BIANCA CHAMPENOIS

Cambridge, MA

bchamp@mit.edu ◇ linkedin.com/in/biancachampenois ◇ biancach.github.io

EDUCATION

PhD, Mechanical Engineering and Computation, Massachusetts Institute of Technology 2022 - 2025
Minor: Geophysical Fluid Dynamics

Master of Science, Mechanical Engineering, Massachusetts Institute of Technology 4.9/5.0 2020 - 2022
Thesis: Reconstructing 3D ocean temperature fields from real-time satellite and buoy surface measurements.

Bachelor of Science, Mechanical Engineering, University of California, Berkeley 3.9/4.0 2016 - 2020

RESEARCH EXPERIENCE

SAND Lab (Stochastic Analysis and Nonlinear Dynamics) - MIT September 2020 - PRESENT
- Developing frameworks that leverage machine learning techniques to build real time models of nonlinear ocean and atmospheric systems using a combination of data from physics-based numerical simulations and measurements from real-world sensors.

DAAD RISE - Technische Universität Hamburg, Germany May 2019 - August 2019
- Wrote control and reinforcement learning algorithms to maximize the power output from an Acrobot pendulum that is vertically excited by ocean waves. Used LabVIEW and Raspberry Pi to collect data on the performance of the pendulum.

Envtl. Fluid Mechanics and Hydrology Lab - UC Berkeley January 2019 - May 2021
- Set up instruments and experiments to study the effect of surface flow on methane emissions from wetlands. Used Raspberry Pi to collect data on the relationship between the flow velocity and the rate of diffusion of gases. Experimented with two-camera system for 3D imaging.

Cal Energy Corps - Tecnológico de Monterrey, Mexico May 2018 - August 2018
- Designed PCBs for power converters for renewable energy integration. Selected and assembled passive and active components for circuits. Tested the converter and gathered data on its performance at high voltages and currents. Used LabVIEW to simulate the converter and design controllers to adjust the duty cycle of the circuit.

PUBLICATIONS

B. Champenois, T. Sapsis. Machine learning framework for the real-time reconstruction of regional 4D ocean temperature fields from historical reanalysis data and real-time satellite and buoy surface measurements. Physica D: Nonlinear Phenomena, December 2023.

CONFERENCES

B. Champenois, A. Charalampopoulos, T. Sapsis, Quantifying the value of data in scientific machine learning models with output-weighted active learning. AGU, Fall 2023.

S. Guth, B. Champenois, T. Sapsis, Application of Gaussian process multi-fidelity optimal sampling to ship structural modeling. 34th Symposium on Naval Hydrodynamics, June 2022.

B. Champenois, T. Sapsis, A multi-fidelity framework for ocean temperature reconstruction based on model-inferred dynamics and real time satellite and buoy measurements. AGU, Fall 2021.

K.T. Huynh, E. Variano, B. Champenois, M. Grehm, Correlating gas exchange across the air-water interface to water-side velocity statistics. AGU, Fall 2020.

AWARDS AND RECOGNITIONS

Society of Industrial and Applied Math (SIAM) Uncertainty Quantification (UQ) Travel Award	2024
Clement F. Burnap for Outstanding Master of Science in a Marine Field	2023
Meredith Kamm Award for Excellence in a Woman Graduate Student	2023
3^{rd} Place in the De Florez Competition in the Category of Graduate Science	2023
National Science Foundation Graduate Research Fellowship	2020

SKILLS

Programming	Python, MATLAB, NumPy, Pandas, TensorFlow, ROS, Java
Design	Adobe, AutoCAD, SolidWorks, Fusion, KiCad
Technical	3D printing, laser cutter, machine shop trained
Language	French (fluent), Spanish (proficient)

WORK EXPERIENCE

Communication Lab Fellow June 2023 - PRESENT
MIT School of Engineering Cambridge, MA
- Communication coach for graduate and undergraduate students. Responsibilities include one-on-one sessions, content creation for the online CommKit resource, and technical communication workshops.

Teaching Assistant for 2.122: Stochastic Systems January 2022 - May 2022
MIT Department of Mechanical Engineering Cambridge, MA
- In charge of writing and grading problem sets and exams, and holding weekly office hours and review sessions for a class of 38 graduate students.

Graduate Resident Advisor September 2021 - PRESENT
MIT Division of Student Life Cambridge, MA
- Live-in resident advisor at Next House in charge of supporting 45 undergraduate students and fostering a safe and positive living environment. Responsible for setting community expectations, organizing social activities, managing crises, and providing mental health support.

Mechanical Engineering Intern May 2020 - July 2020
Hello Robot Martinez, CA
- Manufactured parts, configured electronics, and assembled robots. Improved the design of the product. Optimized, streamlined, and documented the fabrication process.

EXTRACURRICULAR ACTIVITIES

The Bike Lab President June 2022 - PRESENT
- Started a brand new student-run bike shop at MIT. In charge of fundraising, purchasing tools and parts, recruiting volunteers, coordinating hours, and leading repairs.

ENGAGE Peer Mentor September 2022 - PRESENT
MIT Department of Mechanical Engineering
- Mentor for incoming women and underrepresented minority first year graduate students. Weekly group discussions and regular one-on-one meetings.

Quals and Lunch Seminar Chair January 2021 - January 2023
Graduate Association of Mechanical Engineers (GAME)
- Responsible for providing graduate students with the resources they need to prepare for the qualifying exams. Hosted faculty panel to answer questions from students. Coordinated office hours. Organized a semesterly seminar series for graduate students to share their research with the broader community and practice their presentation skills. Streamlined the feedback process for attendees to provide advice to speakers. Hosted 15 speakers each semester with 20 attendees at each talk.