

Courtney A. (Clum) Peckens

Curriculum Vitae

Engineering Department
Hope College
VanderWerf 223E
27 Graves Place
Holland, MI 49423

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EDUCATION

University of Michigan, College of Engineering, Ann Arbor, MI

- Ph.D. Civil and Environmental Engineering, May 2014
Advisor: Jerome P. Lynch, Ph.D.
Thesis: Bio-Inspired Compressive Sensing based on Auditory Neural Circuits for Real-time Monitoring and Control of Civil Structures using Resource Constrained Sensor Networks
- M.S.E. Electrical Engineering, December 2011
Area of Study: Signal Processing
- M.S.E Civil and Environmental Engineering, April 2008
Area of Study: Structural Engineering
- Certificate in Engineering Education Research, May 2014

Hope College, Holland, MI

- B.S. Engineering with Mechanical Emphasis, May 2006
- B.A. French, May 2006

PROFESSIONAL EXPERIENCE

Associate Professor, Engineering Department 2013 - present
Hope College, Holland, MI

Staff Engineer II 2008-2009
Ruby + Associates, Farmington Hills, MI

- Analyzed and retrofitted complex structural connections in existing buildings
- Designed new structural connections for existing buildings undergoing retrofit work

Structural Engineer Intern 2007-2008
SmithGroup, Detroit, MI

- Conducted seismic and wind analysis for lateral drift analysis of buildings
- Performed design analysis using RAM Steel and RISA
- Drafted structural details using AutoDesk CAD
- Created vibration analysis spreadsheet for steel beams in floor systems

GRANTS

National Science Foundation

RUI: Bio-Inspired Architectures Enabling Real-Time Feedback Control in Wireless Sensing and Actuating Networks
Civil, Mechanical, and Manufacturing Innovation (CMMI) Division
August 2017 – July 2020, \$133,889

GRANTS AND CONTRACTS (CONT.)

Hope College

Field deployment of wireless sensors for noise monitoring purposes
Nyenhuis Faculty Development Grant
April 2017 – September 2017, \$7,200.00

Noise monitoring using wireless sensor nodes
Nyenhuis Faculty Development Grant
April 2016 – September 2016, \$6,500.00

Invited participant in Continuum Scholars program (summer workshop focused on vocation and research) through this award

Development of wireless sensor node for structural monitoring and damage detection in civil infrastructure
Howard Hughes Medical Institute, Faculty Research Award
January 2015- December 2015, \$14,734.00

PUBLICATIONS

Book Chapters

M.B. Kane, C. Peckens, “Digital control” in *Mark’s Standard Handbook for Mechanical Engineers* (ed. A. M. Sadegh, W. M. Worek), 12th ed., McGraw Hill Education, 2018.

C. Peckens, M.B. Kane, Y. Zhang, J.P. Lynch, “Introduction to wireless structural monitoring systems: permanent installation in infrastructure systems,” in *Sensor Technologies for Civil Infrastructures* (ed. M. Wang, J.P. Lynch and H. Sohn), Woodhead Publishing, London, 2014.

M.B. Kane, C. Peckens, J.P. Lynch, “Introduction to wireless structural monitoring systems: design and selection,” in *Sensor Technologies for Civil Infrastructures* (ed. M. Wang, J.P. Lynch and H. Sohn), Woodhead Publishing, London, 2014.

Journal Papers

C. Peckens, I. Cook, C. Fogg, “Bio-inspired architecture for real-time feedback control in wireless sensing and actuating networks”, *Bioinspiration and Biomimetics*, 2019, 14(3).

C. Peckens, C. Porter, T. Rink, "Wireless Sensor Networks for Long-Term Monitoring of Urban Noise", *Sensors*, 2018, 18(9), <https://doi.org/10.3390/s18093161>.

C. Peckens, J.P. Lynch, G. Heo, “Resource efficient wireless sensor network architecture based on bio-mimicry of the mammalian auditory system,” *Journal of Intelligent Material Systems and Structures*, 2015, 26(1), pp 79-100.

C. Peckens, J.P. Lynch, “Utilizing the cochlea as a bio-inspired compressive sensing technique,” *Smart Materials and Structures*, 2013, 20 (105027).

R. L. Veldman, J. Ari-Gur, C. Clum, "Response of Pre-Pressurized Reinforced Plates Under Blast Loading", *International Journal of Impact Engineering*, April 2008, 35(4), pp. 240-250.

R. L. Veldman, J. Ari-Gur, C. Clum, A. DeYoung, J. Folkert, “Effects of Pre-pressurization on Blast Response of Clamped Aluminum Plates”, *International Journal of Impact Engineering*, Oct. 2006, 32(10), pp. 1678-1695.

PUBLICATIONS (CONT.)

Conference Proceedings

C. Peckens, C. Fogg, "Bio-inspired iterative learning techniques for control of civil infrastructure" in *SPIE: Smart Structures and Non-Destructive Evaluation and Health Monitoring*, Denver, CO, March 4-7, 2019.

C. Peckens, I. Cook, J.P. Lynch, "Communication analysis for feedback control of civil infrastructure using cochlea-inspired sensor nodes" in *SPIE: Smart Structures and Non-Destructive Evaluation and Health Monitoring*, Las Vegas, NV, March 20-23, 2016.

C. Peckens, J.P. Lynch, "Wireless feedback control using a cochlea inspired compressive sensing approach," *Proceedings of the 6th Edition of the World Conference of the International Association for Structural Control and Monitoring*, Barcelona, Spain, July 15-17, 2014.

C. Peckens, J.P. Lynch, "Embedded linear classifiers for damage detection in civil infrastructure," *Proceedings of SPIE Conference on Smart Structures and Materials and Non-Destructive Evaluation and Health Monitoring*, San Diego, CA, March 10-14, 2013.

C. Peckens, J.P. Lynch, "Cochlea-inspired sensing node for structural control applications," *Proceedings of SPIE Conference on Smart Structures and Materials and Non-Destructive Evaluation and Health Monitoring*, San Diego, CA, March 10-14, 2013.

C. Peckens, J.P. Lynch, "Cochlea-based signal decomposition and compression for structural monitoring applications," *Proceedings of 2012 Joint Conference of the Engineering Mechanics Institute and 11th ASCE Joint Specialty Conference on Probabilistic Mechanics and Structural Reliability*, Notre Dame University, South Bend, IN, June 17-20, 2012.

C. Peckens, J.P. Lynch, "Cochlea-based spectral decomposition for signals in resource constrained sensor networks," *Proceedings of 8th Annual International Workshop on Structural Health Monitoring*, Stanford University, Palo Alto, CA, September 13-15, 2011.

C. Peckens, J.P. Lynch, J.-S. Pei, "Distributed neural computations for embedded sensor networks," *Proceedings of SPIE Conference on Smart Structures and Materials and Non-Destructive Evaluation and Health Monitoring*, San Diego, CA, March 6-10, 2011.

Conference/Poster Presentations

C. Peckens, "Bio-inspired control of civil infrastructure using real-time frequency decomposition," Engineering Mechanics Institute Conference 2017, San Diego, California, June 2017.

C. Peckens, J.P. Lynch, "Cochlea-inspired sensors for real-time structural control applications," Engineering Mechanics Institute Conference 2013, Evanston, Illinois, August, 2013.

C. Peckens, J.P. Lynch, "Cochlea-based spectral decomposition for resource constrained sensor networks", US-Japan Workshop on Bio-Inspired Sensing and Bio-Inspired Actuation, Berkeley, California, poster presentation, November, 2011.

C. Peckens, J.P. Lynch, J.-S. Pei, "Distributed neural computations for embedded sensor networks", 1st Sino-America Workshop on Advanced Sensors and Bio-Inspired Technologies, Shanghai, China, poster presentation, November, 2010.

C. Peckens, J.P. Lynch, and J.-S. Pei, "Volterra/Weiner neural networks on embedded microprocessors", Engineering Mechanics Institute 2010, Emerging Sensors and Structural Health Monitoring, Los Angeles, California, August, 2010.

PUBLICATIONS – ENGINEERING EDUCATION

Conference Proceedings

C. Peckens, J.P. Lynch, “Deepening math and science skills in middle-school students using engineering-based learning modules,” *Proceedings of American Society of Engineering Education Conference*, San Antonio, TX, June 10-13, 2012.

Conference/Poster Presentations

M. Randolph, K. Slay, C. Peckens, “The Sense of Community is Really What Kept Me in It: The Role of Self-Organized Community in Promoting Persistence of Underrepresented Minority Students in Undergraduate Education,” Association for the Study of Higher Education Annual Conference, St. Louis, Missouri, paper presentation, November, 2013.

M. Randolph, K. Slay, C. Peckens, “Factors Promoting Persistence: A Qualitative Study of the Academic, Social, and Institutional Experiences of African American Students in Engineering,” American Educational Research Association Annual Conference, San Francisco, California, round-table discussion, May, 2013.

C. Peckens, J.P. Lynch, "Embedding math concepts into a civil engineering outreach program for middle-school students," Center for Research on Learning and Teaching in Engineering 7th Annual Research and Scholarship in Engineering Education Poster Fair, Ann Arbor, Michigan, poster presentation, March, 2013.

C. Peckens, M. Randolph, K.E. Slay, "Factors Promoting Persistence of African American Students in Undergraduate Engineering" Center for Research on Learning and Teaching in Engineering 7th Annual Research and Scholarship in Engineering Education Poster Fair, Ann Arbor, Michigan, poster presentation, March, 2013.

INVITED SEMINARS

“Structural Control of Civil Infrastructure: Bio-Inspired Approach,” Calvin College, Engineering Seminar, May 2017

“Structural Control of Civil Infrastructure: Bio-Inspired Approach,” Hope College, Winter Happenings, January 2017

“An Integrated Way of Life”, Hope College, Continuum Scholars, January 2017

TEACHING EXPERIENCE

Hope College, Holland MI

Course	Semester Taught: Enrollments			
ENGS 140: <i>Introduction to Electric Circuits Laboratory</i>	SP14: 7, 18, 14	SP15: 19, 15		
ENGS 222: <i>Mechanics of Materials</i>	SP19: 18, 28			
ENGS 240: <i>Electric Circuits Laboratory</i>	FA13: 13, 19, 11, 10			
ENGS 295: <i>Introduction to Engineering Computing</i>	FA17: 22, 24	SP18: 21		
ENGS 332: <i>Control Systems</i>	SP16: 21, 9	SP17: 16, 10	SP18: 24	
ENGS 333: <i>System Dynamics Laboratory</i>	FA14: 15, 15	FA15: 15, 16	FA16: 13, 16	
	FA17: 15	FA18: 15		
ENGS 355: <i>Structural Analysis</i>	FA13: 26	FA15: 28	FA17: 23	
ENGS 360: <i>Geotechnical Engineering</i>	SP15: 7	SP17: 10	SP19: 5	
ENGS 364: <i>Steel Design</i>	FA14: 10	FA16: 7	FA18: 7	
ENGS 365: <i>Concrete Design</i>	SP14: 5	SP16: 7	SP18: 8	

K-12 Outreach Programs

University of Michigan, Ann Arbor, MI

Instructor for Detroit Area Pre-College Engineering Program (DAPCEP)	2011-2013
Instructor for Michigan Introduction to Technology and Engineering (MITE)	2011, 2012
Instructor for Summer College Engineering Exposure Program (SCEEP)	2012

Instructor Mentoring Programs
University of Michigan, Ann Arbor, MI

Engineering Teaching Consultant 2012-2013
- Formally trained in constructive peer mentoring for the application of enhancing the overall teaching experience for graduate teaching assistants, and correspondingly the learning experience of their students
- Conducted observations and midterm student feedback for graduate teaching assistants

HONORS & AWARDS

Richard F. & Eleanor A. Towner Prize for Distinguished Academic Achievement, University of Michigan 2013
Presented to the outstanding graduate student in the Civil and Environmental Engineering department for outstanding participation in research, leadership and academic performance

Scholarship for 1st International Summer School on Smart Structures, University of Trento, Italy 2012
Selected to attend 1st International Summer School on Smart Structures based on potential for successful learning and studying of workshop topics in an international setting

Anna Olcott Smith Award, University of Michigan 2012
Awarded to a graduate student who has demonstrated exceptional scholarly achievement, a sense of social responsibility and interest in the success of women in the academic community

U.S. Student Delegate for US-Japan Workshop on Bio-Inspired Sensing & Actuation 2011
Selected as a student delegate for international collaboration on bio-inspired sensing and actuation research topics

U.S. Student Delegate for 1st Sino-American Workshop on Adv. Sensors & Bio-Inspired Technologies 2010
Selected as a student delegate for international collaboration on bio-inspired sensing and actuation research topics

Southland Medal, Hope College 2006
Awarded to the most outstanding woman of her graduating class

Clare Booth Luce Scholar, Hope College 2004
Selected as recipient of full scholarship and summer research experience for two years, based on academic record and interest in the physical sciences

HOPE COLLEGE SERVICE

Co-Chair, Hope College Engineering Faculty Search Committee 2017-2018
Member, Hope College Provost Search Committee 2016-2017
Member, Cultural Affairs Committee 2014-present
Advisor, Hope College Engineers Without Borders Student Chapter 2014-present

MEMBERSHIPS & AFFILIATIONS

Engineer in Training, State of Michigan
American Society of Civil Engineers (ASCE), member
American Society of Engineering Education (ASEE), member
Institute of Electrical and Electronics Engineers (IEEE), member