

CONNOR H. LIGEIKIS

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EDUCATION

University of Michigan

Ph.D. in Civil Engineering
Concentration: Intelligent Systems
Advisor: Prof. Jeff Scruggs
NSF Graduate Research Fellow

Ann Arbor, MI
September 2019 – May 2023 (Anticipated)

University of Michigan

M.S. in Electrical & Computer Engineering, GPA: 3.947/4.0
Concentration: Control Systems

Ann Arbor, MI
September 2019 – May 2021

University of Connecticut

M.S. in Civil Engineering, GPA: 4.164/4.0
Concentration: Structural Engineering
Advisor: Prof. Richard Christenson
US Dept. of Education GAANN Fellow

Storrs, CT
August 2017 – May 2019

University of Connecticut

B.S.E in Civil Engineering, GPA: 3.986/4.0
Summa Cum Laude | Honors Scholar | Minor in Computer Science

Storrs, CT
August 2013 – May 2017

PROFESSIONAL EXPERIENCE

Graduate Research Assistant, University of Michigan

August 2019 – Present

Project: *Self-Powered Feedback Control Systems*
Supervisor: Prof. Jeff Scruggs

Graduate R&D Intern, Sandia National Laboratories

June 2019 – August 2019

Project: *Modeling and Experimental Validation of a Pylon with Multiple Nonlinearities*
Supervisor: Dr. Robert Kuether

Visiting Researcher, Institute of Structural Engineering, ETH Zurich

March, August, December 2018

Project: *Hybrid Simulation of Plate Buckling with Uncertain Boundary Conditions*
Supervisors: Prof. Bozidar Stojadinovic, Prof. Giuseppe Abbiati

Graduate Research Assistant, University of Connecticut

June 2017 – May 2019

Project: *Exploring Uncertainty in Real-Time Hybrid Substructuring of Marine Systems*
Supervisor: Prof. Richard Christenson

Undergraduate Research Assistant, University of Connecticut

Spring 2017

Project: *Experimental Study on the Effect of Biopolymer Application on Sand Cohesion*
Supervisors: Prof. Amvrossios Bagtzoglou, Prof. Amine Dahmani

Transportation Construction Inspector, NYS Dept. of Transportation

Summers 2014, 2015, 2016

JOURNAL ARTICLES

Published:

1. Abbiati, G., Marelli, S., **Ligeikis, C.**, Christenson, R., & Stojadinovic, B. (2022). Training of a classifier for structural component failure based on hybrid simulation and kriging. *Journal of Engineering Mechanics*, 148(1), 04021137.
2. **Ligeikis, C.**, & Christenson, R. (2020). Identifying stochastic frequency response functions using real-time hybrid substructuring, principal component analysis, and kriging metamodeling. *Experimental Techniques*, 44(6), 763-786. [Special Issue on New Frontiers and Innovative Methods for Hybrid Simulation]
3. **Ligeikis, C.**, & Christenson, R. (2020). Assessing structural reliability using real-time hybrid substructuring. *International Journal of Lifecycle Performance Engineering*, 4(1-3), 158-183. [Special Issue on Hybrid Simulation for Multi-Hazard Engineering]

In Review:

1. **Ligeikis, C.**, & Scruggs, J. On the feasibility of self-powered linear feedback control. [Submitted to *IEEE Transactions on Automatic Control*, preprint available]

In Preparation:

1. **Ligeikis, C.**, & Scruggs, J. Multi-objective vector control of a three-phase vibratory energy harvester. [To be submitted to *IEEE Transactions on Control Systems Technology*]
2. **Ligeikis, C.**, & Scruggs, J. Causal, constrained model predictive control of wave-energy converters in stochastic waves. [To be submitted to *IEEE Transactions on Sustainable Energy*]
3. **Ligeikis, C.**, & Scruggs, J. Synthesis of linear and nonlinear self-powered feedback control laws. [To be submitted to *IEEE Transactions on Control Systems Technology*]
4. **Ligeikis, C.**, & Scruggs, J. Performance-guaranteed control with actuator power directionality constraints. [To be submitted to *IEEE Transactions on Control Systems Technology*]

PEER-REVIEWED CONFERENCE PAPERS

1. Scruggs, J. & **Ligeikis, C.** (in review). Necessary conditions for feasibility of linear, time-invariant self-powered feedback control laws. *2023 American Control Conference*, San Diego, CA, USA, May 31 - June 2.
2. **Ligeikis, C.**, & Scruggs, J. (2022, accepted). An LQG-inspired framework for self-powered feedback control. *2022 IEEE Conference on Decision and Control*, Cancun, Mexico, December 6-9.
3. **Ligeikis, C.**, & Scruggs, J. (2022). Discrete-time, performance-guaranteed control of vibratory systems with power directionality constraints. *2022 American Control Conference*, Atlanta, GA, USA, June 8-10.
4. **Ligeikis, C.**, & Scruggs, J. (2021). Feasibility and synthesis of finite-dimensional, linear time-invariant synthetic admittances for self-powered systems. *2021 IEEE Conference on Decision and Control*, Austin, TX, USA, December 13-15.
5. **Ligeikis, C.**, & Scruggs, J. (2021). Nonlinear feedback controllers for self-powered systems with non-ideal energy storage subsystems. *2021 American Control Conference*, New Orleans, LA, USA, May 26-28.

OTHER CONFERENCE PROCEEDINGS & PRESENTATIONS

1. **Ligeikis, C., & Scruggs, J.** (2022). Self-powered synthetic admittances for linear feedback control. *9th IFAC Symposium on Mechatronic Systems*, Los Angeles, CA, USA, September 7-9. [Abstract]
2. **Ligeikis, C., & Scruggs, J.** (2022). Causal, constrained model predictive control of wave energy converters in stochastic waves. *16th International Conference on Motion and Vibration Control*, Los Angeles, CA, USA, September 7-9. [Abstract]
3. **Ligeikis, C., Bouma, A., Shim, J., Manzato, S., Kuether, R., & Roettgen, D.** (2020). Modeling and experimental validation of a pylon subassembly mockup with multiple nonlinearities. *38th International Modal Analysis Conference*, Houston, TX, USA, February 10-13. [Full paper]
4. Abbiati, G., Marelli, S., **Ligeikis, C.**, Christenson, R., Sudret, B. & Stojadinovic, B. (2019). Active learning of the buckling domain of an elastically restrained beam based on hybrid simulation and kriging surrogate modeling. *HYSIM19 – Joint ETH-MECHS Workshop: New Frontiers and Innovative Methods for Hybrid Simulation*. Zurich, Switzerland, March 13-15. [Abstract]
5. **Ligeikis, C.** & Christenson, R. (2019). Incorporating uncertainty in the physical substructure during hybrid substructuring. *37th International Modal Analysis Conference*, Orlando, FL, USA, January 28-31. [Extended abstract]
6. **Ligeikis, C., Freeman, A., & Christenson, R.** (2018). Assessing structural reliability at the component test stage using real-time hybrid substructuring. *36th International Modal Analysis Conference*, Orlando, FL, USA, February 12-15. [Extended abstract]
7. Dahmani, A., Dahan, F., Qweider, F., **Ligeikis, C.**, Mulqueen, J., Bagtzoglou, C., Albino, R., Beach, R., Damon, S., & Anzinger, E. (2018). Sand cap stabilization and sediment resuspension mitigation optimization using innovative protein polysaccharide biopolymers (PPBs). *Western Dredging Association Dredging Summit & Expo '18*, Norfolk, VA, USA, June 25-28. [Full paper]
8. Dahmani, A., Dahan, F., **Ligeikis, C.**, Qweider, F., Mulqueen, J., Albino, R., Beach, R., & Damon, S. (2018). Sand cap stabilization, sediment resuspension mitigation and GAC/PAC amendment transport optimization using innovative protein polysaccharide biopolymers (PPBs). *11th International Conference on Remediation of Chlorinated and Recalcitrant Compounds*, Palm Springs, CA, USA, April 8-12. [Poster]

TECHNICAL REPORTS

1. Christenson, R. & **Ligeikis, C.** (2018). National Institute for Undersea Vehicle Technology (NIUVT) Test Report 08-2018-01 submitted to General Dynamics Electric Boat, 16 pages.
2. Christenson, R. & **Ligeikis, C.** (2018). National Institute for Undersea Vehicle Technology (NIUVT) Test Report 08-2018-02 submitted to General Dynamics Electric Boat, 17 pages.
3. Christenson, R. & **Ligeikis, C.** (2018). National Institute for Undersea Vehicle Technology (NIUVT) Test Report 08-2018-03 submitted to General Dynamics Electric Boat, 35 pages.

THESES

1. **Ligeikis, C.** (in progress). Self-powered systems for structural control: theory and experiment. Ph.D. Thesis. University of Michigan.
2. **Ligeikis, C.** (2019). Exploring uncertainty in real-time hybrid substructuring. Master's Thesis. University of Connecticut.
3. **Ligeikis, C.** (2017). Effect of surface modifying biopolymers on sand cohesion. Undergraduate Honors Thesis. University of Connecticut.

SELECTED AWARDS/HONORS

Cyber-Physical Systems Rising Star 2022 , University of Virginia	May 2022
Graduate Research Fellowship , National Science Foundation	2019 – 2023
GAANN Fellowship , U.S. Dept. of Education	2017 – 2019
Honors Scholar , University of Connecticut	May 2017
The Moles Scholarship , The Moles Organization, New York City, NY	Fall 2016
Transportation Undergraduate Research Fellowship , University of Connecticut	Summer 2016
Lawrence S. St. John Scholarship , UConn School of Engineering	Fall 2016
Jack E. Stephens Scholarship , UConn School of Engineering	Fall 2015
Pratt & Whitney Leadership, Teaching, & Mentoring Fellowship , UConn School of Engineering	Fall 2014
Academic Excellence Scholarship , University of Connecticut	2013 – 2017
Babbidge Scholar , University of Connecticut	2014, 2016
New England Scholar , University of Connecticut	2015

TEACHING EXPERIENCE

U-M Graduate Teacher Certificate , Center for Research on Learning & Teaching, University of Michigan	In-progress
Graduate Student Instructor , University of Michigan	
<i>CEE 375 Sensors, Circuits, and Signals</i>	Winter 2022
- Facilitated lab sessions, graded lab submissions, held office hours	
<i>CEE 373 Statistical Methods for Data Analysis and Uncertainty Modeling</i>	Fall 2022
- Prepared exams/HW assignments, guest lectured, supervised undergraduate graders, graded exams, held office hours	
Guest Lecturer , University of Connecticut	Fall 2018
<i>CE 2110 Applied Mechanics I (Statics)</i>	
Senior Design Project Advisor , University of Connecticut	August 2017 – May 2018
<i>CE 4900W Civil Engineering Projects</i>	
- Guided a group of four senior civil engineering students as they completed their senior design project over the course of two semesters	
Undergraduate Teaching Assistant , University of Connecticut	
<i>ENVE 3120 Fluid Mechanics</i>	Spring 2016, Fall 2016
- Graded HW assignments, held office hours	
<i>CE 2110 Applied Mechanics I (Statics)</i>	Fall 2014, Fall 2015
- Graded HW assignments, held office hours	

MENTORING & OUTREACH

- Instructor**, Discover Engineering, University of Michigan July 28-29, 2022
- Facilitated hands-on workshops that introduced middle school students to the disciplines of civil and environmental engineering
- Graduate Advisor**, Concrete Canoe Association, University of Connecticut Fall 2017 – Spring 2019
- Invited Speaker**, University of Connecticut Naval Science & Technology Program Fall 2018
ENGR 3109 Undergraduate Navy STEM Professional Seminar
- Tutor**, Windham Heights After School Program, Willimantic, CT Fall 2014 – Spring 2016
- Helped elementary and middle school students with their math, science, and reading homework

LEADERSHIP & SERVICE

- CEE Faculty Search Committee Graduate Student Representative**, University of Michigan Fall 2021 – Spring 2022
- Reviewed applications, interviewed candidates, participated in committee meetings
- CEE Graduate Student Advisory Council Member**, University of Michigan Fall 2020 – Fall 2022
- GSAC serves as an advisory body to the CEE Dept. Chair and Associate Dept. Chair of Graduate Programs
 - Responsible for developing and facilitating social/professional events for CEE graduate students
- Manuscript Reviewer** Present
- *Joint 9th IFAC Symposium on Mechatronic Systems and 16th International Conference on Motion and Vibration Control*
 - *American Control Conference*
 - *Experimental Techniques* (A journal of the Society for Experimental Mechanics)

PROFESSIONAL CERTIFICATIONS

- Engineer-in-Training** State of Connecticut
EIT.0011805 Issued: July 7, 2017

WORKSHOPS ATTENDED

- Cyber-Physical Systems (CPS) Rising Stars Workshop 2022**, University of Virginia, Charlottesville, VA, May 26, 2022.
- PREEMPTIVE (Pacific Rim Earthquake Engineering Mitigation Protective Technologies International Virtual Environment) Advanced Studies Institute**, University of Costa Rica, San Jose, Costa Rica, February 7-13, 2019.
- Substructuring in Engineering Dynamics: Emerging Numerical and Experimental Techniques – Short Course**, International Center for Mechanical Sciences, Udine, Italy, July 23-27, 2018.