M. Jeffrey Mei

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EDUCATION

Massachusetts Institute of Technology, Cambridge, MA June 2015 - August 2020
Woods Hole Oceanographic Institution, Woods Hole, MA
Ph.D., Oceanographic Engineering, MIT-WHOI Joint Program in Applied Ocean Science & Engineering
- Dissertation: "Morphological Approaches To Understanding Antarctic Sea Ice Thickness" GPA: 4.7/5.0

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 textural segmentation algorithm to distinguish different deformed sea ice surfaces (OpenCV, Python)
- Increased amount of snow depth data available to researchers by 10× 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
- 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

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