

# Emma R. Ozanich

emmareevesozanich@gmail.com :: 218-839-5123 :: emma-ozanich.github.io

## Education

---

*Ph.D. Oceanography – Scripps Institution of Oceanography, La Jolla, California.* December 2020

Thesis: Machine learning in passive ocean acoustics for localizing and characterizing events.

*M.S. Oceanography – Scripps Institution of Oceanography, La Jolla, California. GPA: 3.59* October 2017

*B.S. Physics – Hamline University, St. Paul, Minnesota. GPA: 3.67* June 2014

## Experience

---

**JASCO Applied Sciences – Project Scientist.**, Remote (Arvada, CO) 03/2022 - Present

*40 hrs/week*

- Compute and analyze acoustic data using High-Performance Computing (HPC) with batch scripting, and custom-built analysis software in IDL and R
- Discuss and present technical results to nontechnical clients using Powerpoint tables and graphics
- Develop dashboard summary with Python Holoviz and Matplotlib for visual comparative assessments
- Write pipeline in Python and R to parse Excel tables and text to long-format data tables for analysis
- Conduct and improve nonlinear/linear regression and statistical field data analysis in R

**Woods Hole Oceanographic Institution – Postdoc. Investigator**, Woods Hole, MA. 2021 - 2022

*40 hrs/week*

- Investigated impacts of Gulf stream temperature variations on ocean acoustic travel paths using signal processing analysis of 2021 experimental data
- Ran GPU-accelerated mathematical models to predict temperature effects

**University of California San Diego – Graduate Researcher**, San Diego, CA 2014 - 2020

*20 hrs/week*

- Wrote an unsupervised image-based clustering pipeline to group coral reef sounds using deep clustering and Gaussian mixture models in Python Scikit-Learn (SKLearn)
- Developed a deep neural network in Python Keras to predict realtime location of multiple sources
- Implemented statistical signal processing analyses of underwater acoustic data using MATLAB
- Conduct matrix computation and neural network training on local GPU clusters

*Graduate Teaching Assistant – ECE 228: Machine learning for physical applications* 2019, 2020

*10 hrs/week*

- Designed demo for importing, analyzing, and visualizing NOAA datasets with Google BigQuery, Jupyter, and Pandas

## Software experience

---

MATLAB, Python and Jupyter, IDL, LaTeX, Vault, Sourcetree (Git), Microsoft Office, linux/unix, R Studio, ArcGIS Arcmap, Github, SQLite, C++

## Certificates and Training

---

Learn SQL Basics for Data Science. *Coursera (UC Davis). 20 hrs/4 weeks* Fall 2022

Micro-MBA *UCSD Rady School of Business. 70 hrs/7 weeks* Summer 2020

HPC User Training *San Diego Supercomputer Center. 80 hrs/8 weeks* Spring 2020

OceanHackWeek *University of Washington - Seattle. 40 hrs/1 week* Summer 2018

## Mentorship

---

Research Mentor, *Halıcıoğlu Data Science Institute*. 120 hrs/12 weeks

Spring 2018

- Guided 5 undergraduate and graduate students on an introductory machine learning research project
- Students presented posters at the Faculty Open House for Halıcıoğlu Data Science Institute

## Select Publications

---

- E. Ozanich, G. Gawarkiewicz, Y. T. Lin, “Study of acoustic propagation across an oceanic front at the edge of the New England Shelf,” *J. Acoust. Soc. Am.* **152** (2022): 3756–3767.
- E. Ozanich, A. Thode, P. Gerstoft, L. A. Freeman, and S. Freeman, “Deep embedded clustering of coral reef bioacoustics,” *J. Acoust. Soc. Am.* **149** (2021): 2587–2601.
- E. Ozanich, P. Gerstoft, and H. Niu, “A feedforward neural network for direction-of-arrival estimation,” *J. Acoust. Soc. Am.* **147** (2020): 2035–2048.
- M. J. Bianco, P. Gerstoft, J. Traer, E. Ozanich, M. Roch, S. Gannot, and C.-A. Deledalle, “Machine learning in acoustics: Theory and applications,” *J. Acoust. Soc. Am.* **146** (2019): 3590–3628.
- H. Niu, E. Ozanich, and P. Gerstoft, “Ship localization in Santa Barbara Channel using machine learning classifiers,” *J. Acoust. Soc. Am.* **142** (2017): EL455–460.

## Select Conference Presentations

---

- Ozanich, DeCourcy, Lin, (2022) “Modeling and observation of low-frequency propagation into warm core ring on the New England shelf slope,” *Acoust. Soc. Am. 181st Meeting*, Seattle, WA, Dec. 2022.
- Ozanich, et al. (2020) “Unsupervised clustering of coral reef fish calls,” *Acoust. Soc. Am. 179th Meeting*, Virtual meeting.
- Ozanich, Gerstoft, Niu (2019) “A deep network for single-snapshot direction of arrival estimation,” *IEEE Mach. Learn. Sig. Proc.*, Pittsburgh, PA, Oct. 2019.
- Ozanich, Gerstoft, Niu, (2019) “Direction-of-arrival estimation using supervised machine learning,” *IEEE Underwater Acoust. Sig. Proc.*, Whispering Pines Conf. Ctr., RI, Oct. 2019.
- Ozanich, et al. (2018) “Ocean acoustic range estimation in noisy environments using convolutional networks,” *Acoust. Soc. Am. 176th Meeting*, Victoria, B.C., Nov. 2018 (**2<sup>nd</sup> Student Paper, Acoustical Oceanography**).
- Reeves, Gerstoft, Worcester, and Dzieciuch, (2016) “Detecting ice noise in Arctic ambient noise recorded on a drifting vertical line array,” *Acoust. Soc. Am. 171st Meeting*, Salt Lake City, UT, May 2016.
- Reeves, et al. (2013) “Using CReSIS airborne RADAR to constrain ice-volume influx across the lateral shear margins of the Northeast Greenland Ice Sheet,” *AGU Fall Meeting 2013*, San Francisco, CA, Dec. 2013.