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 EXPERIENCE

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

- Investigate environmentally-induced changes to Arctic underwater ambient noise using signal processing techniques including time-frequency analysis, beamforming, and transient event detection & estimation using Matlab and Python
- Model and correlate underwater acoustic propagation to environmental variability using raytracing (Bellhop), wavenumber integration (OASES), and normal modes (Kraken)
- Develop a convolutional neural network approach using Tensorflow and Keras to estimate range of surface noise sources that exhibit 20% increase in accuracy and more robustness to environmental mismatch compared to conventional matched field method
- Implement image processing and hierarchical clustering with Python and OpenCV to automatically detect and group transient noise features in data spectrograms; allows for easier categorization of transients compared to amplitude-based approach

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 and localization algorithm that combines match filtering followed by time-difference-of-arrival estimate using Matlab; able to locate events within array perimeter with $< 10\%$ error

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 in Matlab to simulate tsunami events and quantifying the human and economic impacts of the waves

TEACHING & ADVISING

Graduate Peer Career Advisor — MIT Career Advising & Professional Development, September 2019 - Present

- Conducted >40 individual career advising appointments with undergraduate and graduate students to review resumes/cover letters and offer career counseling; 100% of students rated sessions as extremely helpful

Course Facilitator — MIT edX, November 2019 - May 2020

- Prepared and facilitated weekly online lessons for ∼20 students (industry professionals) on machine learning topics as part of MIT edX's MicroMasters program on Statistics and Data Science

Teaching Assistant — MIT Environmental Ocean Acoustics Course, Fall 2018 & 2020

- Led weekly recitations and advised students on coding projects in underwater acoustics modeling; guided novel programmers to produce functional raytracing, normal modes, and wavenumber integration codes

SKILLS

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