

! occurred during the COVID 19 pandemic, ^research leader, *lead author, &personnel supervised

Brian K. Taylor

brian.k.taylor@case.edu
engineeringmusician@gmail.com

Education

Case Western Reserve University
Doctor of Philosophy in Mechanical Engineering
Dissertation: *Tracking Fluid Borne Odors in Diverse and Dynamic Environments Using Multiple Sensory Mechanisms*
Engineering Advisor: Dr. Roger D. Quinn
Biology Co-Advisor: Dr. Mark Willis
Cleveland, Ohio
Graduation: 08/17/2012
4.0 Cumulative GPA

Case Western Reserve University
Master of Science in Mechanical Engineering (Requirements Completed in 7/2008)
Thesis: *Implementation and Benchmarking of a Whegs™ Robot in the USARSim Environment*
Advisor: Dr. Roger D. Quinn
Cleveland, Ohio
Graduation: 01/16/2009
4.0 Cumulative GPA

Case Western Reserve University
Bachelor of Science in Aerospace Engineering – Magna Cum Laude
Minor – Music
Cleveland, Ohio
Graduation: 05/15/2005
3.81 Cumulative GPA

Professional Experience

Assistant Professor of Mechanical and Aerospace Engineering
Case Western Reserve University
01/01/2023 – Present
Cleveland, OH

- Performs research on bio and bioinspired navigation strategies. Particular areas of interest include animal magnetoreception, sensory processing using computational neuroscience, and leveraging biological principles in developing engineered systems.
- Supervises research and development work of undergraduates, graduates, postdoctoral researchers, postbaccalaureate researchers, and research associates
- Courses Taught:
 - Advanced Dynamics I (Graduate Level)
 - Control of Mechanical Systems (Undergraduate)

Assistant Professor of Biology
The University of North Carolina at Chapel Hill
07/01/2018 – 12/31/2022
Chapel Hill, NC

- Performs research on bio and bioinspired navigation strategies. Particular areas of interest include animal magnetoreception, sensory processing using computational neuroscience, and leveraging biological principles in developing engineered systems.
- Supervises research and development work of undergraduates, graduates, postdoctoral researchers, postbaccalaureate researchers, and research associates
- Courses Taught:
 - Mathematical Methods for Quantitative Biology (Undergraduate)
 - Introduction to Computational Neuroscience (developed and deployed by me) (Graduate/Undergraduate)

Research Mechanical Engineer
Air Force Research Laboratory
10/8/2012 – 06/29/2018
Eglin Air Force Base, FL

- Performed in house research on bioinspired navigation, and GPS-degraded/denied navigation. Helped craft research tasks for external agencies such as universities and private sector companies to propose against. Performed program management duties to guide and monitor the work of external contractors towards program requirements (Oct 2012 – June 2018)

! occurred during the COVID 19 pandemic, ^research leader, *lead author, &personnel supervised

- Worked as a visiting scientist with Dr. Ken Lohmann of the University of North Carolina at Chapel Hill to advance basic research on animal magnetic reception (Feb 2016 – June 2016, August 2016 – September 2016)
- Directed, drove, and developed research on bioinspired magnetic reception and multimodal sensing. Research thrusts include bioinspired and bio-based navigation algorithms and processing methods, and hardware testing. (Jan 2013 – June 2018)
- Supported one of the Air Force Research Laboratory's major long-range high velocity penetrator programs as a subject matter expert and program manager responsible for improving overall weapon system performance and accuracy. Worked with a team of Air Force and Industry partners to ensure that program cost, schedule and performance objectives were met. Presented the final results to government and industry partners. (Jan 2014 – Nov 2014)

Selected Honors

- Selected for the Case Western Reserve University Center for Innovation in Teaching and Education Learning Fellows
- 'Tanner Award for Excellence in Undergraduate Teaching from UNC Chapel Hill (2021)
- Selected to participate in Engineering Unleashed Faculty Learning Community (2020)
- Selected for the Air Force Office of Scientific Research (AFOSR) Visiting Scientist Program (2015)
- Co-Author for the CLAWAR Association Best Technical Paper Award (2011)
- One of 7 composers selected for the Greater Cleveland Flute Society's Composers Connection Concert (2011)
- Selected for the Science, Mathematics and Research for Transformation (SMART) Scholarship Program (2009-2012)
- Selected for the Department of Homeland Security (DHS) Scholarship and Fellowship Program (2006 - 2009)
- Accorded Honorable Mention in the NSF Graduate Research Fellowship Program (2006)
- Accorded Honorable Mention in the Ford Foundation Diversity Fellowship Program (2006)
- Awarded Case Western Reserve University Case Prime Fellowship (2005)
- Engineer Intern, State Board of Registration for Professional Engineers and Surveyors (2005)

Bibliography and Products of Scholarship

- *lead author, ^research/project leader, &student or personnel supervised
- All of my scholarly works are interdisciplinary as each one leverages various elements of biology and engineering
- Scholarship while at UNC Chapel Hill contains short descriptions of work and my role.

Books & Chapters (show author order and include pages)

- Fleissner G., Fleissner G., and **Taylor B.K***, "Magnetoreception", Encyclopedia of Animal Behavior (2nd ed) – 2019. Pgs 142-155 (<https://www.sciencedirect.com/referencework/9780128132524/encyclopedia-of-animal-behavior>)
 - Provides an overview of magnetoreception in animals. I authored a revision for the 2019 edition that focuses on computational efforts in the field, including my own.

Refereed papers/articles

1. Nichols ST[&], Gill JP[&], Mota B, Harley CM, **Taylor BK**, "Bioinspired Navigation Based on Distributed Sensing in the Leech Using Dynamic Neural Fields", To appear in the proceedings of the 2024 Living Machines Conference (<https://livingmachinesconference.eu/2024/posters/>)
2. Li R[&], Ngo Q[&], Gill J[&], Kehl CE[&], Taylor BK, "Bioinspired Magnetic Navigation for Exploring Celestial Bodies", To appear in the proceedings of the 2024 Living Machines Conference (<https://livingmachinesconference.eu/2024/oral-sessions/>)
3. Giang AT[&], **Taylor BK**, "Creating an Artificial No-Fly Zone with Sensory Disruptions", To appear in the proceedings of the 2024 Living Machines Conference (<https://livingmachinesconference.eu/2024/posters/>)
4. Piephoff, F[&], **B. K. Taylor**[^], C. E. Kehl[&], B. Mota and C. M. Harley (2024). "Biomechanics of transduction by mechanosensory cilia for prey detection in aquatic organisms." *Journal of Theoretical Biology* **583**: 111782. - <https://doi.org/10.1016/j.jtbi.2024.111782>

! occurred during the COVID 19 pandemic, ^research leader, *lead author, &personnel supervised

- a. Implemented a physics-based simulation of leech sensory hairs to study how sensory hairs and associated sensory neurons respond to different types of water wave stimuli.
5. Gill JP[&], **Taylor BK**[^], “Navigation by Magnetic Signatures in a Realistic Model of Earth’s Magnetic Field”, *Bioinspiration and Biomimetics* - <https://iopscience.iop.org/article/10.1088/1748-3190/ad3120>
 - a. Computational study of the feasibility of using magnetic signatures in different locations around the world
6. ¹Harvey, A[&], **Taylor, B.K.**[^] (2022). A Real-World Implementation of Neurally-Based Magnetic Reception and Navigation. In: , *et al.* *Biomimetic and Biohybrid Systems. Living Machines 2022. Lecture Notes in Computer Science*, vol 13548. Springer, Cham. https://doi.org/10.1007/978-3-031-20470-8_22
 - a. Implemented neurally based distributed sensing and processing for magnetoreception studies in a tethered robotic system.
7. ¹Nichols S[&], Havens LT, **Taylor BK**^{*^}, “Sensation to navigation: a computational neuroscience approach to magnetic field navigation” *J Comp Physiol A* (2022). <https://doi.org/10.1007/s00359-021-01535-w>
 - a. Supervised an undergraduate in adapting his honors thesis work that combines computational neuroscience and agent based modeling to test a hypothesized magnetic navigation strategy.
8. ¹Pizzuti S[&], Bernish M[&], Harvey A[&], Tourangeau LV[&], Shriver CD[&], Kehl CE[&], **Taylor BK**^{*^} “Uncovering how animals use combinations of magnetic field properties to navigate: a computational approach.” *J Comp Physiol A* (2021). <https://doi.org/10.1007/s00359-021-01523-0>
 - a. Perspective piece on my lab’s combined efforts on modeling, simulation, and robotics to study bio and bioinspired magnetoreception and navigation.
9. ¹O’Connell D.[&], Kehl CE[&], **Taylor BK**[^], Piacenza J, Piacenza S, Faller KJ II (2021). "A computational framework for studying energetics and resource management in sea turtle migration and autonomous systems." *Journal of Theoretical Biology*: 110815. <https://doi.org/10.1016/j.jtbi.2021.110815>
 - a. Mentored and assisted first graduate student in publishing her first journal paper as a PhD student. I led this interdisciplinary work that leverages previous magnetoreception work to study the potential effects of tracking tags on the energetics of migrating sea turtle. In this effort, I also led a team of interdisciplinary researchers at 3 different institutions.
10. ¹**Taylor BK**^{*^}, Bernish M[&], Pizzuti S[&], Kehl CE[&], (2021) “A bioinspired navigation strategy that uses magnetic signatures to navigate without GPS in a linearized northern Atlantic Ocean: a simulation study” –*Bioinspiration and Biomimetics* – <http://dx.doi.org/10.1088/1748-3190/abe7cd> (a)
 - a. Led an undergraduate, an undergraduate/research assistant, and postdoc on a paper that uses a simulation-based approach to study the hypothesis that turtles use magnetic signatures in a simplified but realistic Northern Atlantic Ocean
11. ¹**Taylor BK**^{*^}, Lohmann K, Lohmann CMF, Havens LT, Granger J, “Long-distance transequatorial navigation using sequential measurements of magnetic inclination angle.” *Journal of The Royal Society Interface*. 2021;18(174):20200887. (b)
 - a. Conceptualized and led the development and authorship of a study that used a computational approach as a means of testing and exploring the hypothesis that birds can use inclination angle as a means of transequatorial navigation. This study also demonstrated that the strategy could potentially be robust to magnetic field reversals.
12. ¹Nichols ST^{*&}, Kehl CE[&], **Taylor BK**[^], Harley C., “Bioinspired Navigation Based on Distributed Sensing in the Leech”, Presented at the peer reviewed conference *Living Machines, 2020*
 - a. This peer reviewed conference paper was based on the final paper of a biology 395 student that I supervised. Under my leadership, and in collaboration with a colleague, the student used an hybrid approach that combined simplified computational neuroscience methods with an agent-based-model to successfully reproduce behavior that is observed in real leeches.
13. **Taylor BK**^{*^}, Charbonneau C[&], Kehl CE[&], Piacenza JR, Piacenza SE, Faller J, “Energetic Analysis of Tagged Sea Turtles Using Geomagnetic Navigation”, Presented – International Navigation Conference (2019)

! occurred during the COVID 19 pandemic, ^research leader, *lead author, &personnel supervised

- a. Led a team of interdisciplinary researchers at 3 institutions, including a UNC undergraduate, to develop a peer-reviewed conference paper that combines my magnetoreception work with multi-objective optimization methods to study the potential effects of tracking tags on the energetics of migrating sea turtles.
14. **Taylor, B. K.*^** and S. Corbin[&] (2019). "Bioinspired magnetoreception and navigation in nonorthogonal environments using magnetic signatures." *Bioinspiration & Biomimetics* **14**(6): 066009. - doi 10.1088/1748-3190/ab40f8
 - a. Led and supervised an undergraduate Mechanical Engineering major (University of West Florida) in publishing a parametric study that used an abstracted but tunable environment to test the hypothesis that animals use magnetic signatures to navigate.
15. Huang G, **Taylor BK** and Akopian D, "A Low-Cost Approach of Magnetic Field-Based Location Validation for Global Navigation Satellite Systems," in *IEEE Transactions on Instrumentation and Measurement*, vol. 68, no. 12, pp. 4937-4944, Dec. 2019, doi: 10.1109/TIM.2019.2901512.
 - a. Coauthor on a paper that explores using magnetic field information validation/health checking tool for Global Navigation Satellite Systems (GNSS)
16. **Taylor, B.K.*^**. "Bioinspired Magnetoreception and Navigation Using Magnetic Signatures as Waypoints", *Bioinspiration and Biomimetics*, Vol 13, no 4, 14 May 2018 (Featured Article) - <https://doi.org/10.1088/1748-3190/aabbc>
17. **Taylor, B.K.*^**, "Bioinspired magnetic reception and multimodal sensing." *Biological Cybernetics*, 2017. **111**(3): p. 287-308. <https://doi.org/10.1007/s00422-017-0720-3>
18. **Taylor, B.K.*^**, Johnsen, S., Lohmann, K.J., "Detection of magnetic field intensity using distributed sensing: a computational neuroscience approach". *Bioinspiration and Biomimetics*, Vol 12, no 3, 19 May 2017 (Featured Article) - <https://doi.org/10.1088/1748-3190/aa6ccd>
19. **Taylor, B.K.*^**, "Validating a model for detecting magnetic field intensity using dynamic neural fields" *Journal of Theoretical Biology*, Available online 10 August 2016, ISSN 0022-5193, <http://dx.doi.org/10.1016/j.jtbi.2016.08.010>.
20. **Taylor, B.K.*^**. and G. Huang, "Bioinspired Magnetic Navigation Using Magnetic Signatures as Waypoints", in *Biomimetic and Biohybrid Systems: 6th International Conference, Living Machines 2017, Stanford, CA, USA, July 26–28, 2017, Proceedings*, M. Mangan, et al., Editors. 2017, Springer International Publishing: Cham. p. 48-60.
21. Huang, G., **Taylor B.K.*^**, "Engineered and bioinspired approaches to magnetic navigation". Presented at the ION 2017 Pacific PNT Meeting, Honolulu, HI, May 2017
22. **Taylor, B.K.***, Wu, D., Willis, M.A., Quinn, R.D. "Maintaining Odor Tracking Behavior Using an Established Tracking Direction in a Dynamic Wind Environment". *Proceedings of the International Conference on Robotics and Automation (ICRA) 2012*.
23. Rutter, B.L., **Taylor, B.K.**, Quinn, R.D., Lewinger, W.A., Bender, J.A., Ritzmann, R.E., Blumel, M., "Descending Commands to an Insect Leg Controller Network Cause Smooth Behavioral Transitions", *Proceedings of the International Conference on Intelligent Robots and Systems (IROS), 2011*.
24. **Taylor, B.K.***, Willis, M.A., Quinn, R.D. "Integrating olfaction, vision and touch to locate fluid-borne odors in diverse and dynamic environments". *1st International Conference on Applied Bionics and Biomechanics, 2010*.
25. **Taylor, B.K.***, Balakirsky, S., Messina, E., Quinn, RD., "Analysis and Benchmarking of a Whegs™ Robot in the USARSim Environment," *Proceedings of IROS 2008*

! occurred during the COVID 19 pandemic, ^research leader, *lead author, &personnel supervised

Refereed unpublished oral presentations and/or abstracts

1. ^{!Taylor BK}^, Harvey AJ[&], Tourangeau L[&], O'Connell D[&], Kehl CE[&] “Bioinspired magnetic navigation via magnetic signatures using real-world robots”, Accepted to the 2021 Adaptive Motions in Animals and Machines (AMAM) Conference (c)
 - a. I led the development of a peer-reviewed abstract and poster that highlights our work on using mobile and tethered robots as novel research tools to study animal magnetoreception.

Conference Presentations

- P: presented by me, SP: presented by a student that I directly mentor or supervise, JP: jointly presented
- ^{!SP}O'Connell DC[&], Kehl CE[&], Taylor, BK, Piacenza, J, Piacenza, S, Faller II, KJ, **Taylor BK**, “Simulation and analysis of the impact of different satellite tracking tags on the energetics and resource management behavior of migrating sea turtles”. Presented for the annual meeting of The Society for Integrative and Comparative Biology.
- ^{!SP}Piephoff F[&], Kehl CE[&], Taylor BK, Harley CM, Mota B. “Biophysical modeling of mechanosensation in the leech”. Presented for the annual meeting of The Society for Integrative and Comparative Biology.
- ^{!Havens} LT; ^{!Notar} JC; **Taylor BK**; Lohmann KJ, “Bridging the gap between theory and behavior in magnetoreception”. Presented for the annual meeting of The Society for Integrative and Comparative Biology.
- ^{!SP}Piephoff F[&], **Taylor BK**^, Kehl CE[&], Harley, C, Mota B, “Computational Modeling of Mechanoreception in the Leech”. Presented at the Triangle Chapter Society for Neuroscience Meeting (April 22, 2021)
- ^{!Havens} LT, **Taylor BK**, Lohmann KJ, “Studying a black box: investigating processing of a receptorless sense”, Presented at the Annual SICB Meeting (January 2, 2021)
- ^{!SP}Nichols S[&], **Taylor BK**^, Kehl CE[&], Harley, “Bioinspired Navigation based on Distributed Sensing in the Leech”, Presented for the 2020 Southeast Regional SICB Meeting (November 14, 2020)
- ^{!SP}O'Connell D[&], Kehl CE[&], **Taylor BK**^, “Modeling the effects of satellite tracking tags on energy use and resource management behavior in sea turtles”, Presented for the 2020 Southeast Regional SICB Meeting (November 14, 2020)
- ^{!SP}Bernish M[&], Pizzuti S[&], Kehl CE[&], **Taylor BK**^, “Using Magnetic Signatures to Navigate the North Atlantic.”, Presented for the 2020 Southeast Regional SICB Meeting (November 14, 2020)
- ^{!SP}Harvey AJ[&], Kehl CE[&], **Taylor BK**^, “Caretta2: A Software Platform for Magnetoreception and Navigation Research.”, Presented for the 2020 Southeast Regional SICB Meeting (November 14, 2020)
- ^{!Taylor, B.K}^., Kehl, C.E[&]. “ Bioinspired trans-equatorial navigation using sequential measurements of magnetic inclination”. Presented at the annual meeting of The Society for Integrative and Comparative Biology. Austin, Texas, 1/4/2020
- ^{!Taylor, B.K}^., Kehl, C.E[&]. “ A bioinspired navigation strategy that uses magnetic signatures to navigate without GPS in the Northern Atlantic”. Presented at the annual meeting of The Society for Integrative and Comparative Biology. Austin, Texas, 1/4/2020
- ^{!JP}Corbin S[&]., **Taylor, B.K**^., " Bioinspired Magnetoreception and Navigation Using Magnetic Signatures in Nonorthogonal Environments ". Presented at the annual of The Society for Integrative and Comparative Biology. Tampa, Florida, 1/5/2019
- ^{!Taylor, B.K}^., Lohmann K.J., "Validating a model for detecting magnetic field intensity using simulated and hardware approaches". Presented at the annual of The Society for Integrative and Comparative Biology. New Orleans, Louisiana, 1/7/2017

! occurred during the COVID 19 pandemic, ^research leader, *lead author, &personnel supervised

- **P^{Taylor, B.K.}***, "Validating a model for detecting magnetic field intensity using dynamic neural fields". Presented at the 4th Annual Meeting of the Air Force Research Laboratory Mathematical Modeling Institute at the University of Florida Research Engineering and Education Facility (UF-REEF), Shalimar, Florida, 7/27/2016
- **P^{Taylor, B.K.}^**, Rutkowski, A.J., "Bio-inspired Magnetic Field Sensing and Processing". Presented at the 3rd Annual Meeting of the Air Force Research Laboratory Mathematical Modeling Institute at the University of Florida Research Engineering and Education Facility (UF-REEF), Shalimar, Florida, 7/30/2015
- **P^{Taylor, B.K.}^**, "Bioinspired Magnetic Reception and Multimodal Sensing", Presented for the 2nd Annual Meeting of the Air Force Research Laboratory Mathematical Modeling Institute at the University of Florida Research Engineering and Education Facility (UF-REEF), Shalimar, Florida, 7/30/2014
- Chen, R., **Taylor, B.K.**, Avondet, J., Willis, M., Quinn, R., "Using a Robotic Platform to Understand Moth Flight Orientation", *Research ShowCASE*, Cleveland OH, April 2013
- **P^{Taylor, B.K.}***, Quinn, R.D., Willis, M.A., "Tracking Fluid-Borne Odors in Dynamic Environments with Animals and Robots". Presented at the Tenth International Congress of Neuroethology (August 2012).
- **P^{Taylor, B.K.}***, Willis, M.A., Quinn, R.D. "Multi-Modal Sensing Enables an Agent to Track a Fluid-Borne Odor to its Source". *Research ShowCASE*, Cleveland, OH., April 2010
- **P^{Taylor, B.K.}***, Rutter, B.L., Willis, M.A., Quinn, R.D. "Using Sensory Coupled Action Switching Modules to Track a Wind-Borne Odor". *Research ShowCASE*, Cleveland, OH., April 2009
- Rutter, B.L., Bender J.A., **Taylor, B.K.**, Ritzmann, R.E., Quinn, R.D. (2008) "Experiments in Locomotion with Neuromechanically Based Robotic Insect Models" Soc. Neuroci. Abstr. 198.7.
- **P^{Taylor, B.K.}***, Balakirsky, S., Messina, E., Quinn, R.D., "Using Biological Analysis Tools to Study the Behavior of a Whegs Robot," Fourth International Symposium on Adaptive Motion of Animals and Machines, 2008
- **P^{Taylor, B.K.}***, Witushynsky, T.C., Bachmann, R.J., Quinn, R.D. "Design of a Micro Air Vehicle with Wing Folding Capabilities". *Research ShowCASE*, Cleveland, OH., April 2010
- Rutter BL, **Taylor B.K.**, Mu L, Ritzmann RE (2007) "A Functional Kinematic Model of the Cockroach Mesothoracic Leg," International Congress of Neuroethology, Vancouver, Canada, Abstract P0232
- Rutter, B.L., Lewinger, W., **Taylor, B.K.**, Wilson, M., Blümel, M., Ekeberg, Ö., Büschges, A., Ritzmann, R.E., Quinn, R.D. (2006) "Neurally-Based Robot Control for Neuromechanical Modeling of Insect Stepping," Soc. Neuroci. Abstr. CD ROM 32: 449.13.
- Rutter, B.L., Mu L., **Taylor, B.K.**, Quinn, R.D., Ritzmann, R.E., (2006) A Model that Transforms Insect Electromyograms into Pneumatic Muscle Control. *Research ShowCASE*, Cleveland, OH April 6
- Mu, L., **Taylor, B.K.**, Rutter, B.L., Ritzmann, R.E. (2006) Altered joint reflexes in the cockroach may lead to directional changes in leg extension. Soc. Neuroci. Abstr. CD ROM 32: 449.11.

Invited Talks and Lectures

- "Bio and Bioinspired Magnetic Reception and Multimodal Sensing". Plenary Talk for the 2024 Living Machines Conference in Chicago, IL (<https://livingmachinesconference.eu/2024/plenary-speakers/>), Wednesday, July 10, 2024
- "Bio and Bioinspired Magnetic Reception and Multimodal Sensing". Presented for the Department of Biology at Case Western Reserve University – Thursday, October 12, 2023

! occurred during the COVID 19 pandemic, ^research leader, *lead author, &personnel supervised

- “Bio and Bioinspired Magnetic Reception and Multimodal Sensing”. Presented for the Modeling, Computation, Nonlinearity, Randomness and Waves Seminar at The University of Arizona via. Zoom – Thursday, October 7, 2021
- “Bio and Bioinspired Magnetic Reception and Multimodal Sensing”. Presented for The Department of Mechanical and Aerospace Engineering of Case Western Reserve University – Friday, September 17, 2021
- “Bio and Bioinspired Magnetic Reception and Multimodal Sensing”. Presented as part of the Bioinspiration and Biodiversity Workshop – April 19, 2021
- “Bio and Bioinspired Magnetic Reception and Multimodal Sensing”. Presented for The Department of Mechanical and Aerospace Engineering of North Carolina State University – March 26, 2021
- “Bio and Bioinspired Magnetic Reception and Multimodal Sensing”. Presented for The University of Florida Whitney Laboratory – October 9, 2020
- “Bio and Bioinspired Magnetic Reception and Multimodal Sensing”. Presented for a University of North Carolina at Chapel Hill First Year Seminar “Exploring Engineering” – September 23, 2020
- “Bio and Bioinspired Magnetic Reception and Multimodal Sensing”. Presented for a University of North Carolina at Chapel Hill First Year Seminar “Robots in Science Fiction” – January 29, 2020
- “Bio and Bioinspired Magnetic Reception and Multimodal Sensing”. Presented at Metropolitan State University – September 26, 2019
- “Using Sea Turtle Navigation as Inspiration for Novel Human Navigation Systems”, Presented at the 2019 International Sea Turtle Symposium, Charleston North Carolina, February 6, 2019

Popular Media

- Online Article: Nature’s Compass <https://endeavors.unc.edu/natures-compass/> (author – Megan May – February 18 2021)

Teaching Activities

- &student or personnel has published and/or given a scholarly presentation
- !During pandemic

Courses

¹Advanced Dynamics I (EMAE 481) 01/16/2024 – 05/19/2024
Case Western Reserve University Cleveland, OH

- Sole instructor for course aimed at covering Newtonian mechanics, and elements of analytical mechanics
- 9 Students

¹Control of Mechanical Systems (EMAE 351) 08/28/2023 – 12/22/2023
Case Western Reserve University Cleveland, OH

- Sole instructor for undergraduate course aimed at covering classical controls
- Course involves mathematical modeling, transfer functions, stability analysis, and various control analysis and design techniques
- 30 Students

¹Advanced Dynamics I (EMAE 481) 01/17/2023 – 05/13/2023
Case Western Reserve University Cleveland, OH

- Sole instructor for course aimed at covering Newtonian mechanics, and elements of analytical mechanics

! occurred during the COVID 19 pandemic, ^research leader, *lead author, &personnel supervised

- 18 Students

¹Instructor for Mathematical Modeling for Quantitative Biology (BIOL 226/L) 08/15/2022 – 12/11/2022
University of North Carolina at Chapel Hill Chapel Hill, NC

- Sole instructor for course and lab aimed at introducing students to various concepts and methods in quantitative biology, particularly as they apply to medical applications. Topics included: Random Walks, Diffusion, Genetic Algorithms, Biochemical Kinetics, Computational Neuroscience, Muscle Mechanics, Robotics as applied to medicine
- Course involves mathematical application, computer programming fundamentals, development of basic computer programs that leverage mathematics to solve problems, and a semester-long coding assignment
- Teaching Innovation: Invited radiation oncologist to discuss her use of mathematics on the front lines of medicine.
- 20 Students with TA for labs

¹Instructor for Introduction to Computational Neuroscience (BIOL 554) 1/10/2022 – 5/05/2022
University of North Carolina at Chapel Hill Chapel Hill, NC

- Developer and sole instructor for a course aimed at introducing students to mathematical tools and techniques for modeling the various elements and phenomena that comprise the nervous system and brain.
- Course involves mathematical application, and development of computer programs that leverage mathematics to solve problems
- Teaching Innovation: Invited guest lecturer and computational neuroscience researcher to discuss their research and how the material covered is actually employed in the course of research.
- 23 students

¹Instructor for Introduction to Computational Neuroscience (BIOL 554) 1/19/2021 – 5/12/2021
University of North Carolina at Chapel Hill Chapel Hill, NC

- Developer and sole instructor for a course aimed at introducing students to mathematical tools and techniques for modeling the various elements and phenomena that comprise the nervous system and brain.
- Course involves mathematical application, and development of computer programs that leverage mathematics to solve problems
- Teaching Innovation: Invited guest lecturer and computational neuroscience researcher to discuss his research and how the material covered is actually employed in the course of research.
- 15 students

¹Instructor for Mathematical Modeling for Quantitative Biology (BIOL 226/L) 08/10/2020 – 11/25/2020
University of North Carolina at Chapel Hill Chapel Hill, NC

- Sole instructor for course and lab aimed at introducing students to various concepts and methods in quantitative biology, particularly as they apply to medical applications. Topics included: Random Walks, Diffusion, Genetic Algorithms, Biochemical Kinetics, Computational Neuroscience, Muscle Mechanics, Robotics as applied to medicine
- Course involves mathematical application, computer programming fundamentals, development of basic computer programs that leverage mathematics to solve problems, and a semester-long coding assignment
- Teaching Innovation: Invited radiation oncologist to discuss her use of mathematics on the front lines of medicine.
- 20 Students with TA for labs

¹Instructor for Introduction to Computational Neuroscience (BIOL 590) 01/09/2020 – 05/10/2020
University of North Carolina at Chapel Hill Chapel Hill, NC

- Developer and sole instructor for a course aimed at introducing students to mathematical tools and techniques for modeling the various elements and phenomena that comprise the nervous system and brain.
- Course involves mathematical application, and development of computer programs that leverage mathematics to solve problems
- Transitioned course to online learning due to COVID-19 pandemic
- 15 students

! occurred during the COVID 19 pandemic, ^research leader, *lead author, &personnel supervised

Instructor for Mathematical Modeling for Quantitative Biology (BIOL 226/L) 08/20/2019 – 12/12/2019
University of North Carolina at Chapel Hill Chapel Hill, NC

- Sole instructor for course and lab aimed at introducing students to various concepts and methods in quantitative biology, particularly as they apply to medical applications. Topics included: Random Walks, Diffusion, Genetic Algorithms, Biochemical Kinetics, Computational Neuroscience, Muscle Mechanics, Robotics as applied to medicine
- Course involves mathematical application, computer programming fundamentals, and development of basic computer programs that leverage mathematics to solve problems, and a semester-long coding assignment
- Teaching Innovation: Invited radiation oncologist to discuss her use of mathematics on the front lines of medicine. Resulted in two students from the course working for her as research interns. One did independent research, the other is using the research opportunity for honors research credit.
- 22 Students

Instructor for Mathematical Modeling for Quantitative Biology (BIOL 226/L) 01/09/2019 – 04/30/2019
University of North Carolina at Chapel Hill Chapel Hill, NC

- Sole instructor for course and lab aimed at introducing students to various concepts and methods in quantitative biology including: Random Walks, Diffusion, Genetic Algorithms, Biochemical Kinetics, Computational Neuroscience, Muscle Mechanics, Stochastic Simulation of Chemical Reactions.
- Course involves mathematical application, computer programming fundamentals, and development of basic computer programs that leverage mathematics to solve problems
- 30 students

Graduate Students Supervised

^{!&}**Faye Piephoff (Biology - CWRU)** 01/01/2023 – Present
Case Western Reserve University Cleveland, OH

- Using computational neuroscience and physics-based modeling to investigate distributed sensing in the Leech

[!]**Andrew Giang (Biology - CWRU)** 01/01/2023 – 06/07/2024
Case Western Reserve University Cleveland, OH

- Used computational approaches to investigate novel approaches to preventing birds from striking buildings in cities

[!]**Robert Steward (Mechanical and Aerospace Engineering - CWRU)** 01/01/2023 – Present
Case Western Reserve University Cleveland, OH

- Biologically inspired control

[!]**Kaiwen Zuo (Mechanical and Aerospace Engineering - CWRU)** 05/01/2023 – Present
Case Western Reserve University Cleveland, OH

- Vision based force estimation for a robotic gripper

^{!&}**Delaney O'Connell (Biology – UNC Chapel Hill)** 01/10/2021 – 5/8/2022
University of North Carolina at Chapel Hill Chapel Hill, NC

- Recipient of NSF GRFP award
- Adaptability of magnetoreception strategies to temporal changes
- Resource management and energetics in animal migration

CWRU Undergraduate Students Supervised

Miles Miller: Undergraduate Major: Mechanical Engineering and Music 04/1/2024 - Present
Case Western Reserve University Cleveland, OH

- Coadvising with Professor Zonghe Chua (CWRU electrical engineering) to develop a novel haptics-based musical keyboard

Grant Boone: Undergraduate Major: Mechanical Engineering 04/1/2024 - Present
Case Western Reserve University Cleveland, OH

- Coadvising with Professor Zonghe Chua (CWRU electrical engineering) to develop a novel haptics-based musical keyboard

! occurred during the COVID 19 pandemic, ^research leader, *lead author, &personnel supervised

Alvin Cheng

Case Western Reserve University

03/1/2023 - 01/01/2024
Cleveland, OH

- Using agent based modeling to study applications of bioinspired navigation for navigation and exploration of other planets
- Designed artificial magnetic environment for research use

UNC Undergraduate Students Supervised

¹&Quynh Ngo: Undergraduate Major: Biology
University of North Carolina at Chapel Hill

01/10/2022 –05/15/2023
Chapel Hill, NC

- Using agent based modeling to study applications of bioinspired navigation for navigation and exploration of other planets
- Summer 2022: BIOL 395
- Spring 2022: Biology Intern

¹&Jacqueline Gu: Undergraduate Major: Quantitative Biology
University of North Carolina at Chapel Hill

08/18/2021 – 05/8/2022
Chapel Hill, NC

- Used computational neuroscience to understand distributed visual sensing and processing in the Leech
- Spring 2022: BIOL 395
- Fall 2021: Biology Intern

¹&Sebastian Nichols: Undergraduate Major: Quantitative Biology
University of North Carolina at Chapel Hill

08/26/2019 – 05/14/2021
Chapel Hill, NC

- Using computational neuroscience to understand distributed sensing and processing in the Leech
- ¹Awarded the Robert Coker Award for excellence in research in Organismal Biology and Ecology.
- ¹Awarded Highest Honors upon graduation
- ¹Honors Thesis Title: Bioinspired Navigation Base on Distributed Sensing in the Leech using Dynamic Neural Fields
- ¹Summer 2020: BIOL 395 – Recipient of Summer Award for Research-Intensive Courses (SARIC) for Undergraduate Research for Summer 2020
- ¹& Spring 2020: BIOL 395 – Work led to submission of a peer-reviewed conference paper
- Fall 2019: Biology Intern

¹&Susan Pizzuti: Undergraduate Major: Quantitative Biology
University of North Carolina at Chapel Hill

05/15/2020 – 06/31/2022
Chapel Hill, NC

- Application of dynamical systems analysis to magnetic migration strategies for the north Atlantic ocean
- Intern (Summer 2021)
- Work Study (Fall 2020 and Spring 2021)
- 2020 Science and Math Achievement and Resourcefulness Track (SMART) student (Summer 2020)

¹Ashley Ruhashya: Undergraduate Major: Biology
University of North Carolina at Chapel Hill

01/17/2020 – 05/10/2020
Chapel Hill, NC

- Indirectly mentored student during her independent research that she performed under the direction and supervision of Dr. Colette Shen at UNC Hospitals for independent research credit.

¹&Delaney O'Connell: Undergraduate Major: Quantitative Biology
University of North Carolina at Chapel Hill

01/17/2020 – 05/10/2020
Chapel Hill, NC

- Development and modification of code for studying the effects of tracking tags on turtle energetics and ecology.
- ¹&Work during 2020 and early 2021 led to the publication of a journal paper

¹&Andrew Harvey: Undergraduate Major: Biology/Computer Science
University of North Carolina at Chapel Hill

05/16/2019 – 05/10/2020
Chapel Hill, NC

! occurred during the COVID 19 pandemic, ^research leader, *lead author, &personnel supervised

- ^Development of software to control a magnetic navigation testing environment and tethered robot. Partially supervised through an Honors Thesis for Computer Science (A – Graduation with Highest Honors).
- Student Employee during Summer 2019
- Honors thesis work during Fall 2019 and ^Spring 2020

!&Maggie Bernish: Undergraduate Major: Quantitative Biology 08/26/2019 – 05/10/2020
University of North Carolina at Chapel Hill Chapel Hill, NC

- Application of dynamical systems analysis to magnetic migration strategies for the north Atlantic ocean
- !& Spring 2020: BIOL 395 (A) – work during the Spring 2020 semester led to journal paper authorship
- Fall 2019: Biology Intern

&Casey Charbonneau: Undergraduate Major: Quantitative Biology 05/16/2019 – 07/29/2019
University of North Carolina at Chapel Hill Chapel Hill, NC

- Development and modification of code for studying the effects of tracking tags on turtle energetics and ecology
- &Contributor to peer reviewed conference paper (cowrote introduction and methods)
- Now employed at *Aerotek*

JR Elliot: Undergraduate Major: Biomedical Engineering 02/15/2019 – 05/12/2019
University of North Carolina at Chapel Hill Chapel Hill, NC

- Analyzed historic and predictive modeled magnetic field data from an animal perspective
- Now employed at *Allscripts*

Nomi Topasna: Undergraduate Major: Biomedical Engineering 02/01/2019 – 05/12/2019
University of North Carolina at Chapel Hill Chapel Hill, NC

- Developed a more advanced vehicle model of an agent that navigates using magnetic signatures
- Now employed at *Aerotek*

Other Personnel Supervised (includes students that worked in employment capacity)

Bold indicates direct supervision or mentorship

^Dr. Jeffery Gill (Ph.D. – Biology: Case Western Reserve University) 01/01/2023 – Present
Case Western Reserve University Cleveland, OH

- Research associate assisting with research, lab management, and facility setup. Active contributor on proposals and papers.

^Vishal Shah 09/01/2023 – Present
Case Western Reserve University (01/01/2023 – Present) Cleveland, OH

- Using agent based modeling to study applications of bioinspired navigation for navigation and exploration of other planets
- University of North Carolina at Chapel Hill – Remote supervision (Applied Mathematics – Class of 2025)

Renzi Li 09/01/2023 – Present
Case Western Reserve University (01/01/2023 – Present) Cleveland, OH
University of North Carolina at Chapel Hill (09/01/2022 – 12/31/2022) Chapel Hill, NC

- Using agent based modeling to study applications of bioinspired navigation for navigation and exploration of other planets
- University of Southern California – Remote supervision (Electrical Engineering – Class of 2025)

&!Dr. Catherine Kehl (Ph.D. – Biology: Case Western Reserve University) 07/01/2019 – 06/30/2024
University of North Carolina at Chapel Hill Chapel Hill, NC

- Modeling and simulation of animal magnetic navigation from behavioral and neural perspectives, and general laboratory assistance.
- Development of programming course aimed at biology students with no previous programming background
- Active contributor to peer reviewed papers and proposals
- New Job: Faculty member at The Evergreen State College in Olympia, Washington (To start in September 2024)

! occurred during the COVID 19 pandemic, ^research leader, *lead author, &personnel supervised

- !&JaNya Brown:** Research Intern 06/01/2020 – 08/06/2021
University of North Carolina at Chapel Hill Chapel Hill, NC
- Developed preliminary generalized agent-based modeling tool for studying animal navigation
 - York College of Pennsylvania Undergraduate (Forensic Chemistry – Class of 2024)
- !&Faye Piephoff:** Research Associate 05/18/2020 – 12/31/2022
University of North Carolina at Chapel Hill Chapel Hill, NC
- Using computational neuroscience and physics-based modeling to investigate distributed sensing in the Leech
 - Hired after taking BIOL 590 with me in Spring 2020
 - Hired upon graduation (UNC Class of 2020 – B.A. Biology)
- !Cassandra Shriver:** Research Associate 05/18/2020 – 05/02/2021
University of North Carolina at Chapel Hill Chapel Hill, NC
- Developed dynamics simulation to study the effects of tracking tags on turtle energetics and ecology
 - Duke University Undergraduate (Mechanical Engineering – Class of 2021)
- !&Delaney O’Connell:** Research Associate 05/11/2020 – 01/18/2021
University of North Carolina at Chapel Hill Chapel Hill, NC
- Development and modification of code for studying the effects of tracking tags on turtle energetics and ecology.
 - Hired upon graduation (UNC Class of 2020 – B.S. Quantitative Biology)
- !Andrew Harvey:** Research Associate 05/11/2020 – 06/30/2021
University of North Carolina at Chapel Hill Chapel Hill, NC
- Development of software to control a magnetic navigation testing environment. Partially supervising through an Honors Thesis for Computer Science.
 - Hired upon graduation (UNC Class of 2020 – B.S. Biology and Computer Science)
- !&Maggie Bernish:** Research Associate 05/11/2020 – 06/30/2021
University of North Carolina at Chapel Hill Chapel Hill, NC
- Application of dynamical systems analysis to magnetic migration strategies for the north Atlantic ocean
 - Hired upon graduation (UNC Class of 2020 – B.S. Quantitative Biology)
- !Luc Tourangeau:** Research Associate 06/03/2019 – 06/30/2021
University of North Carolina at Chapel Hill Chapel Hill, NC
- Mobile Robot development for magnetic navigation research
- Nomi Topasna:** Undergraduate Major: Biomedical Engineering 05/13/2019 – 07/15/2019
University of North Carolina at Chapel Hill Chapel Hill, NC
- Tethered robot development for magnetic navigation research
 - Now employed at *Aerotek*
- Sabrina Corbin:** Undergraduate Major: Mechanical Engineering 05/21/2018 – 07/27/2018
Air Force Research Laboratory Eglin Air Force Base, FL
- Explored the effects of different environmental conditions and strategy parameters on the performance of a bioinspired magnetic navigation algorithm. Nominated for the AFRL Scholars “Outstanding Scholar” award.
- Ryan Murphey:** High School Student 09/1/2017 – 06/29/2018
Air Force Research Laboratory Eglin Air Force Base, FL
- Mentoring a high school student through his externship to give him exposure to various engineering fields.
- Sharon Maguire:** Undergraduate Major: Mechanical Engineering 05/22/2017 – 07/28/2017
Air Force Research Laboratory Eglin Air Force Base, FL

! occurred during the COVID 19 pandemic, ^research leader, *lead author, &personnel supervised

- Designed and began initial construction on a 10x10x10ft artificial magnetic environment for laboratory magnetic navigation experiments. Upon my recommendation, Sharon was one of the recipients of the AFRL Scholars "Outstanding Scholar" award.

Christian Clark: High School Student 05/22/2017 – 07/28/2017
Air Force Research Laboratory Eglin Air Force Base, FL

- Implemented multiple biologically plausible magnetic navigation algorithms in simulation. Nominated for the AFRL Scholars "Outstanding Scholar" award.

Gannon Woods: High School Student 09/01/2014 – 08/14/2015
Air Force Research Laboratory Eglin Air Force Base, FL

- Assisted a co-worker in mentoring a high school student through his externship to give him exposure to various engineering fields

Brian Ortiz-Munoz: Undergraduate Major – Aerospace Engineering 06/08/2015 – 8/14/2015
Air Force Research Laboratory Eglin Air Force Base, FL

- Developed a software simulation of an artificial magnetic environment. Validated the simulation against that of a real world artificial magnetic environment. Upon my recommendation, Brian was one of three recipients of the AFRL Scholars "Outstanding Scholar" award.

Spencer Mickus: High School Student 06/01/2015 – 8/5/2015
Air Force Research Laboratory Eglin Air Force Base, FL

- Took data to characterize and improve an artificial magnetic environment built for magnetic navigation testing

Jamie Barnes: High School Student 09/01/2014 – 08/14/2015
Air Force Research Laboratory Eglin Air Force Base, FL

- Assisted a co-worker in mentoring a high school student through her externship to give her exposure to various engineering fields

Shang-Shang Chen: High School Student 04/06/2012 – 08/29/2012
Case Western Reserve University Cleveland, OH

- Developed software to allow an odor tracking robot to use moth antennae as odor sensors to aid in biological studies.

Dora Wu: Undergraduate Majors – Mechanical Engineering and Music (Violin Performance) 05/17/2011 – 08/01/2011
Case Western Reserve University Cleveland, OH

- Took data from and assisted in repairing a 3D odor tracking robot.

Graduate Committees

¹Kaiwen Zuo (Mechanical and Aerospace Engineering) 05/01/2023 – 06/07/2024
Case Western Reserve University Cleveland, OH
Student successfully defended on 05/31/2024

¹Andrew Giang: Biology (Advisor: Dr. Brian Taylor) - MS 01/01/2023 – 06/07/2024
Case Western Reserve University
Student successfully defended on 05/01/2024

¹Karina D'Souza: Biomedical Engineering (Advisor: Dr. Dustin Tyler) - MS 09/01/2023 – 12/22/2023
Case Western Reserve University
Student successfully defended on 12/06/2023

¹Delaney O'Connell: Biology (Advisor: Dr. Maria Servedio) - PhD 07/01/2022 – Present
University of North Carolina at Chapel Hill

¹Hazel (formerly Luke) Havens: Biology (Advisor: Dr. Kenneth Lohmann) - PhD 03/20/2020 – Present
University of North Carolina at Chapel Hill Chapel Hill, NC

! occurred during the COVID 19 pandemic, ^research leader, *lead author, &personnel supervised

Named as committee chair

Yang Chen: Mechanical and Aerospace Engineering (Advisor: Dr. Kathryn Daltorio) – PhD Fall 2022

Case Western Reserve University

Michael Senter: Mathematics (Advisor – Dr. Laura Miller) - PhD

04/17/2020 – 05/10/2021

University of North Carolina at Chapel Hill (Mathematics)

Chapel Hill, NC

- Student successfully defended PhD thesis on 04/07/2021

Grants/Funding Obtained and Pending

- “CAREER: Sensation to Navigation – An interdisciplinary computational approach for magnetoreception” – NSF (July 2024 – Pending - \$719,998)
- “Neural Processing for Magnetoreception and Navigation” – AFOSR (November 2023 – Pending – \$560,000)
- “Development of Biologically Inspired GPS-Free Navigation” PI for UNC Idea Grant (**\$18,733**). Collaborators: Dr. Kenneth Lohmann (Charles Postelle Distinguished Professor), Dr. Catherine Kehl (Postdoctoral Researcher), Mr. Luke Havens (Graduate Researcher) – **Awarded – July 2020**. Funding will support animal field work, and the development of novel sensors using commercial-off-the-shelf products.
- “Magnetoreception in Marine Animals and Bio-Inspired Algorithms for Long-range, GPS-free Navigation” Co-PI with Drs. Kenneth Lohmann (UNC Chapel Hill), and Sonke Johnsen (Duke University) for AFOSR Grant FA9550-20-1-0399 **\$2,500,000 total – \$333,350 direct to Taylor Lab for postdoc support, graduate student support, and 1 month summer salary per year**. September 30 2020 – September 29 2025
- “Sparse Coding of Magnetic Fields for Location” as Co PI (**\$125,000 – All towards equipment and funding a postdoc**). Award from the Chief Scientist Innovative Research Fund to explore neuromorphic and computational neuroscience approaches to using the magnetic field as a navigational signal
- “Bioinspired Magnetosensing and Sensory Integration” as PI (**\$17,000 – all for equipment**). Award from the Chief Scientist Innovative Seedling Fund to construct an automated 3-axis artificial magnetic environment for biological and bioinspired magnetic navigation testing.
- Selected for the Air Force Office of Scientific Research (AFOSR) Visiting Scientist Program to collaborate with Dr. Ken Lohmann of the University of North Carolina at Chapel Hill (~**\$23,000.00 – For travel costs – Started on February 1, 2016**). The collaboration will focus on exploring magnetic and multimodal reception and navigation in animals, and the application of magnetic and multimodal reception in engineered systems.
- "Differential Geometric Trajectory Shaping for Enhanced Navigation Performance" as Co PI (**\$20,000.00 – For equipment**). Award from the office of the Chief Scientist of the Air Force Research Laboratory Munitions Directorate for beginning research efforts, April 2014.
- "Bio-inspired Magnetosensing and Sensory Integration" as PI (**\$17,000.00 – for equipment**). Award from the Venture Capital and Chief Scientist Fund, office of the Chief Scientist of the Air Force Research Laboratory Munitions Directorate, November 2013

Professional Service

Departmental and University Engagement

Case College of Arts and Sciences Dean Search Committee

01/01/2024 – Present

Case Western Reserve University

Cleveland, OH

- Assisting with identifying and recruiting a faculty member to serve as the Dean for CWRU College of Arts and Sciences

! occurred during the COVID 19 pandemic, ^research leader, *lead author, &personnel supervised

Case Western Reserve University Academic Integrity Board Case Western Reserve University	01/01/2024 – Present Cleveland, OH
<ul style="list-style-type: none">Helps adjudicate alleged academic integrity violations	
Mechanical Engineering Controls Faculty Search Committee Case Western Reserve University	01/05/2023 – 5/19/2023 Cleveland, OH
<ul style="list-style-type: none">Assisting with identifying and recruiting a faculty member for the Department of Mechanical and Aerospace Engineering in the area of controls	
Materials Science and Engineering Materials Manufacturing Faculty Search Committee Case Western Reserve University	01/05/2023 – 5/19/2023 Cleveland, OH
<ul style="list-style-type: none">Assisting with identifying and recruiting a faculty member for the Department of Materials Science and Engineering in the area of materials manufacturing	
¹ Departmental presentation strategy University of North Carolina at Chapel Hill	01/05/2021 Chapel Hill, NC
<ul style="list-style-type: none">Assisting with development of internal communication tools to better present and highlight the strengths and viability of particular sections within the department.	
¹ Spring Advisory Board Presentation University of North Carolina at Chapel Hill	05/18/2021 Chapel Hill, NC
<ul style="list-style-type: none">Presented an overview of laboratory research and efforts to the Biology Department’s advisory board, which helps fundraise and make strategic decisions for the department	
¹ Chair’s Advisory Committee University of North Carolina at Chapel Hill	03/10/2021 – 12/31/2022 Chapel Hill, NC
<ul style="list-style-type: none">Asked to serve on committee that advises the chair on departmental and strategic initiatives	
¹ Seminar Host University of North Carolina at Chapel Hill	09/23/2021 Chapel Hill, NC
<ul style="list-style-type: none">Invited Dr. Auke Ijspeert to speak about his work in biorobotics	
¹ Seminar Host University of North Carolina at Chapel Hill	11/17/2020 Chapel Hill, NC
<ul style="list-style-type: none">Invited and hosted Dr. Barbara Webb for the Distinguished Lecture Behavior & Biorobotics	
American Society of Mechanical Engineers (ASME) – Chair: Northwest Florida Section Northwest Florida Section	09/01/2016-7/01/2018 Niceville, FL
<ul style="list-style-type: none">Oversee and direct the activities for the section.Served as acting secretary and newsletter chair for 2014 and 2015.	
Seminar Organizer Air Force Research Laboratory – Munition’s Directorate	02/26/2018 Eglin AFB, FL
<ul style="list-style-type: none">Hosted Dr. Lorian Schweikert, a post-doctoral fellow at Duke University. Her seminar was titled “Cryptocurrency and Fish Skin: The Power of Distributed Sensing and Processing”.	
Nature-Inspired Navigation Session Co-Chair Institute of Navigation (ION) – Pacific Position, Navigation, and Time (PNT) Conference	09/01/2016-05/04/2017 Honolulu, Hawaii
<ul style="list-style-type: none">Soliciting and reviewing nature-inspired navigation papers to be programmed into the 2017 ION Pacific PNT conference.	
AFRL – Munitions Directorate Seminar Organizer Air Force Research Laboratory	12/1/2016-12/2/2016 Eglin Air Force Base, FL

! occurred during the COVID 19 pandemic, ^research leader, *lead author, &personnel supervised

- Initiated, coordinated and organized a visit for Dr. Jeremy Marvel (National Institute of Standards and Technology) at the Air Force Research Laboratory's Munition's Directorate. The visit was a joint visit for both AFRL, and the American Society of Mechanical Engineers (ASME).

Mechanical Engineering Departmental Seminar Organizer 02/18/2011
Case Western Reserve University Cleveland, OH

- Initiated, coordinated and organized a departmental seminar, facility tour, and proposal discussion for the Department of Mechanical and Aerospace Engineering at Case Western Reserve University. The guest was Dr. Bryan Jones (Mississippi State University).

Biomimetics Session Chair 10/15/2010
1st International Conference on Applied Bionics and Biomechanics Venice, Italy

- Led the session on biomimetics and ensured that the session ran smoothly amongst all of the presenters.

Member: President's Advisory Committee on Minorities (PACM) 11/01/2005 – 5/01/2010
Case Western Reserve University Cleveland, OH

- Committee aimed at moving Case Western Reserve University towards being a more diverse and inclusive environment that embraces and employs the benefits of diversity. This committee serves at the pleasure of the president. Served as the secretary for the last 2 years on the committee.

NSF ACES Distinguished Lecture Proposal Acceptance 02/01/2008
Case Western Reserve University Cleveland, OH

- Solely and successfully authored and had accepted a proposal to have Elena Messina of the Intelligent Systems Division at the National Institute of Standards and Technology (NIST) speak as an NSF Academic Careers in Engineering and Science (ACES) Advancement of Women in Academic Science and Engineering Careers (ADVANCE) seminar speaker at Case Western Reserve University. The talk took place on 2/12/2009.

Member: Dean Search Committee, Case School of Engineering 10/01/2006 – 12/22/2006
Case Western Reserve University Cleveland, OH

- One of 2 students on a committee formed to identify a candidate pool from which to select a dean for the Case School of Engineering at Case Western Reserve University.

Scholarly Reviews

- Living Machines Conference 04/22/2024
- Journal of Theoretical Biology 02/21/2024
- Journal of The Royal Society Interface 02/01/2024
- Transactions on Geoscience and Remote Sensing 05/12/2023
- Journal of Comparative Physiology A 03/04/2023
- ¹Journal of Comparative Physiology A 07/29/2021
- ¹IEEE Robotics and Automation Letters 01/12/2021
- ¹Journal of The Royal Society Interface 12/08/2020