RUI CHEN

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EDUCATION

Massachusetts Institute of Technology (MIT) — Cambridge, MA
Woods Hole Oceanographic Institution (WHOI) — Woods Hole, MA
Ph.D. Candidate, MIT-WHOI Joint Program — Expected June 2021
Applied Ocean Science and Engineering — GPA: 4.9/5
National Science Foundation Graduate Research Fellowship

Northwestern University — Evanston, IL
B.A. with Honors, *Magna Cum Laude* — June 2016
Majors in Integrated Science, Physics, Earth Science — GPA: 3.88/4
NOAA Ernest F. Hollings Undergraduate Scholarship

RESEARCH

Research Interests: underwater acoustics, signal processing, machine learning, statistical modeling

Arctic Ocean Underwater Ambient Noise — July 2016 - Present
Graduate Research Assistant, MIT-WHOI — *Cambridge, MA*

- Investigate the effect of Arctic environmental changes on its underwater soundscape and acoustic propagation
- Characterize the spectral, spatial, and temporal features of ambient noise time series data collected during past Arctic expeditions using techniques such as wavenumber-frequency analysis, beamforming, and probabilistic transient event detection to identify how the noise pattern has changed over time (Matlab, Python)
- Model underwater acoustic propagation with varying environmental parameters using wavenumber integration and normal modes to correlate changes in the noise pattern to environmental shifts (OASES, Bellhop, Kraken)
- Develop a convolutional neural network approach to estimate the range of surface noise sources (Tensorflow, Keras, Scikit-Learn)
- Employ hierarchical clustering to automatically group transient noise features detected in data spectrograms (OpenCV, Python)

Arctic Ice Cover Cryo-seismic Monitoring — December 2018 - Present
Graduate Research Assistant, MIT-WHOI — *Woods Hole, MA*

- Collaborate with WHOI scientist to monitor Arctic ice cover activity near the coast of northern Alaska with a deployed planar geophone array to better understand ambient noise generation
- Design and implement an event detection algorithm built on match filtering combined with short/long time-window averaging and a localization technique using time-difference-of-arrival (Matlab, Python)

Cold, Diffuse Interstellar Clouds — September 2014 - June 2016
Undergraduate Research Assistant, Northwestern University — *Evanston, IL*

- Extracted and analyzed star UV spectrum data from telescope databases to determine cloud distance and density using the image reduction and analysis facility program (IRAF) to better understand star formation within these clouds

Tsunami Danger Threshold Modeling — Summer 2015
Research Intern, Pacific Tsunami Warning Center — *Honolulu, HI*

- Formulated a current velocity threshold for tsunami warning issuance by employing a 1-D shallow water model to simulate tsunami events and quantifying the human and economic impacts of the waves (Matlab)

TEACHING & ADVISING

Graduate Peer Career Advisor — MIT, September 2019 - Present

- Conduct >50 individual career advising appointments with undergraduate and graduate students to review resumes/cover letters and offer career counseling

Course Facilitator — MIT edX, November 2019 - May 2020

- Prepared and facilitated weekly online lessons with 20 students on machine learning topics following the ICAP framework

Teaching Assistant — MIT Environmental Ocean Acoustics Course, Fall 2018

- Led review sessions and prepared notes to explain course materials and coding projects on underwater acoustics modeling; deconstructed complex topics to simpler ideas so that they are better understood by students

SKILLS

Computer: Proficient in Matlab, Python, C++, OASES, Bellhop, Kraken. Familiar with HTML, JavaScript, NodeJS, React.
Language: Native fluency in English, Mandarin Chinese.