BIANCA CHAMPENOIS

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EDUCATION

Massachusetts Institute of Technology *2022 -*
PhD Mechanical Engineering

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

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

RESEARCH EXPERIENCE

Stochastic Analysis and Nonlinear Dynamics (SAND) Lab - MIT August 2020 -

· Developing frameworks that leverage machine learning techniques to build real time models of non-linear geophysical systems using a combination of data from physics-based numerical simulations and measurements from 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.

PREPRINTS

B. Champenois, T. Sapsis. Real-time reconstruction of 3D ocean temperature fields from reanalysis data and satellite and buoy surface measurements. Submitted to Physica D: Nonlinear Phenomena, 2022. https://doi.org/10.1002/essoar.10511749.1

CONFERENCES

American Geophysical Union Fall Meeting Fall 2021

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

American Geophysical Union Fall Meeting Fall 2020

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

AWARDS AND RECOGNITIONS

National Science Foundation Graduate Research Fellowship (2020)
Harrington Fellowship (2020)

SKILLS

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

WORK EXPERIENCE

MIT Department of Mechanical Engineering January 2022 - May 2022
Teaching Assistant for 2.122: Stochastic Systems

· In charge of writing and grading problem sets and exams, and holding weekly office hours and review sessions for a class of 38 students.

MIT Division of Student Life August 2021 -
Graduate Resident Advisor

· 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.

Hello Robot May 2020 - July 2020
Mechanical Engineering Intern *Martinez, CA*

· Manufactured parts, configured electronics, and assembled robots. Improved the design of the product. Optimized, streamlined, and documented the fabrication process.

VOLUNTEERING ACTIVITIES

Graduate Association of Mechanical Engineers (GAME) January 2021 -
Quals and Lunch Seminar Chair *MIT*

· 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.

The Bike Lab June 2022 -
President *MIT*

· Starting a brand new student-run bike shop at MIT. In charge of fundraising, purchasing tools and parts, recruiting volunteers, coordinating hours, and leading repairs.

BicyCAL September 2017 - May 2020
Head Mechanic *UC Berkeley*

· In charge of running and maintaining a student-run bike shop, leading repairs and teaching customers how to fix their own bikes. Held weekly workshops specifically for women to create an inclusive environment. Organized and taught a semester long class with lectures, worksheets, and assignments on bike repair and maintenance. Mentored students at Richmond High School through the process of building and designing an electric bike for a competition.