bio-Inspired Engineering Systems." 2019

Project sponsor and primary faculty advisor for mechanical engineering senior design team on an interdisciplinary project with the architecture department. 2018-2019

Undergraduate Research Seminar (MEEN 381), J. Mike Walker '66 Department of Engineering "Designing Bio-Inspired Engineering Systems." 2018

Faculty instructor for the ENGAGE high school summer camp, an engineering program for 60 top performing high school seniors from underrepresented groups in Texas. 2017

Helped institute the Fayette County High School GHOST science fair program - Worked with underprivileged kids to encourage interest in engineering and science careers. 2010-2011

Service

A&M	Mechanical Engineering Undergraduate Women group (MEEN Girls) - Faculty Advisor. 2017-2022
	Mechanical engineering (MEEN) department women faculty group - Organizer/Founder. 2017-2022
	Aggie ACHIEVE (4-yr comprehensive transition program for young adults with intellectual/developmental disabilities who have exited high school) faculty committee - Member. 2021-2023
	MEEN Departmental Seminar Committee - Member. 2017-2018, 2020-2021
	MEEN Departmental Mentoring Committee - Member. 2018-2020
	MEEN Departmental Underrepresented Minority Students Engagement Committee - Member. 2019
	College of Engineering "New Student Conference" - Panelist. 2019
Professional Society	American Society of Mechanical Engineers (ASME) Design Theory & Methodology (DTM) Technical Committee - Chair. 2022-2023
	ASME DTM Technical Committee - Vice Chair. 2021-2022
	ASME DTM Technical Committee - Secretary. 2020-2021
Conference	IDETC2018/19/20/21 - DFMLC & DTM Session Chair & Review Coordinator. 2018-2021
	ASEE2020 - DEED Session Moderator. 2020
	CIRP Life Cycle Engineering - Session Co-Chair. 2019
Reviewer	IDETC-DTM/DFMLC/SEIKM, ICED, CIRP-LCE, ASEE, DESIGN - Conference Article Reviewer. 2016-2021
	National Science Foundation - Grant Panel Reviewer.
	Journal of Industrial Ecology, Journal of Environmental Science & Technology, ASME Journal of Computing and Information Science in Engineering, Journal of Geoinformatics & Geostatistics, ASME Journal of Manufacturing Science and Engineering, ASME Journal of Mechanical Design, International Journal of Sustainable Engineering, PLOS ONE journal, Journal of Environmental Studies and Sciences, Journal of Environmental Management - Reviewer. 2016-2021

Professional Society Affiliations

American Society of Mechanical Engineers (ASME)

ASME Design Theory and Methodology (DTM) Community

ASME Design for Manufacturing and the Life Cycle (DFMLC) Community

ASME System Engineering Information and Knowledge Management (SEIKM) Community

CIRP Life Cycle Engineering (LCE) Conference Scientific Committee

American Society for Engineering Education (ASEE)

Design Society (DESIGN)

ASEE Design in Engineering Education Division (DEED)

Society of Women Engineers (SWE)

INCOSE Natural Systems Working Group (NSWG)

Languages

Native in English, fluent in Dutch, conversational Spanish and French