ERIC ORENSTEIN, PH.D.

PROFESSIONAL PREPARATION

Colorado College	Physics	B.A.,	2011
University of California, San Diego	Applied Ocean Sciences	Ph.D.,	2018
University of California, San Diego	Biological Oceanography	Postdoc,	2018–20
Sorbonne Université	Data science/oceanography	Postdoc,	2020-21
Monterey Bay Aquarium Research Institute	Bioinspiration Lab	Postdoc,	2021-23

REFEREED PUBLICATIONS

Walker, J. and E.C. Orenstein. 2021. Improving rare-class recognition of marine plankton with hard negative mining. *IEEE/CVF International Conference on Computer Vision Workshops (ICCVW)*.

Ronen, R., Y. Attias, Y.Y. Schechner, J.S. Jaffe, and E.C. Orenstein. 2021. Plankton reconstruction through robust statistical optical tomography. *Journal of the Optical Society of America A* 38(9): 1320-1331. (**Editors' Pick**)

Orenstein, E.C., D. Ratelle, C. Briseño-Avena, M. Carter, P.J.S. Franks, J.S. Jaffe, and P.L.D. Roberts. 2020. The Scripps Plankton Camera system: a framework and platform for in situ microscopy. *Limnology and Oceanography: Methods 8*(11), 681-695.

Orenstein, E.C., K.M. Kentiz, P.L.D. Roberts, P.J.S. Franks, J.S. Jaffe, and A. D. Barton. 2020. Semi- and fully supervised quantification techniques to improve population estimates from machine classifiers. *Limnology and Oceanography: Methods* 18(12), 739-753.

Kenitz, K.M., E.C Orenstein, P.L.D. Roberts, P.J.S. Franks, J.S. Jaffe, M.L. Carter, and A. D. Barton. 2020. Controls of population variability in colony-forming marine diatoms. *Limnology and Oceanography* 65(10): 2515-2528.

Orenstein, E.C. and O. Beijbom. 2017. Transfer learning and deep feature extraction for planktonic image data sets. *IEEE Winter Conference on Applications of Computer Vision (WACV)* 1082-1088.

Orenstein, E.C., J.M. Haag, Y.L. Gagnon, and J.S. Jaffe. 2016. Automated Recognition of Camouflaging Cuttlefish. *Methods in Oceanography*, 15: 21-34.

Bagulayan, A., J.N. Bartlett-Roa, A.L. Carter, B.G. Inman, E.M. Keen, E.C. Orenstein, N.V. Patin, K.N.S. Sato, E.C. Sibert, A.E. Simonis, A.M. Van Cise, and P.J.S. Franks. 2012. Journey to the center of the gyre: The fate of the Tohoku Tsunami debris field. *Oceanography* 25(2): 200-207.

PUBLICATIONS IN PREPARATION

Orenstein, E.C., S.D Ayata, F. Maps, J.O. Irisson, et al. (In review) Characterizing functional traits of planktonic organisms from images. *Limnology and Oceanography.*

Orenstein, E.C., E. Saberski, C. Briseño-Avena. (In review) Discovery and dynamics of a cryptic marine copepod-parasite interaction. *Marine Ecology Progress Series*.

Scoulding, B. and E.C. Orenstein (In prep) Automated detection of orange roughy under variable conditions. *ICES Journal of Marine Science.*

CONFERENCE PRESENTATIONS

Ronen, R., Y. Attias, Y. Schechner, J. Jaffe, E. Orenstein. Plankton reconstruction through population-based optical tomography. IEEE International Conference on Computational Photography. Haifa, Israel. May 2021.

Orenstein, E.C., C. Briseño-Avena, P.L.D. Roberts, J.S Jaffe, P.J.S. Franks. High-temporal resolution in situ imaging and machine learning to observe copepod-parasite interactions. Ocean Sciences Meeting. San Diego, CA. February 2020.

Orenstein, E.C., M. Carter, P.J.S. Franks, J.S. Jaffe, P.L.D. Roberts. Out-of-the-box machine learning tools to bootstrap labeled data. Oceanology international: Americas. San Diego, CA. February 2019.

Kenitz, K.M., E.C. Orenstein, P.L.D. Roberts, P.J.S. Franks, J.S. Jaffe, M.L. Carter, and A.D. Barton. Patterns of occurrence in marine diatom chains. Gordon Research Conference on Marine Microbes. Lucca, Italy. July 2018. (**Poster**)

Orenstein, E.C., K.T. Le, M. Carter, N.M Vasconcelos, P.J.S. Franks, P.L.D. Roberts, J.S. Jaffe. Exploiting laboratory images for automated classifier improvement. Ocean Sciences Meeting. Portland, OR. February 2018. (**Poster**)

Barton, A.D., E.C. Orenstein, P.J.S. Franks, J.S. Jaffe, and F. Pomati. Temporal variability in plankton size spectra. Ocean Sciences Meeting. Portland, OR. February 2018.

Kenitz, K.M., E.C. Orenstein, P.L.D. Roberts, P.J.S. Franks, J.S. Jaffe, and A.D. Barton. Patterns of occurrence in marine diatom chains. Ocean Sciences Meeting. Portland, OR. February 2018. (**Poster**)

Mullen, A.D., P.L.D. Roberts, T. Treibitz, B. Laxton, E.C. Orenstein, and J.S. Jaffe. Microscopic Imaging Systems for Underwater and Extreme Environments. NASA Outer Planets Assessment Group. San Diego, CA. September 2017. (**Poster**)

Orenstein, E.C., P.M. Morgado, E.E. Peacock, J.S. Jaffe, and H.M. Sosik. Mining big data sets of plankton images: a zeroshot learning approach to retrieve labels without training data. Ocean Sciences Meeting. New Orleans, LA. February 2016. (**Poster**)

Orenstein, E.C., J.S Jaffe, P.L.D. Roberts. Oceans of (Image) Data. Scripps Student Symposium. San Diego, CA. September 2015.

Orenstein, E.C., O. Beijbom, E.E. Peacock, H.M. Sosik, and J.S. Jaffe. WHOI Plankton- A Large Scale Fine Grained Visual Recognition Benchmark Dataset for Plankton Classification. Third Annual Workshop on Fine-Grained Visual Categorization, IEEE Conference on Computer Vision and Pattern Recognition. Boston, MA. June 2015.

Roberts, P.L.D., J.S. Jaffe, E.C. Orenstein, B. Laxton, P.J.S. Franks, C. Briseño-Avena, M. Carter and M. Hilbern. Pier Recognition: An in situ plankton web camera (Scripps Plankton Camera). Ocean Optics. Portland, ME. October 2014.

INVITED PRESENTATIONS

Orenstein, E.C. The Free-est of Lunches: Using out-of-domain data to boost oceanographic image classification. Monterey Bay Aquarium Research Institute Seminar Series. Moss Landing, CA. May 2018

Orenstein, E.C. Plankton Ecology and the Rise of Big Data. Third Annual Workshop on Automated Analysis of Video Data for Wildlife Surveillance, IEEE Winter Conference on Applications of Computer Vision. Santa Rosa, CA. March 2017.

Orenstein E.C., J.S. Jaffe, P.J. Franks, N. Vasconcelos, P.M. Morgado. Quantifying Plankton Diversity with Taxonomy and Attribute Based Classifiers for Underwater Microscope Images. National Science Foundation BIGDATA PI Meeting. Washington, DC. March 2017.

SYNERGISTIC ACTIVITIES
- Panel reviewer: NOAA Office of Ocean Exploration and Research FY22 Ocean Exploration FFO
- Proposal reviewer: NOAA Office of Ocean Exploration and Research FY21 Ocean Exploration FFO
- Workshop organizer/tutorial leader: 2020 **Australian Commonwealth Scientific and Industrial Research Organization** Workshop on Imaging and Machine Learning for Oceanographic Observations and Monitoring
- Session chair: "Artificial Intelligence Systems for Advancing the Study of Aquatic Ecosystems" – Ocean Sciences 2020
- Workshop organizer/tutorial leader: 2019 **Partnership for Observing the Global Ocean** Workshop on Machine Learning and Artificial Intelligence in Biological Oceanographic Observations
- Participant: 2019 **University-National Oceanographic Laboratory System** Chief Scientist Training Program
- Session chair: "Machine learning in biological oceanography" – Ocean Sciences 2018
- Journal reviewer: Scientific Reports, Marine Ecology Progress Series, Journal of Plankton Research, Remote Sensing, Methods in Oceanography, IEEE Journal of Ocean Engineering, Frontiers in Microbiology, Computers and Geosciences, Microscopy Research and Technique
- Mentorship of undergraduates: Jennifer Peña (UCSD-Marine Biology), Lindsay Beatty (UCSD-Marine Biology), Kevin Le (UCSD-Electrical Engineering), Camila Obata (Federal University of Santa Catarina, Brazil)
- Writer/Editor: Oceanbites.org, a graduate student led science outreach blog

TEACHING:
- Instructor of record: SIO187 – Statistical Methods in Marine Biology (SP20)
- Instructor of record: SIO187 – Statistical Methods in Marine Biology (SP19)
- Teaching assistant: SIO187 – Statistical Methods in Marine Biology (SP17)
- National Science Foundation Graduate STEM Fellow in K-12 Education (2012)

COLLABORATORS:
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