

M. Jeffrey Mei

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EDUCATION

Massachusetts Institute of Technology, Cambridge, MA June 2015 – September 2020

Woods Hole Oceanographic Institution, Woods Hole, MA

Ph. D., Mechanical Engineering (major: Oceanographic Engineering; minor: Data Science) GPA: 4.7/5.0

- Dissertation: "Morphological Approaches To Understanding Antarctic Sea Ice Thickness"

New York University Abu Dhabi, Abu Dhabi, United Arab Emirates August 2011 – May 2015

B. S. cum laude, Physics and Mathematics.

GPA: 3.8/4.0

- New York University Honors Scholar, 2015

- Semester study abroad at NYU Berlin/Humboldt-Universität zu Berlin (Germany), Spring 2013

- Full scholarship, 2011 – 2015

RESEARCH EXPERIENCE

Graduate Research Assistant, MIT/WHOI Joint Program June 2015 – September 2020

- Applied convolutional neural networks to sea ice imagery to infer ice thickness and snow depth from surface topography, reducing error in sea ice thickness estimates from 50% to 20% (PyTorch, OpenCV, AWS EC2)
- Developed a textural segmentation algorithm to distinguish different deformed sea ice surfaces
- Increased amount of snow depth data available to researchers by 10x via textural extrapolation
- Collected sea ice data using surface laser (lidar) scans during 3-month winter fieldwork in Antarctica
- Created an interactive GUI for processing sea ice imagery (image segmentation) with OpenCV and Python

Undergraduate Research Assistant, NYU Abu Dhabi 2013 – 2015

- Created a method for localizing glacial collapse using signal processing (Fourier transforms, bandpass filtering)
- Visualized spectrograms to distinguish different types of seismicity (Python)

Select Peer-Reviewed Publications

- Mei, M.J., Maksym, T. A Textural Approach to Improving Snow Depth Estimates in the Weddell Sea. *Remote Sensing* **2020**, 12, 1494. [doi:10.3390/rs12091494](https://doi.org/10.3390/rs12091494)
- Mei, M.J., et al. Estimating Early-Winter Antarctic Sea Ice Thickness From Deformed Ice Morphology. *The Cryosphere* **2019**, 13, 11, 2915-2934. [doi:10.5194/tc-13-2915-2019](https://doi.org/10.5194/tc-13-2915-2019)

TEACHING AND LEADERSHIP EXPERIENCE

12.720 Elements of Modern Oceanography, MIT Fall 2018

Teaching assistant

- Explained physical oceanography concepts to 25 first-year graduate students with no prior physics experience
- Improved scientific rigor of students research projects with one-on-one feedback

Summer Math Review, WHOI 2017 – 2018

Organizer and instructor

- Organized courses and assigned instructors for summer math review for ~20 incoming graduate students
- Prepared class notes for and taught ordinary/partial differential equations, data analysis, numerical methods

MIT Badminton Club, MIT 2016 – 2020

Treasurer 2016 – 2019, President 2019 – 2020

- Managed club financials (annual budget \$8000), including equipment ordering and fundraising
- Oversaw player registration, facilities reservations and liaised with sponsors for the Boston Open (2nd-largest badminton tournament in the USA)

OTHER SKILLS

Fluent in English, German, Mandarin Chinese; conversant in Russian

Experienced with Python (numpy/sklearn/pytorch/pandas), SQL, AWS, OpenCV, Linux/Unix, bash, Latex