

RUI CHEN

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EDUCATION

Massachusetts Institute of Technology

Cambridge, MA

Woods Hole Oceanographic Institution

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

Relevant Coursework: Applied Machine Learning (6.862), Statistics for Engineers & Scientists (6.434)

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

Outstanding Student in Physics (2014, 2015)

Inductee, Phi Beta Kappa Society

ACADEMIC RESEARCH

Current Research Interests: Underwater acoustics, Arctic Ocean ambient noise, source characterization, signal processing, machine learning, statistical modeling.

Arctic Ocean Ambient Noise

MIT-WHOI, July 2016 - Present

- Explores the feasibility of extracting useful environmental information from Arctic Ocean ambient noise to better inform underwater communication and navigation strategies in the region.
- Analyzed recorded data to characterize the spectral, spatial, and temporal features of ambient noise.
- Demonstrated how recent Arctic environmental changes are reflected in differences in noise characteristics.
- Developed a robust method to estimate ranges of surface noise sources in an Arctic propagation environment with a convolutional neural network.

Arctic Ice Cover Monitoring

MIT-WHOI, Dec. 2018 - Present

- Evaluates the ability to monitor local ice cover activity with a planar geophone array.
- Implemented an event detection algorithm based on short/long time-window averaging and a localization method using time-difference-of arrival.
- Developing machine learning approaches to automatic event detection using extracted features from previously discovered events.

Cold, Diffuse Interstellar Clouds

Northwestern University, 2014 - 2016

- Examined the formation mechanism of abnormally cold interstellar clouds in a hot region of space.
- Extracted and analyzed star UV spectrum data from telescope databases to determine cloud distance and density.
- Calculated gas pressure within interstellar clouds to postulate their formation mechanism.

Tsunami Danger Threshold Modeling

National Tsunami Warning Center, 2015

- Developed a current velocity threshold for Tsunami warning issuance.

- Employed a 1-D shallow water model to simulate Tsunami events and quantified their human and economic impacts.

TEACHING

Teaching Assistant

MIT Course 2.681, Fall, 2018

- Led review sessions and prepared notes to explain course materials; often deconstructed complex topics to simpler ideas so that they are better understood by students.
- Actively responded to student questions and assisted in organizing student projects.

Tutor

Northwestern University, 2014 - 2016

- Mentored students in the Physics and Integrated Science departments on many subjects such as physics, math, and chemistry.
- Advised younger students with on coursework selection and post-undergraduate plans.
- Assisted applicants with revising resumes/CVs and personal/research statements for academic applications.
- Awarded the 2016 Integrated Science department Student Service Award.

LEADERSHIP AND VOLUNTEERING

MIT Concert Band

May 2019 - Present

Webmaster

- Actively maintains and updates the concert band website.

Weinberg College Student Advisory Board

Northwestern University, 2015 - 2016

Representative

- Gathered student feed-backs on curriculum and college policies and communicated their concerns to university administration.
- Organized social events for students in the Integrated Science Program such as formals and educational field trips.

Northwestern University Marching Band

2012 - 2016

Clarinetist

- Performed with the band at all Northwestern home football games and most Northwestern basketball games; developed excellent time management and organization skills.
- As a senior, led the clarinet section in pre-game preparations and planned social events to help new members integrate into both the band and Northwestern in general.

Charles B. Wang Community Health Center

Queens, NY, 2010 - 2012

Volunteer

- Promoted health center events and youth educational programs to patients with young children.
- Organized the health centers online patient database.

SKILLS AND INTERESTS

Computer: Proficient in MATLAB, Python (Numpy, Scipy, Scikit-Learn, Tensorflow, Keras), L^AT_EX.

Language: Fluent in Mandarin Chinese.

Interests: Clarinet performance, cooking, hiking.

PUBLICATIONS AND PRESENTATIONS

Publications:

R. Chen, A. Poulsen, and H. Schmidt. Spectral, spatial, and temporal characteristics of underwater ambient noise in the Beaufort Sea in 1994 and 2016. *J. Acoust. Soc. Am.*, 145(2):605614, 2019.

Presentations:

R. Chen, A. Poulsen, and H. Schmidt. Beaufort Sea ambient noise characteristics in 1994 and 2016. Acoustical Society of America Fall Meeting (2018).

R. Chen and D. Wang. A study on the Tsunami warning thresholds based on Tsunami currents. American Geophysical Union Fall Meeting (2015).