Thomas Andrew Lee

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Education

Harvard University, Cambridge, MA
Graduate Student in Earth and Planetary Sciences
Enrolled Fall 2019, Expected Graduation Spring 2025

Harvard University, Cambridge, MA
Class of 2019, A.B. in Earth and Planetary Sciences,
Cum Laude in Field, High Honors

Waiakea High School, Hilo, HI
Class of 2015, Class Salutatorian

Research Experience

Earth and Planetary Science Department, Harvard University, Cambridge, MA
Seismology Research Group, Graduate Student (September 2019 – Present)
Advisors: Prof. Miaki Ishii & Dr. Paul Okubo (University of Hawai`i)
Continued work from undergraduate research broadly concerning novel uses of analog seismic data (especially with relation to problems in volcano seismology) and solutions to important problems that must be considered when using this unique data.

Earth and Planetary Science Department, Harvard University, Cambridge, MA
Seismology Research Group, Undergraduate Research Assistant (February 2016 – August 2019)
Advisor: Prof. Miaki Ishii & Dr. Paul Okubo (USGS)
Work on interpretation of ambient seismic noise correlations in volcanic environments, time synchronization of analog seismograms across stations, digitization of analog seismograms with DigitSeis program, and applications of machine learning to improve digitization algorithms.

United States Geological Survey, Hawai'i Volcanoes National Park, HI
Hawaiian Volcano Observatory, Visiting Scientist (Summer 2017 and 2018)
Advisor: Dr. Paul Okubo
Worked on preservation and digitization of the analog seismogram collection at the observatory and collected data to work on time synchronization of analog records. Took part in field work related to the 2018 eruptive activity of Kīlauea.

Teaching Experience

Freshman Seminar 23I: Geoscifi Movies Harvard University, Cambridge, MA
Teaching Fellow (Fall 2020, Spring 2021)

Prepared materials for and helped with instruction. Students watch blockbuster films involving natural disasters then are guided through basic science and back-of-the-envelope calculations to determine the feasibility of what is shown on screen.

General Education 1137: The Challenge of Human Induced Climate Change: Transitioning to a Post Fossil Fuel Future Harvard University, Cambridge, MA
Teaching Fellow (Spring 2021)
Prepared materials for and taught section. Students learn background information about the science and politics of the climate problem and then are guided through research of their own to culminate in a comprehensive final paper examining a specific issue relevant to climate and energy.

Freshman Seminar 23I: Montserrat Role-Playing Game, Harvard University, Cambridge, MA
Supervisor (Fall 2018)
Provided guidance for participants in freshman seminar role-playing game involving responses and interactions to natural disasters by scientists, governments, and communities.

Summer Bridge Program, Waiakea High School, Hilo, HI
AmeriCorps VISTA Summer Associate (Summer 2015 and 2016)
Worked with incoming 9th Graders to help build strong math and science skills in preparation for high-school geometry and biology.

HONORS and AWARDS

Harvard Bok Center: Certificate of Distinction in Teaching – Fall 2020, Spring 2021

American Geophysical Union Outstanding Student Presentation Award – 2019

Bowdoin Prize: Undergraduate Essay in the Natural Sciences – 2019

Hoopes Prize – 2019

Incorporated Research Institutions for Seismology Student Travel Grant – 2018

Harvard College Undergraduate Research Program Grant – 2018, 2017

Department of Earth and Planetary Sciences Student Travel Grant – 2018, 2017

SERVICES

Session Co-chair: Back to the Future: Innovative New Research with Legacy Seismic Data, Annual Meeting 2021, SSA, online, 19-23 Apr.

PROPOSALS and FUNDING

U.S. Department of State: Investigating the Feasibility of Extracting Digital Data from Analog Microform Seismogram, 19AQMM20P1475, *Fall 2020 – Fall 2021*
Contributed significantly to the writing of and partially funded by this proposal.

U.S. Geological Survey: Implementation of Curvature Correction in DigitSeis for Pen-Type Analog Seismograms, Grant Number G20AS00042, *FY 2021*
Contributed significantly to the writing of and partially funded by this proposal.

PUBLICATIONS

Lee, T., Ishii, M., & Okubo, P. (2020). Relative Time Corrections for Historical Analog Seismograms Using the Single-Day Ambient Noise Correlation Function. *Bulletin of the Seismological Society of America*.

Ishii, M., H. Ishii, and T. Lee (2019, in preparation). DigitSeis v1.3 and Factors Affecting Seismogram Digitization, to be submitted to the *Seismological Research Letters.*

Lee, T. (2019), Detection of a "Silent" Magma Intrusion Using Ambient Seismic Noise Autocorrelation Functions from the 2018 Kīlauea, Hawai`i Eruption, Senior Thesis, Harvard University, Cambridge, MA.

Lee, T. (2018). *DigitSeis v1.3: User Manual*. Cambridge, MA: Harvard Seismology. Available at http://seismology.harvard.edu/downloads/DigitSeis/DigitSeis1.3/DigitSeis_Manual_1.3.pdf

Lee, T. (2017). *DigitSeis v1.1: User Manual*. Cambridge, MA: Harvard Seismology. Available at http://seismology.harvard.edu/downloads/DigitSeis/DigitSeis1.1/DigitSeis1.1_Manual.pdf

PRESENTATIONS

*Invited

Lee, T., M. Ishii, and P. Okubo (2021). Digitized Legacy Data: Original Paper v. Microform Copies, presented at Joint Scientific Assembly, IAGA-IASPEI, online, 21-27 Aug.

Lee, T., M. Ishii, and P. Okubo (2021). Fidelity of Legacy Data Across Different Media Types, presented at 2021 Annual Meeting, SSA, online, 19-23 Apr.

*Lee, T., M. Ishii, and P. Okubo (2020). The Future is the Past: Challenges with and the Scientific Value of Legacy Seismic Data, presented at 2020 Annual Meeting, AGU, online, 1-17 Dec.

Lee, T., M. Ishii, and P. Okubo (2019). Relative Time Corrections for Digitized Analog Seismograms via the Noise Correlation Function, presented at 2019 Annual Meeting, AGU, San Francisco, CA, 9-13 Dec.

Lee, T., M. Ishii, H. Ishii, and T. Morinaga (2019). Moving Forward by Looking Back: Utilization of Legacy Seismic Data in the Modern Age, presented at 2019 Annual Meeting, AGU, San Francisco, CA, 9-13 Dec.

*Lee, T., M. Ishii, H. Ishii, and T. Morinaga (2019). The Potential of Analog Seismograms for Science and Education, presented at Securing Legacy Seismic Data to Enable Future Discoveries, NSF Supported Workshop, Albuquerque, NM, 18-19 Sep.

*Lee, T., and M. Ishii (2019). Demonstration of DigitSeis.v.1.5 (Breakout Session), presented at Securing Legacy Seismic Data to Enable Future Discoveries, NSF Supported Workshop, Albuquerque, NM, 18-19 Sep.

*Lee, T., and M. Ishii (2019). Relative Time Corrections for Digitized Analog Records, presented at Securing Legacy Seismic Data to Enable Future Discoveries, NSF Supported Workshop, Albuquerque, NM, 18-19 Sep.

Lee, T., M. Ishii, and P. Okubo (2019), Interpretations of and Proposed Model for Progressive Decorrelation of Auto-Correlation Functions on the East Rift Zone of Kīlauea during the Volcanic Activity of 2018, presented at 2019 Annual Meeting, SSA, Seattle, WA, 23-26 Apr.

Lee, T., M. Ishii, and H. Ishii (2019). DigitSeis: Near-Fully Automated Conversion of Paper Seismograms to Digital Time Series, presented at 2019 Annual Meeting, SSA, Seattle, WA, 23-26 Apr.

M., Ishii, T. Morinaga, and T. Lee (2019). The Potential of Analogue Seismograms for Science and Education, presented at 2019 Annual Meeting, SSA, Seattle, WA, 23-26 Apr.

Lee, T., M. Ishii, and P. Okubo (2018). Temporal Velocity Changes on the East Rift Zone of Kīlauea Concurrent with the Volcanic Activity of 2018 Interpreted from Changes in Single-Station Correlation Functions, Abstract V43J-0300 presented at 2018 Fall Meeting, AGU, Washington, D.C., 10-14 Dec.

Lee, T., M. Ishii, and J. Taber (2018). DigitSeis: Opportunities for Digitization of Analog Seismograms Through Educators and Citizen Science, Abstract ED51C-0683 presented at 2018 Fall Meeting, AGU, Washington, D.C., 10-14 Dec.

Lee, T., M. Ishii, and P. Okubo (2018). Consistent inconsistencies: A new method for assessing time corrections needed for analog seismograms, Poster M1 presented at 2018 Workshop, IRIS, Albuquerque, NM, 12-14 Jun.

Lee, T., and M. Ishii (2017). Teleseism-based relative time corrections for modern analyses of digitized analog seismograms, Abstract S21C-0769 presented at 2017 Fall Meeting, AGU, New Orleans, LA, 11-15 Dec.

SKILLS

Programming – Julia (primary language), MATLAB (primary language), Python, and R

Specialty Software – DigitSeis, SLURM, SAC, Basic HTML

Writing and Graphics – LaTeX, Adobe Illustrator, Adobe Photoshop, PowerPoint

EXTRACURRICULARS

Harvard Earth and Planetary Sciences Geo Club
Treasurer (September 2019 – Present)

Harvard College Hawai`i Club
President (May 2018 - May 2019), *Treasurer* (May 2016 - May 2018)

Harvard College Geosociety
Board Member (May 2018 – May 2019)

Music In Hospitals and Nursing-homes Using Entertainment as Therapy
Treasurer (January 2016 – January 2018)