

MARIA HOLLAND

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Aerospace & Mechanical Engineering
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EDUCATION

- Ph.D.**, Mechanical Engineering 2017
Stanford University (Stanford, CA)
Advisor: Ellen Kuhl
Dissertation: “Computational Modeling of the Brain: Development, Health, and Disease”
- 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

- University of Notre Dame (Notre Dame, IN)**
- Clare Boothe Luce Assistant Professor 2017 – present
Department of Aerospace & Mechanical Engineering
- Instructor 2017
Department of Aerospace & Mechanical Engineering
- Stanford University (Stanford, CA)**
- Visiting Assistant Professor 2017
Department of Mechanical Engineering

PUBLICATIONS

Peer-Reviewed Publications

- [1] **Holland, M. A.**; Budday, S.; Li, G; Shen, D. G.; Goriely, A.; & Kuhl, E. “Symmetry breaking in the developing brain: Cortical thickness variations emerge from folding.” *Submitted*
- [2] Colin, J.; **Holland, M. A.**; & Kuhl, E. “Layer wrinkling in an inhomogeneous matrix.” *Submitted*
- [3] Oomen, P. J. A.; **Holland, M. A.**; Bouten, C. V. C.; Kuhl, E.; & Loerakker, S. “Growth and remodeling play opposing roles during postnatal human heart valve development.” *Scientific Reports* (2018) doi:10.1038/s41598-018-19777-1
- [4] **Holland, M. A.**; Li, B.; Feng, X. Q.; & Kuhl, E. “Instabilities of soft films on compliant substrates.” *Journal of the Mechanics and Physics of Solids* (2017) doi:10.1016/j.jmps.2016.09.012
- [5] **Holland, M. A.**; Miller, K. E.; & Kuhl, E. “Emerging Brain Morphologies from Axonal Elongation.” *Annals of Biomedical Engineering* (2015) 43: 1640. doi:10.1007/s10439-015-1312-9

- [6] **Holland, M. A.**; Kosmata, T.; Goriely, A.; Kuhl, E. “On the mechanics of thin films and growing surfaces.” *Mathematics and Mechanics of Solids* (2013) 18(6): 561-575. doi:10.1177/1081286513485776
- [7] Zöllner, A. M.; **Holland, M. A.**; Honda, K. S.; Gosain, A. K.; Kuhl, E. “Growth on demand: Reviewing the mechanobiology of stretched skin.” *Journal of the Mechanical Behavior of Biomedical Materials* (2013) 28: 495-509. doi:10.1016/j.jmbbm.2013.03.018

Conference Publications

- [1] French, J.J.; Clancy, C. T.; Johnston, A. L.; **Holland, M. A.**; Henshaw, J. M. “Design and Fabrication of the Sustainable Shepherds Residence,” Proceedings of Energy Sustainability 2009 (ES2009), San Francisco, California. July 2009. ES2009-90074

Other Publications

- [1] **Holland, M. A.** “The Hitchhiker’s Guide to Abaqus.” (2017) doi:10.5281/zenodo.1243270

FELLOWSHIPS, AWARDS, & HONORS

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| o Henry Luce Foundation, Clare Boothe Luce Professorship | 2017 |
| o Stanford University, Diversifying Academia, Recruiting Excellence (DARE) Fellowship | 2015 |
| o National Science Foundation, East Asia & Pacific Summer Institute (EAPSI) Fellowship | 2015 |
| o National Science Foundation, Graduate Research Fellowship (GRFP) | 2013 |
| o Stanford University, Brit and Alex d’Arbeloff Graduate Fellowship | 2011 |
| o Phi Beta Kappa | 2011 |
| o Chinese Ministry of Education, China Scholarship Council Scholarship | 2009 |
| o Barry M. Goldwater Scholarship | 2009 |

PRESENTATIONS

Invited Talks

- [1] University of Texas at El Paso, Mechanical Engineering, 24 March 2017
- [2] Catholic University of America, Mechanical Engineering, 13 March 2017
- [3] University of Notre Dame, Aerospace and Mechanical Engineering, 7 March 2017
- [4] University of Tulsa, Mechanical Engineering, 3 March 2017
- [5] Villanova University, Mechanical Engineering, 17 February 2017
- [6] University of Texas at Dallas, Mechanical Engineering, 2 February 2017
- [7] University of North Texas, Mechanical and Energy Engineering, 31 January 2017

Conference Talks

- [1] **Holland, M. A.**; Goriely, A.; Kuhl, E. “Thickness variations resulting from symmetry breaking in soft matter instabilities,” World Congress of Computational Mechanics. New York, NY, July 2018.
- [2] **Holland, M. A.**; Hardan, A.; Goriely, A.; Kuhl, E. “Physiological and pathological cortical thickness variations,” U.S. National Congress for Theoretical and Applied Mechanics Chicago, IL, June 2018.

- [3] **Holland, M. A.**; Li, B.; Feng, X. Q.; Kuhl, E. “Instabilities in Growing or Compressed Bilayered Systems With Low Stiffness Contrast,” World Congress of Computational Mechanics. Seoul, South Korea, July 2016.
- [4] **Holland, M. A.** “The Effect of White Matter Anisotropy on Cortical Folding During Development,” Stanford/Berkeley Compfest. Stanford, CA, December 2014.
- [5] **Holland, M. A.**; Kuhl, E. “The Effect of White Matter Anisotropy on Cortical Folding During Development,” World Congress of Computational Mechanics. Barcelona, Spain, July 2014.
- [6] **Holland, M. A.**; Steinmann, P.; Kuhl, E. “Theory and Numerics of Volume and Surface Growth in the Developing Brain,” U.S. Congress of Computational Mechanics. Raleigh, NC, July 2013.
- [7] **Holland, M. A.**; French, J.; Henshaw, J. “Biogas Digestion in Rural China: Design, Construction, and Use,” 12th Annual Student Research Colloquium and 84th Annual AAAS-SWARM Meeting. University of Tulsa, Tulsa, OK, March 2009.
- [8] **Holland, M. A.**; Hesse, T. “Sustainable Energy for North East Asia (SENEA),” 8th Annual Oklahoma Sustainability Network State-Wide Conference: Foreign Exchange Program session. University of Central Oklahoma, Edmond, OK, March 2009.
- [9] **Holland, M. A.** “Sustainable Energy for North East Asia (SENEA),” Best Presentation at the University of Tulsa Community Service Symposium: Citizenship and Service in a Changing World, The University of Tulsa, Tulsa, OK, April 2008.

TEACHING

Instructor of Record

Notre Dame AME 50572: Introduction to Biomechanics
 Spring 2018: 34 students 2018

Course Assistant

Stanford Graduate Summer Institute: Jumpstart Your Academic Job Search
 Instructor 2017
 Course Assistant 2016

Stanford ME 337: Mechanics of Growth
 Course Assistant 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

Graduate Students

- Mohsen Darayi (Notre Dame AME Ph.D. program) 2018 – present

Undergraduate Students

- Kyra Twohy (Notre Dame B.S.M.E., expected ‘18) 2018
- Nithya Vijayakumar (Stanford B.S.M.E., ‘15, now at U. Michigan Medical School) 2014
- Nick Forsch (Wash U. B.S.M.E., ‘14, now Ph.D candidate at UC San Diego) 2013

SERVICE

Professional Service

- Reviewer, *International Journal of Non-Linear Mechanics*
- Reviewer, *Journal of the Mechanics and Physics of Solids*

University Service

- 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 Graduate Life Office, Community Associate 2013–2017
Supported graduate students with educational, social and wellness resources.
- 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.
- Stanford University Mechanical Engineering Visit Day, Student Coordinator 2013–2016

Outreach & Mentoring

- Women Leaders in STEM Program, Mentor 2018 – present
Met regularly with mentee to discuss personal & professional development.
- National Biomechanics Day, Host 2017
Introduced high school students to biomechanics research on the brain.
- Project Motivation, Volunteer 2015–2016
Spoke to groups from underrepresented backgrounds about experiences at college to broaden their knowledge and expectations of higher education.
- Brain Day, Volunteer 2015–2016
Led interactive classes for middle school students about the form and function of the brain, using hands-on activities, including preserved human and animal brains.
- 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.