

CHIH-HSUAN SUNG

Postdoctoral Researcher

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add. Davis Hall, UC Berkeley, CA 94720

Birth: Dec.30.1984

Gender: Female

EDUCATIONAL

PHD (2008-2016)

Graduate Institute of Applied Geology,
National Central University, Taiwan

MA (2007-2008)

Graduate Institute of Applied Geology,
National Central University, Taiwan

BA (2003-2007)

Department of Earth Science, National Central
University, Taiwan

AWARDS & SCHOLARSHIPS

2012-2009 Sinotech Foundation for Research and
Development of Engineering Science
and Technologies

2008-2009 National Central University Merit
Scholarship

INVITED TALKS

- 2022** • Fully Non-ergodic ground-motion
models for Taiwan, 8th Asia Conference
on Earthquake Engineering (8ACEE) on
November 9-11, 2022.

CAMPUS TALKS

- 2022** • Non-ergodic ground motion for Taiwan,
National Chung Hsing University, November
27, 2022.

- 2021** • Impacts of non-ergodic ground motion
models on hazard, National Central
University, April 16, 2021.

EXPERTISE

Ground motion prediction equations (GMPEs),
Probabilistic seismic hazard analysis (PSHA),
Geostatistics, Geographic information system,
Earthquake Engineering, Machine learning (ML).

SKILLS

- Ground Motion Model Development, Hazard
Evaluation/Application, Data Analysis.
- R software, STAN, FORTRAN, Python, Haz45,
Mapinfo, Surfer, Grapher.

EXPERIENCE

POSTDOCTORAL RESEARCHER

- Pacific Earthquake Engineering Research
Center, 2019–Present
- UC Berkeley, Civil and Environmental
Engineering, 2019–Present
- National Central University, Graduate
Institute of Applied Geology, 2016–2018

VISITING SCHOLAR

- Swiss Federal Institute of Technology in
Zurich (ETH), Schweiz. Erdbebendienst
(SED), Engineering Seismology, 2015

PROJECTS AND PROGRAM

- Pacific Earthquake Engineering Research Center,
University of California, Berkeley (2022-2023):
Modeling Non-ergodic Path Effects from MMI
data.
- United States Geological Survey (2021 - 2022):
Modeling Path Effects Due to 3-D Velocity
Structure in Non-Ergodic Ground-Motion
Model.
- United States Geological Survey (2020 - 2021):
Nonergodic Ground Motion Models for
Magnitude 9 Earthquakes on the Cascadia
Megathrust Based on 3D Simulations and
Stochastic Synthetics.
- Seismic Ground Motion Assessment Project - V2
(EDF - France, PG&E - USA, SwissNuclear -
Switzerland, CEZ - Czech Republic, CEA -
France, Orano - France, CRIEPI - Japan), (2019-
2021): WP5: Implementation of Non-Ergodic
Ground Motion Prediction Equations in
Probabilistic Seismic Hazard Analysis for France.
- Taiwan Earthquake Disaster Program (2008 -
2010): Site- Specific Strong- Motion Attenuation
Relationship, and Single site and single source-
region strong-motion attenuation relationship
and variance decomposition

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PUBLICATIONS - INTERNATIONAL JOURNAL

2022

- **Sung, C.H.**, N. A. Abrahamson (2022) Nonergodic Ground Motion Models for Magnitude 9 Earthquakes on the Cascadia Megathrust Based on 3D Simulations and Stochastic Synthetics, Bulletin of the Seismological Society of America, doi: 10.1785/0120210330.
- **Sung, C.H.**, N. A. Abrahamson, N. M. Kuehn, P. Traversa, and I. Zentner (2022) A Nonergodic Ground Motion Model of Fourier Amplitude Spectra for France, Bulletin of Earthquake Engineering, doi:10.1007/s10518-022-01403-1.

2021

- **Sung, C.H.**, N. A. Abrahamson, and J.Y. Huang (2021) Conditional Ground-Motion Models for Horizontal Peak Ground Displacement for Active Crustal Regions, Bulletin of the Seismological Society of America, 111 (3): 1542–1562.

2019

- **Sung, C. H.** and C. T. Lee (2019) Improvement of the Quantification of Epistemic Uncertainty Using Single-Station Ground-Motion Prediction Equations, Bulletin of the Seismological Society of America, 109 (4), 1358–1377.

2016

- **Sung, C. H.** and C. T. Lee (2016) A New Methodology for Quantification of the Systematic Path Effects on Ground-Motion Variability, Bulletin of the Seismological Society of America, 106(6), 2796–2810.

2012

- Lee, C. T., P. S. Lin, B. S. Hsieh, and **C. H. Sung** (2012). Regional Arias intensity attenuation relationship for Taiwan with considering Vs30, Bulletin of the Seismological Society of America, 102(1), 129–142

2011

- Lin, P. S., C. T. Lee, C. T. Cheng, and **C. H. Sung** (2011). Response spectral attenuation relations for shallow crustal earthquakes in Taiwan, Engineering Geology, 121, 150–164.

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PUBLICATIONS - INTERNATIONAL JOURNAL (REVISION/PREPARATION)

Revision

- Huang, J.Y., **C.H. Sung**, S.H. Chao, and N. A. Abrahamson, (2022) Including Radiation Pattern Effects in Ground-Motion models for Taiwan, Bulletin of the Seismological Society of America (Revision Submitted).
- Huang, J.Y., N. A. Abrahamson, S.H. Chao, and **C.H. Sung**, (2022) New Insight on Empirical Source Scaling Law for Crustal Events Incorporating the Fault Dip Angle and Seismogenic Thickness Effects, Seismological Research Letters (in Revision).

Preparation

- **Sung, C.H.**, N. A. Abrahamson, and M. Lacour (2022) Modeling 3-D Path Effects in Non-Ergodic Ground-Motion Models, Bulletin of the Seismological Society of America (in preparation).
- **Sung, C.H.**, N. A. Abrahamson, and J.Y. Huang (2022) Nonergodic Ground Motion Models of Fourier Amplitude Spectra for Crustal Earthquakes in Taiwan, Bulletin of the Seismological Society of America (in preparation).
- **Sung, C.H.**, N. A. Abrahamson (2022) Non-ergodic Ground-Motion Models for the Wasatch Front, Utah Based on Empirical data and 3-D Simulation, Bulletin of the Seismological Society of America (in preparation).
- **Sung, C.H.**, N. A. Abrahamson (2022) Comparison of the Cascadia Partially Non-ergodic GMM for the Broadband and Small Regions using M9 Interface Earthquakes, Bulletin of the Seismological Society of America (in preparation).

PUBLICATIONS - CONFERENCE

2022

- **Sung, C. H.**, N. A. Abrahamson, and et al (2022). Fully Non-ergodic ground-motion models for Taiwan, 8th Asia Conference on Earthquake Engineering (8ACEE) on November 9-11, 2022.
- **Sung, C. H.**, M. C. Hsieh, and N. A. Abrahamson (2022). Non-Ergodic Ground-Motion Model For Taiwan Subduction Earthquakes Using 3-D Simulations, 8th Asia Conference on Earthquake Engineering (8ACEE) on November 9-11, 2022.
- **Sung, C. H.**, N. A. Abrahamson, and et al (2022). Non-ergodic Ground-Motion Model for the Wasatch Front, Utah, 12th National Conference on Earthquake Engineering (12NCEE) on June 27 - July 1, 2022.

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CONFERENCE ACTIVITY/PARTICIPATION

2022

Talks

- **Sung, C. H.**, N. A. Abrahamson, and et al (2022). Fully Non-ergodic ground-motion models for Taiwan, 8th Asia Conference on Earthquake Engineering (8ACEE) on November 9-11, 2022.
- **Sung, C. H.**, M. C. Hsieh, and N. A. Abrahamson (2022). Non-Ergodic Ground-Motion Model For Taiwan Subduction Earthquakes Using 3-D Simulations, 8th Asia Conference on Earthquake Engineering (8ACEE) on November 9-11, 2022.
- **Sung, C. H.** and N. A. Abrahamson (2022). Probabilistic Seismic Hazard Analysis in Seattle Using Non-ergodic GMMs Based on 3D Simulation Results for Cascadia Interface Earthquakes, SSA 2022 Annual Meeting.
- Abrahamson, N. A., **C. H. Sung**, and M. Lacour (2022). New Approach for Modeling 3D Path Effects From Cybershake Simulations in Non-ergodic Ground-motion Models, SSA 2022 Annual Meeting.
- Abrahamson, N. A., **C. H. Sung** (2022). Move To Non-Ergodic Ground-Motion Models For PSHA In Usha, Basin and Range Earthquake Summit, 2022.
- **Sung, C. H.** M. C. Hsieh, and N. A. Abrahamson (2022) Non-Ergodic Ground-Motion Model for Taiwan Subduction Earthquakes Based on 3-D Simulations, Taiwan-Japan-New Zealand Workshop on Earthquake Hazard, 2022.
- **Sung, C. H.**, N. A. Abrahamson, and et al (2022). Non-ergodic Ground-Motion Model for the Wasatch Front, Utah, 12th National Conference on Earthquake Engineering (12NCEE) on June 27 - July 1, 2022.

Posters

- Huang, J., **Sung, C.**, Chao, S., Abrahamson, N (2022). Including Radiation Pattern Effects in Ground motion Models for Taiwan, SSA 2022 Annual Meeting.
- Lacour, M., Abrahamson, N., **Sung, C** (2022). Implementing Non-ergodic Ground-motion Models in Probabilistic Seismic Hazard Programs, SSA 2022 Annual Meeting.

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CONFERENCE ACTIVITY/PARTICIPATION

2021

Talks

- **Sung, C. H.** and N. A. Abrahamson (2021) Incorporation of 3-D Simulation Results Into Non-ergodic Ground-Motion Models: A Case of Megathrust Earthquakes on Cascadia Subduction Zone, Taiwan-Japan-New Zealand Workshop on Earthquake Hazard, 2021.
- **Sung, C. H.** and N. A. Abrahamson (2021) Partially Non-ergodic Ground-Motion Model for the Cascadia Subduction Zone, LA, CA, U.S.A.
- **Sung, C. H.** and N. A. Abrahamson, N. M. Kuehn, P. Traversa, and I. Zentner (2021). Development of a Non-ergodic Ground Motion Model for France, SSA 2021 Annual Meeting.

2020

Talks

- **Sung, C. H.** and N. A. Abrahamson, and J.Y. Huang (2020). Development of a Non-ergodic Ground Motion Model for France, EGU General Assembly 2020 Program.
- **Sung, C. H.** and N. A. Abrahamson, and J.Y. Huang (2020). Taiwan Conditional Prediction Equation for Horizontal PGD for Crustal Sources, EGU General Assembly 2020 Program.

Posters

- **Sung, C. H.** and N. A. Abrahamson, and J.Y. Huang (2020). Taiwan Non-ergodic Ground Motion Model, 2020 Annual Congress of Chinese Geophysical Society and Geological of Taiwan, Nov 2020.
- **Sung, C. H.** and N. A. Abrahamson, and J.Y. Huang (2020). Conditional Ground-Motion Model for Horizontal Peak Ground Displacement for Active Crustal Regions, 2020 Annual Congress of Chinese Geophysical Society and Geological of Taiwan, Nov 2020.

2019

Posters

- **Sung, C. H.**, N. A. Abrahamson, and J.Y. Huang (2019). Taiwan Conditional Prediction Equation for Horizontal PGD for Crustal Sources, American Geophysical Union fall meeting, San Francisco, CA, U.S.A.

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CONFERENCE ACTIVITY/PARTICIPATION

2018-2012

Talks

- **Sung, C. H.** and C. T. Lee (2018) The Purification of the Epistemic Uncertainty by Single-Station Ground-Motion Prediction Equations, 2018 Annual Congress of Chinese Geophysical Society and Geological of Taiwan, May 2018.
- **Sung, C. H.** and C. T. Lee (2018). Application of Standard Deviation for Single-station Ground motion Prediction Model in a Probabilistic Seismic-hazard Analysis, 2018 Japan Geoscience Union, May 2018.
- **Sung, C. H.** and C. T. Lee (2017). Analysis of Systematic Path Effects from Ground-Motion Variability Using Different Path-Bin Plans, 2017 Japan Geoscience Union, May 2017.
- **Sung, C. H.** and C. T. Lee (2014). Single-Path Sigma from a Huge Dataset in Taiwan, EGU General Assembly 2014 Program.
- **Sung, C. H.** and C. T. Lee (2013). Aleatory Variability of Ground-motion Attenuation Residuals EGU General Assembly 2013 Program.

Posters

- **Sung, C. H.** and C. T. Lee (2018). Meinong Reservoir Project: An improved seismic hazard analysis for Meinong reservoir by site-dependent GMPEs, 2018 Japan Geoscience Union, May 2018.
- **Sung, C. H.** and C. T. Lee (2017). Analysis of Single-Station Sigma Using Single-station GMPE by Huge Ground-Motion Data in Taiwan, 2017 PSHA workshop, September 2017, Switzerland.
- **Sung, C. H.**, C.C. Chao, and C. T. Lee (2017). Single-station and Small-source Regions GMPEs, 2017 PSHA workshop, September 2017, Switzerland.
- **Sung, C. H.** and C. T. Lee (2014). Single-Path Sigma and Spatial Correlation of GMPE Residuals Deduced from a Huge Dataset in Taiwan, American Geophysical Union fall meeting, San Francisco, CA, U.S.A..
- **Sung, C. H.** and C. T. Lee (2013). Aleatory Variability of Ground-motion Attenuation Residuals, American Geophysical Union fall meeting, San Francisco, CA, U.S.A.
- **Sung, C. H.** and C. T. Lee (2012). Analysis of Single-Path Sigma Using SMART-1 Array Data in Taiwan, EGU General Assembly 2012 Program.