Rebecca Fenton Friesen

Department of Mechanical Engineering, Northwestern University
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Research Interests

- Friction modulation and its use in rendering surface haptic effects
- The biomechanical properties of the fingertip and their effect on tactile perception
- Texture discrimination and parameterization on surface haptic devices

Education

2019 (expected) P.h.D. Mechanical Engineering, Northwestern University, Evanston IL
2016 M.S. Mechanical Engineering, Northwestern University, Evanston IL
2009 B.A. Physics, *summa cum laude*, Goshen College, Goshen Indiana

Research and Professional Experience

2013-present **Mechanical Engineering Department, Northwestern University**
Masters Student 2013-2014, Graduate Research Assistant 2014-present, Neuroscience and Robotics Laboratory
Studying surface haptic technology with a focus on characterizing ultrasonic friction reduction and rendering texture via friction modulation

2009-2013 **Feinberg School of Medicine, Northwestern University**
Lab Technician, The Miller Laboratory of Limb Motor Control
Assisted with equipment maintenance, animal training, and data analysis in a neural engineering lab developing brain-machine interface technology

2006-2009 **Goshen College**
Undergraduate Research Assistant, Biophysics Research Group
Studied the patterned distribution of sterol molecules within cellular membranes and their role in ion channel formation

Honors and Awards

2017 Martin Outstanding Doctoral Fellowship
2015 Best Student Presentation, World Haptics Conference
2005 National Merit Scholarship

Teaching Experience

Northwestern University

2018 *Co-Instructor: Introduction to Dynamic Systems*
2017 *Guest Lecturer: Experimental Engineering*
Taught a class period on the principles of Psychophysics
2017 *Teaching Assistant: Experimental Engineering*
Supervised lab hours, graded lab reports and homework assignments

2014-2015	*Teaching Assistant: Introduction to Dynamic Systems*
	Held weekly office hours, assisted flipped classroom activities, graded exams
	Goshen College
2008	*Teaching Assistant: German II*
	Led weekly discussion groups, administered quizzes
2006-2008	*Lab Assistant: Physical World (Introduction to Physics for non-majors)*
	Supervised weekly lab sessions, assisted with equipment, graded lab notebooks
2006-2008	*Academic Tutor*
	Met with students on a weekly basis for tutoring in essay writing and physics

Leadership and Professional Service

	Northwestern University
2018	Workshop leader for Northwestern's New TA Conference
2017-present	Peer reviewer for World Haptics Conference technical papers
2015	Member of Local Arrangements Committee for World Haptics Conference
2014-2017	Neuroscience and Robotics Lab Tour Coordinator
	Goshen College
2009	Member of Search Committee for new Physics Professor

Invited Talks

2014	Featured Speaker, Women in Science Workshop, Goshen College

Peer-Reviewed Manuscripts

Friesen, R.F., Klatzky, R.L., Peshkin, M.A. and Colgate, J.E. (2018, March). Single Pitch Perception of Multi-frequency Textures. Haptics Symposium (HAPTICS), 2018 IEEE. (pp. 290–295).

Friesen, R. F., Wiertlewski, M., Peshkin, M. A., & Colgate, J. E. (2017, June). The Contribution of Air to Ultrasonic Friction Reduction. In World Haptics Conference (WHC), 2017 IEEE. (pp. 517-522).

Friesen, R. F., Wiertlewski, M., & Colgate, J. E. (2016, April). The role of damping in ultrasonic friction reduction. In Haptics Symposium (HAPTICS), 2016 IEEE (pp. 167-172).

Wiertlewski, M., Friesen, R. F., & Colgate, J. E. (2016). Partial squeeze film levitation modulates fingertip friction. Proceedings of the National Academy of Sciences, 113(33), 9210-9215.

Friesen, R. F., Wiertlewski, M., Peshkin, M. A., & Colgate, J. E. (2015, June). Bioinspired artificial fingertips that exhibit friction reduction when subjected to transverse ultrasonic vibrations. In World Haptics Conference (WHC), 2015 IEEE (pp. 208-213).

Weber, D. J., Friesen, R., & Miller, L. E. (2012). Interfacing the somatosensory system to restore touch and proprioception: essential considerations. Journal of Motor Behavior, 44(6), 403-418.

Meeting Abstracts, Posters, and Demonstrations

Friesen, R. F., R.L. Klatzky, M.A. Peshkin and J. E. Colgate, "Two Frequencies, One Pitch: Exploring Pitch Perception When Scanning Multi-frequency Textures", *Hand, Brain and Technology Conference*, 2018.

Friesen, R. F., R.L. Klatzky, M.A. Peshkin and J. E. Colgate, "Single Pitch Perception of Multi-frequency Textures", *Proceedings of Haptics Symposium,* IEEE, 2018.

Friesen, R. F., M. Wiertlewski, M.A. Peshkin and J. E. Colgate, "Stroboscopic investigation of ultrasonic friction reduction on a vibrating plate", *Proceedings of the World Haptics Conference (WHC),* IEEE, 2015.

Oby E.R., R. Friesen, and L.E. Miller. "Muscle-like neurons for a muscle-like BMI: No evidence for extrinsic neurons in M1," *Society for Neuroscience annual meeting*, San Diego, CA, 2010.

Friesen, R., C. Helrich, E. Sucipto, and K. Steiner. "Monte Carlo Simulations of Sterol Superlattice Mosaics in Bilayers Yield Simultaneous Agreement with Concentration and Chemical Potential Data," *Biophysical Society annual meeting*, Boston, MA, 2009.

Friesen, R., C. Helrich, E. Sucipto, K. Steiner, and D. Woodbury, "Experimental and Monte Carlo Investigations of Nystatin Channel Current Decay and Sterol Mosaics in Mixed Lipid/Ergosterol Domains at Moderate Ergosterol Mol Fraction," *Biophysical Society annual meeting*, Long Beach, CA, 2008.

Friesen, R. "Monte Carlo Investigations of Sterol Microstructure Mosaics in Mixed Lipid/Ergosterol Domains at Moderate Ergosterol Mol Fraction," *Proceedings of The National Conference On Undergraduate Research (NCUR)*, Salisbury, MD, 2008.