

# MARIA HOLLAND

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## EDUCATION

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- Ph.D.**, Mechanical Engineering 2017  
Stanford University (Stanford, CA)  
Dissertation: “Computational Modeling of the Brain: Development, Health, and Disease”  
Advisor: Ellen Kuhl
- M.S.**, Mechanical Engineering 2013  
Stanford University (Stanford, CA)
- B.S.**, Mechanical Engineering 2011  
University of Tulsa (Tulsa, OK)  
Magna cum laude, Minors: Mathematics & Chinese
- Certificate**, Chinese Language & Culture 2010  
Xiamen University (Xiamen, Fujian Province, China)

## PROFESSIONAL APPOINTMENTS

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- University of Notre Dame (Notre Dame, IN)  
Clare Boothe Luce Assistant Professor, Department of Aerospace & Mechanical Engineering 2017–  
Assistant Professor, Bioengineering Graduate Program 2017–  
Member, Institute for Precision Health 2018–  
Member, Neuroscience & Behavior Program 2019–
- Stanford University (Stanford, CA)  
Visiting Assistant Professor, Department of Mechanical Engineering 2017

## JOURNAL PUBLICATIONS

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Key: corresponding\* ; trainees

- J15. Wang S, Saito K, Kawasaki H, and **Holland MA**\* (submitted). “Orchestrated neuronal migration and cortical folding: A computational and experimental study.”  
Code: [github/mholla/neuronal\\_migration](https://github.com/mholla/neuronal_migration)
- J14. Demirci N and **Holland MA**\* (2022). “Cortical thickness systematically varies with curvature and depth”. *Human Brain Mapping* 43:(6), 2064–2084. DOI: 10.1002/hbm.25776 Code: [github/mholla/HBM22](https://github.com/mholla/HBM22)
- J13. Darayi M, Hoffman ME, Sayut J, Wang S, Demirci N, Consolini J, and **Holland MA**\* (2021). “Computational Models of Cortical Folding: A Review of Common Approaches”. *Journal of Biomechanics*. DOI: 10.1016/j.jbiomech.2021.110851
- J12. Lee T, **Holland MA**, Weickenmeier J, Gosain AK, and Tepole AB\* (2021). “The Geometry of Incompatibility in Growing Soft Tissues: Theory and Numerical Characterization”. *Journal of the Mechanics and Physics of Solids* 146:104177. DOI: 10.1016/j.jmps.2020.104177

- J11. Wang S, Demirci N, and Holland MA\* (2021). “Numerical Investigation of Biomechanically Coupled Growth in Cortical Folding”. *Biomechanics and Modeling in Mechanobiology*. DOI: 10.1007/s10237-020-01400-w Code: [github/mholla/BMMB21](https://github.com/mholla/BMMB21)
- J10. Darayi M and Holland MA\* (2020). “Surface Pressure Reduces Stability in Bilayered Systems under Compression”. *International Journal of Non-Linear Mechanics* 127:103589. DOI: 10.1016/j.ijnonlinmec.2020.103589 Code: [github/mholla/NLM20](https://github.com/mholla/NLM20)
- J9. Holland MA, Budday S, Li G, Shen D, Goriely A\*, and Kuhl E (2020). “Folding Drives Cortical Thickness Variations”. *The European Physical Journal Special Topics* 229 (17-18):2757–2778. DOI: 10.1140/epjst/e2020-000001-6
- J8. Colin J, Darayi M, and Holland MA\* (2019). “Stiffness Contrast and Separation Influence Wrinkling of Adjacent Layers in a Homogeneous Matrix”. *Journal of Applied Mechanics* 86 (4):041004. DOI: 10.1115/1.4042430 Code: [github/mholla/JAM19](https://github.com/mholla/JAM19)
- J7. Colin J and Holland MA\* (2019). “Layer Wrinkling in an Inhomogeneous Matrix”. *International Journal of Solids and Structures* 156-157:119–125. DOI: 10.1016/j.ijsolstr.2018.08.004 Code: [github/mholla/IJSS19](https://github.com/mholla/IJSS19)
- J6. Holland MA, Budday S, Goriely A, and Kuhl E\* (2018). “Symmetry Breaking in Wrinkling Patterns: Gyri Are Universally Thicker than Sulci”. *Physical Review Letters* 121:228002. DOI: 10.1103/physrevlett.121.228002
- J5. Oomen PJA, Holland MA, Bouten CVC, Kuhl E, and Loerakker S\* (2018). “Growth and Remodeling Play Opposing Roles during Postnatal Human Heart Valve Development”. *Scientific Reports* 8 (1). DOI: 10.1038/s41598-018-19777-1
- J4. Holland MA, Li B, Feng XQ, and Kuhl E\* (2017). “Instabilities of Soft Films on Compliant Substrates”. *Journal of the Mechanics and Physics of Solids* 98:350–365. DOI: 10.1016/j.jmps.2016.09.012 Code: [github/mholla/JMPS17](https://github.com/mholla/JMPS17)
- J3. Holland MA, Miller KE, and Kuhl E\* (2015). “Emerging Brain Morphologies from Axonal Elongation”. *Annals of Biomedical Engineering* 43 (7):1640–1653. DOI: 10.1007/s10439-015-1312-9
- J2. Holland MA, Kosmata T, Goriely A, and Kuhl E\* (2013). “On the Mechanics of Thin Films and Growing Surfaces”. *Mathematics and Mechanics of Solids* 18 (6):561–575. DOI: 10.1177/1081286513485776
- J1. Zöllner AM, Holland MA, Honda KS, Gosain AK, and Kuhl E\* (2013). “Growth on Demand: Reviewing the Mechanobiology of Stretched Skin”. *Journal of the Mechanical Behavior of Biomedical Materials* 28:495–509. DOI: 10.1016/j.jmbbm.2013.03.018

## OTHER SCHOLARLY PRODUCTS

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- S3. “Curveball” (code repository). Code: [github/mholla/curveball](https://github.com/mholla/curveball)
- S2. “Hitchhiker’s Guide to Abaqus” (documentation). DOI: 10.5281/zenodo.1243270  
Files: [github/mholla/hitchhikers-guide-to-abaqus](https://github.com/mholla/hitchhikers-guide-to-abaqus)
- S1. “Growth” (code repository). DOI: 10.5281/zenodo.3862950 Code: [github/mholla/growth](https://github.com/mholla/growth)

## HONORS & AWARDS

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- National Science Foundation CAREER Award 2022
- Clare Boothe Luce Professorship, Henry Luce Foundation 2017–2022

- Diversifying Academia, Recruiting Excellence (DARE) Fellowship, Stanford University 2015–2017
- National Science Foundation Graduate Research Fellowship 2013
- Brit and Alex d'Arbeloff Graduate Fellowship, Stanford University 2011–2016
- Phi Beta Kappa 2011
- China Scholarship Council Scholarship, Chinese Ministry of Education 2009–2010
- Morris K. Udall Scholarship 2009–2010
- Barry M. Goldwater Scholarship 2008–2010

## GRANTS & FELLOWSHIPS

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### Active (External)

- NSF CMMI-2144412 CAREER Program 3/1/2022–2/28/2027  
 CAREER: Unfolding the cortex: Biomechanics-informed analysis of cortical thickness  
 (Holland, PI)
- I-CTSI Core Pilot 7/1/2019–6/30/2022  
 Mechanobiology of dura mater growth: an *in vivo* and *ex vivo* longitudinal study  
 (Holland, PI; Collaborators Ravosa & Goergen)
- NSF IIS-1850102 CISE Research Initiative 6/1/2019–5/31/2022  
 CRII: SCH: A computational toolbox for analysis of big brain data  
 + Research Experiences for Undergraduates Supplement  
 (Holland, PI)

### Active (Internal)

- Notre Dame International Asia Research Collaboration Grant 1/1/2022–12/30/2022  
*In vivo* calibration of an *in silico* model of brain development  
 (Holland, PI)
- Pontificia Universidad Católica de Chile Open Seed Fund 1/1/2021–6/30/2022  
 Mechanical correction of brain cortical thickness with deep learning  
 (Sahli Costabal, PI)

### Completed

- ND Advanced Diagnostics & Therapeutics Discovery Award 8/16/2018–8/15/2019  
 Cortical thickness variation as a biomarker for Autism Spectrum Disorders  
 (Holland, PI)

### Prior to Notre Dame

- NSF OISE-1515340 East Asia & Pacific Summer Institute 6/1/2015–5/31/2016  
 EAPSI: Investigation of the wrinkling and buckling behavior of layered  
 soft materials with applications in the developing brain  
 (Holland, PI)
- NSF DGE-1147470 Graduate Research Fellowship 9/1/2013–8/31/2017  
 Establishing, calibrating, and validating a mechanistic, patient-specific,

multiscale model for heart failure through sarcomerogenesis  
(Holland, Fellow)

## PRESENTATIONS

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### Keynotes and Invited Talks at Conference and Workshops

- K4. “Patterns of growth and thickness in the cerebral cortex,” American Physical Society, March Meeting. Chicago, IL, Mar 2022.
- K3. “Closer Look: Numerical Investigation of biomechanically coupled growth in cortical folding,” Closer Look Open Journal Club. Virtual, October 2021
- K2. “Mechanics-informed analysis of cortical thickness,” International Brain Mechanics and Trauma Lab International Workshop. Virtual, April 2021.
- K1. “The role of physical forces in the evolution of cortical morphogenesis,” American Physical Society, March Meeting. Denver, CO (meeting canceled; talk delivered at the Virtual March Meeting), Mar 2020.

### Invited Seminars

- I15. “Mechanics-informed analysis of cortical thickness” Pontificia Universidad Católica de Chile, Computational Medicine Group Santiago, Chile, May 2021.
- I14. “Emergent heterogeneity & other surprises in cortical folding” Purdue University, Weldon School of Biomedical Engineering. West Lafayette, IN, March 2021.
- I13. “Brain folding as a soft layered instability: Unique features and puzzles,” University of Florida, Department of Biomedical Engineering. Gainesville, FL, March 2021.
- I12. “Instabilities in soft materials: Emergent heterogeneity & other surprises,” University of Connecticut Dept. of Mechanical Engineering. Storrs, CT, Oct 2019.
- I11. “Mechanics of brain morphology: Cortical thickness variations,” Stanford University School of Engineering. Stanford, CA, Nov 2018.
- I10. “Mechanics of instabilities in the brain and other soft materials,” Indiana U. - Purdue U. Indianapolis Dept. of Mechanical & Energy Engineering. Indianapolis, IN, Sep 2018.
- I9. “Computational mechanics of morphology in the brain,” University of Xiamen School of Architectural & Civil Engineering. Xiamen, China, July 2018.
- I8. “Computational mechanics of morphology in the brain,” Tsinghua University Institute of Biomechanics and Medical Engineering. Beijing, China, July 2018.
- I7. “Computational modeling of the brain: Development, health, and disease,” University of Texas at El Paso Dept. of Mechanical Engineering. El Paso, TX, March 2017.
- I6. “Computational modeling of the brain: Development, health, and disease,” Catholic University of America Dept. of Mechanical Engineering. Washington, D.C., March 2017.
- I5. “Computational modeling of the brain: Development, health, and disease” University of Notre Dame Dept. of Aerospace & Mechanical Engineering. Notre Dame, IN, March 2017.
- I4. “Computational modeling of the brain: Development, health, and disease,” University of Tulsa Dept. of Mechanical Engineering. Tulsa, OK, March 2017.

13. “Computational modeling of the brain: Development, health, and disease,” Villanova University Dept. of Mechanical Engineering. Villanova, PA, February 2017.
12. “Computational modeling of the brain: Development, health, and disease,” University of Texas at Dallas Dept. of Mechanical Engineering. Richardson, TX, February 2017.
11. “Computational modeling of the brain: Development, health, and disease” University of North Texas Dept. of Mechanical & Energy Engineering. Denton, TX, January 2017.

### Conference Presentations (trainees)

- C36. Wang S, Saito K, Kawasaki H, & **Holland MA**. “Image-based calibration of a biomechanical model of neuronal migration and cortical folding,” *World Congress on Computational Mechanics*. Virtual, Aug 2022.
- C35. Demirci N & **Holland MA**. “Correlation between cortical morphology and thickness due to forces generated during folding,” *World Congress of Biomechanics*. Taipei, Taiwan, July 2022.
- C34. **Holland MA** & Darayi M. “Role of cerebrospinal, meningeal, and skull constraints on cortical folding,” *European Solid Mechanics Conference*. Galway, Ireland, July 2022.
- C33. Demirci N & **Holland MA**. “Cortical thickness correlates with cortical morphology among human and non-human primate brains,” *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Chesapeake Bay, MD, June 2022.
- C32. Wang S, Saito K, Kawasaki H, & **Holland MA**. “An integrated study of orchestrated neuronal migration and cortical folding,” *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Chesapeake Bay, MD, June 2022.
- C31. Jafarabadi F & **Holland MA**. “Computational modeling of brain bilayer under cerebrospinal fluid pressure,” *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Chesapeake Bay, MD, June 2022.
- C30. Wang X & **Holland MA**. “Computational modeling of connectivity-driven cortical scaling and folding,” *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Chesapeake Bay, MD, June 2022.
- C29. Sayut J & **Holland MA**. “Development of 3D brain structures from histology images,” (**BS Student Paper Competition finalist**), *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Chesapeake Bay, MD, June 2022.
- C28. Jafarabadi F & **Holland MA**. “Instability of bilayered systems under surface pressure: The effect of cerebrospinal fluid on cortical folding,” *American Physical Society March Meeting*. Chicago, IL, March 2022.
- C27. Consolini J & **Holland MA**. “Investigation of the Law of Volume Constancy in Cortical Laminae,” *American Physical Society March Meeting*. Chicago, IL, March 2022.
- C26. Wang S & **Holland MA**. “Multifield modeling of brain development,” *American Physical Society March Meeting*. Chicago, IL, March 2022.
- C25. Wang X & **Holland MA**. “Computational Modeling of White Matter with Axon Connectivity,” *American Physical Society March Meeting*. Chicago, IL, March 2022.
- C24. Demirci N & **Holland MA**. “Cortical thickness correlates with cortical morphology,” *Society for Neuroscience annual meeting*. Virtual, Nov 2021.

- C23. Wang S, Demirci N, Castro Solar V, Sahli Costabal F, **Holland MA**. “Unfolding the cortex via a physics-informed graph neural network,” *Ibero-Latin-American Congress on Computational Methods in Engineering and Pan American Congress on Computational Mechanics*. Virtual, Nov 2021.
- C22. Wang S, Demirci N, Castro Solar V, Sahli Costabal F, **Holland MA**. “Unfolding the cortex via a mechanics-informed graph neural network,” *International Symposium on Computer Methods in Biomechanics and Biomedical Engineering*. Virtual, Sep 2021.
- C21. Wang S, Demirci N, **Holland MA**. “Is heterogeneous cortical growth necessary to recapitulate cortical thickness patterns seen in the brain?” *U.S. National Congress of Computational Mechanics*. Virtual, July 2021.
- C20. Demirci N and **Holland MA**. “Cortical thickness distribution of the human cerebral cortex identified by curvature at local scales,” *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Virtual, June 2021.
- C19. Wang S, Demirci N, Castro Solar V, **Holland MA**, and Sahli Costabal F. “In vivo quantification of brain morphologies via mechanics-informed deep learning approach,” *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Virtual, June 2021.
- C18. Hoffman ME, Demirci N, and **Holland MA**. “The relation between cortical thickness and morphology: a study of nonhuman primate brains,” *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Virtual, June 2021. **BS Student Paper Competition Finalist**
- C17. Wang S and **Holland MA**. “Coupled bio-mechanical growth in cerebral gyrification,” *World Congress of Computational Mechanics*. Paris, France, July 2020 (meeting canceled).
- C16. Darayi M and **Holland MA**. “Buckling under pressure: Does the cerebrospinal fluid affect the wrinkling instabilities in the brain?” *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Virtual, June 2020.
- C15. Demirci N and **Holland MA**. “Quantitative investigation of the folding patterns of the human cerebral cortex,” *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Virtual, June 2020.
- C14. Wang S and **Holland MA**. “Numerical investigation of biomechanically-coupled growth in brain gyrification,” *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Virtual, June 2020.
- C13. Hoffman ME, Sayut JP, and **Holland MA**. “Analyzing the cortical thickness of mammalian species through the segmentation of magnetic resonance imaging scans,” *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Virtual, June 2020.
- C12. Demirci N, Wang S, and **Holland MA**. “Mechanics-informed big data analysis of cortical thickness,” *Sixth Annual Brain Initiative Investigators Meeting*. Washington, D.C., Jan 2020.
- C11. **Holland MA**, Kuhl E, and Goriely A. “Passive physical forces in gyrification lead to characteristic cortical thickness variations,” *Society for Neuroscience Annual Meeting*. Chicago, IL, Oct 2019.
- C10. **Holland MA**. “Kinematic measures influence cortical thickness,” *Biomedical Engineering Society Annual Meeting*. Philadelphia, PA, Oct 2019.
- C9. **Holland MA**, Darayi M, Hoffman ME, Twohy K, Hardan AY, Goriely A, and Kuhl E. “Image-based analysis of cortical thickness patterns,” *U.S. National Congress of Computational Mechanics*. Austin, TX, July 2019.

- C8. Darayi M, Colin, J, and **Holland MA**. “Linear stability analysis of bilayer wrinkling in an infinite-sized homogeneous matrix,” *U.S. National Congress of Computational Mechanics*. Austin, TX, July 2019.
- C7. **Holland MA**, Kuhl E, and Goriely A. “Cortical thickness differences emerge from passive physical forces generated by growth,” *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Seven Springs, PA, June 2019.
- C6. **Holland MA**, Goriely A, and Kuhl E. “Physiological and pathological cortical thickness variations,” *World Congress of Computational Mechanics*. New York, NY, July 2018.
- C5. **Holland MA**, Hardan AY, Goriely A, and Kuhl E. “Thickness variations resulting from symmetry breaking in soft matter instabilities,” *U.S. National Congress for Theoretical and Applied Mechanics*. Chicago, IL, June 2018.
- C4. **Holland MA**, Li B, Feng XQ, and Kuhl E. “Instabilities in growing or compressed bilayered systems with low stiffness contrast,” *World Congress of Computational Mechanics*. Seoul, South Korea, July 2016.
- C3. Vijayakumar N, **Holland MA**, and Kuhl E. “A mechanical model for cortical folding during brain development,” *Summer Biomechanics, Bioengineering and Biotransport Conference*. Snowbird, UT, June 2015.
- C2. **Holland MA** and Kuhl E. “The effect of white matter anisotropy on cortical folding during development,” *World Congress of Computational Mechanics*. Barcelona, Spain, July 2014.
- C1. **Holland MA**, Steinmann P, and Kuhl E. “Theory and numerics of volume and surface growth in the developing brain,” *U.S. National Congress of Computational Mechanics*. Raleigh, NC, July 2013.

### Internal Presentations

- “Local shape analysis of curvature and thickness in the cerebral cortex,” University of Notre Dame Department of Applied & Computational Mathematics & Statistics. Notre Dame, IN, Apr 2022.
- “Biomechanics: A new tool for understanding brain development,” St. Mary’s College Master of Autism Studies Program. Notre Dame, IN, Mar 2019.
- “Neuromechanics across the scales,” University of Notre Dame Department of Biological Sciences. Notre Dame, IN, Jan 2019.

## TEACHING

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### Instructor of Record

Notre Dame AME 60624: Continuum Mechanics

- Fall 2021: 10 students
- Spring 2020: 10 students (switched to virtual halfway through)

Notre Dame AME 40572/50572/60572: Introduction to Biomechanics (new course developed)

- Spring 2022: 24 students
- Spring 2021: 44 students (virtual)
- Fall 2019: 37 students

- Spring 2019: 40 students
- Spring 2018: 34 students

### Guest Lectures

- Master of Autism Studies Program, St. Mary's University 2019

### Course Assistant

- Stanford Graduate Summer Institute: Jumpstart Your Academic Job Search 2016–2017
- Stanford ME 337: Mechanics of Growth 2013

### Pedagogical Training

- A Practical Guide to Teaching and Learning in STEM conference (Notre Dame) 2018
- Stanford EDUC 297: Teaching and Learning in Higher Education 2016
- Stanford ENGR 312: Science and Engineering Course Design 2015

## RESEARCH ADVISING

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### Postdoctoral Scholars

- Shuolun Wang (NJIT Ph.D. '18) 2019–  
Publications: J11, J13, J15. Presentations: C12, C14, C17, C19, C21, C22, C23, C26, C32

### Graduate Students

- Xincheng Wang (Notre Dame AME Ph.D. program) 2021–  
Presentations: C25, C30
- Fatemeh Jafarabadi (Notre Dame AME Ph.D. program, post-quals) 2021–  
Presentations: C28, C31
- Jack Consolini (Notre Dame AME Ph.D. program, post-quals) 2020–  
Publications: J13. Presentations: C27
- Nagehan Demirci (Notre Dame BIOE Ph.D. program, post-quals) 2019–  
Publications: J11, J13, J14. Presentations: C12, C15, C18, C19, C20, C21, C22, C23, C24, C35, C33
- Mohsen Darayi (Notre Dame AME Ph.D. program, post-candidacy) 2018–  
Publications: J8, J10, J13. Presentations: C8, C9, C16, C34

### Graduate Alumni:

- Katie Lindsley (Notre Dame M.S.M.E) 2020–2021  
Thesis: *Instabilities in concave surfaces*  
Placement: Development Engineer at Zimmer



## Undergraduate Students

- Renee Maslak (Notre Dame B.S. Physics in Medicine '24) 2022–
- Olivia Kalla (Notre Dame B.S.M.E. '24) 2021–
- John Sayut (Notre Dame B.S.M.E. '22) 2019–  
Publications: J13. Presentations: C13, C29  
Awards: Sorin Scholar (2019), Naughton Fellow (2020, canceled), SB3C BS Student Paper Competition finalist (2022), **NSF Graduate Research Fellowship (2022)**  
Placement: Ph.D. program at U. Michigan

## Undergraduate Alumni:

- Mia Hoffman (Notre Dame B.S.M.E. '21, **undergraduate thesis**) 2018–2021  
Publications: J13. Presentations: C9, C13, C18  
Awards: **NSF Graduate Research Fellowship (2021)**  
Placement: Ph.D. program at U. Washington
- Kyra Twohy (Notre Dame B.S.M.E. '18) 2018  
Presentations: C9  
Placement: Ph.D. program at U. Delaware
- Nithya Vijayakumar (Stanford B.S.M.E. '15) 2014  
Presentations: C3  
Placement: M.D. program at U. Michigan
- Nick Forsch (Wash U. B.S.M.E. '14) 2013  
Placement: Ph.D program at U.C. San Diego

## Supervisory Committees

- Daniel Solomons (PUC Chile, Biological & Medical Engineering, Ph.D) candidacy exam 2022
- Gozde Basara (ND AME Ph.D.) candidacy exam 2021
- Yunyang Gu (ND AME M.S.) thesis defense 2021
- Erin Archibeck (ND AME B.S.) DaVinci program 2020
- Adam Hellinghausen (ND AME B.S.) DaVinci program 2020
- Marzieh Mirhoseini (ND AME Ph.D.) qualifying and candidacy 2019–2021
- Megan Levis (ND BioE Ph.D.) candidacy and defense 2019–2021

## SERVICE

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### Professional Service

- Member, New PI Slack Membership Advisory Board 2022–
- Organizer, Future Faculty Poster Session 2022  
*Summer Bioengineering, Biomechanics, and Biotransport Conference, Maryland*
- Guest Editor, “Brain Morphology and Morphogenesis” special issue 2022  
*Brain Multiphysics*
- Co-chair, “Cardiovascular growth and remodeling mechanics” Minisymposium 2022  
*World Congress of Biomechanics, Taipei, Taiwan*

- Guest Editor, “Image-Based Methods in Computational Medicine” special issue 2021  
*Engineering with Computers*
- Fellow, NSF CMMI Game Changer Academy for Advancing Research Innovation 2021
- Organizer, “Machine Learning for Biological Modelling and Simulation” Minisymposium 2021  
*Pan American Congress on Computational Mechanics*, Rio de Janeiro, Brazil
- Organizer, “Imaging-based methods in computational medicine” Minisymposium 2021  
*International Symposium on Computer Methods in Biomechanics and Biomedical Engineering*, Bonn, Germany
- Organizer, “Growth and remodeling of living tissues” Minisymposium 2021  
*U.S. National Congress on Computational Mechanics*, Chicago, IL
- Organizer, “Imaging-based methods in computational medicine ” Minisymposium 2021  
*U.S. National Congress on Computational Mechanics*, Chicago, IL
- Organizer, “Mechanics of brain development” Minisymposium 2020  
*World Congress on Computational Mechanics*, Paris, France (meeting canceled)
- Organizer, “Imaging-based modeling in biomechanics” Minisymposium 2019  
*U.S. National Congress on Computational Mechanics*, Austin, TX
- Panelist, National Science Foundation (Division of Civil, Mechanical & Manufacturing Innovation, Collaborative Research in Computational Neuroscience)
- Reviewer, *Nature Communications*, *Journal of the Mechanics and Physics of Solids*, *Journal of Biomechanics*, *Journal of the Mechanical Behavior of Biomedical Materials*, *Mathematics and Mechanics of Solids*, *Cerebral Cortex*, *Brain Multiphysics*, *International Journal of Non-Linear Mechanics*, *Advanced Biosystems* (for complete list, see Publons)

### University & Department Service

- AME Diversity & Inclusion Coordinator 2019–2021
- AME faculty search committee, member 2019-2020
- Notre Dame Introduction to Engineering Summer Program, speaker 2018  
Lectured on “Introduction to [Brain] Biomechanics”.
- Notre Dame College of Engineering Future Faculty Workshop, moderator 2018  
Participated in panel on “Preparing a Research and Teaching Statement”.
- Stanford University Career Education, instructor 2016–2017  
Presented workshop on “Writing an Effective Diversity Statement”.
- Stanford University Committee for Graduate Studies, student member 2014–2017  
Reviewed, formulated, and approved policies governing graduate education.
- Stanford University Office of Community Standards, judicial panelist 2015–2016  
Adjudicated cases involving violations of academic integrity.

### Mentoring

- Building Bridges, mentor 2019–  
Mentored first-year underrepresented student to adjust to college and explore majors.

- Advancing Women Leaders, mentor 2018–2020  
Met regularly with mentee to discuss personal & professional development.
- Society of Women Engineers and El Centro Chicano y Latino, mentor 2012–2015  
Met regularly one-on-one with three undergraduates to facilitate the transition to college and advise on majors, courses, activities, time management, etc.

### **Outreach**

- ScienceWorld, interviewee 2020  
Described the science of yo-yo-ing for a student-oriented science magazine.
- Biomechanics in the Wild student blog, podcast, and Youtube channel, creator 2019–  
Started student-written blog to introduce interesting biomechanics topics to the general public.
- American Society of Mechanical Engineers, “Pizza and Professors” speaker 2019  
Spoke to undergraduate students about my research.
- High School outreach, speaker 2018  
Spoke to classes at Coon Rapids and Blaine High Schools in Minnesota.

### **MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS**

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- American Physical Society, member 2020–
- Sigma Xi, The Scientific Research Honor Society, member 2019–
- Biomedical Engineering Society (BMES), member 2019–2020
- Society for Neuroscience (SfN), member 2019–
- Society of Women Engineers (SWE), member 2019–
- American Society of Mechanical Engineers (ASME), member 2018–
- International Association for Computational Mechanics (IACM), member 2018–
- US Association for Computational Mechanics (USACM), member 2018–
- American Society for Engineering Education (ASEE), member 2018–