

M. Jeffrey Mei

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EDUCATION

Massachusetts Institute of Technology, Cambridge, MA June 2015 - August 2020 (expected)

Woods Hole Oceanographic Institution, Woods Hole, MA

Ph.D., MIT-WHOI Joint Program in Applied Ocean Science & Engineering. 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 September 2015-present

- 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 interactive GUI to visualize learned filters (OpenCV)

- Developed textural segmentation algorithm to distinguish different deformed sea ice surfaces (OpenCV, Python)

- Collected sea ice data using surface topography laser (lidar) scans during 3-month winter fieldwork in Antarctica

- Created an interactive GUI for processing sea ice imagery (segmentation, floe delineation) (OpenCV, Python)

Undergraduate Research Assistant, NYU Abu Dhabi 2013-2015

- Created a method for localizing glacial collapse using signal processing and hyperbolic geometry (Python)

- Visualized seismic spectrograms and bandpass-filtered signals to automate detection of seismic shock wave onset

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

- Mei, M. J., Maksym, T., Weissling, B., & Singh, H. 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

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, L^AT_EX, Linux/Unix, bash