LUIS CEFERINO

ceferino@berkeley.edu
www.luisceferino.com

Office Address
773 Davis Hall
Berkeley, CA 94720

PROFESSIONAL ASSOCIATIONS

UNIVERSITY OF CALIFORNIA, BERKELEY **California, USA**
Assistant Professor 2024 – Present
Civil and Environmental Engineering Department

NEW YORK UNIVERSITY **New York, USA**
Assistant Professor 2021 – 2023
Civil and Urban Engineering Department
Center for Urban Science and Progress

PRINCETON UNIVERSITY **New Jersey, USA**
Distinguished Postdoctoral Fellow at Andlinger Center for Energy and the Environment &
Civil and Environmental Engineering Department 2019 – 2020
Advisor: Ning Lin

EDUCATION

STANFORD UNIVERSITY **California, USA**
PhD Civil and Environmental Engineering 2015 – 2019
Thesis project: "Effective emergency response policies for hospital systems in the wake of time-varying seismic hazard"
Advisors: A. Kiremidjian and G. Deierlein. *Committee:* J. Baker, J. Mitrani-Raiser, and W. Ellsworth

STANFORD UNIVERSITY **California, USA**
MS Structural Engineering and Geomechanics 2013 – 2014

UNIVERSIDAD NACIONAL DE INGENIERÍA **Lima, Peru**
Bachelor of Science in Civil Engineering 2007 – 2011
Rank: #1/104
Thesis project: "Evaluation of the effective flange width for low-ductility reinforced concrete (RC) walls through nonlinear, Finite Element Modeling (FEM) verified by experimental tests" 2013
Advisor: C. Zavala

FUNDING, AWARDS & HONORS

Research Funding:
- C2SMART Funding – Lead PI ($ 85k) 2022
- NYU Climate Change Seed Funding – Lead PI ($10k) 2021

Scholarships:
- Distinguished Fellowship at Andlinger Center ($130k), Princeton University 2019 – 2020
- "John A. Blume" Fellowship, Stanford University 2017 – 2018
- "Shah Family" Fellowship, Stanford University 2015 – 2016
- "Andrés del Castillo" Fellowship 2013

- "Peruvian President" Fellowship   2013

Awards:
- EERI Student Grant for the National Conference on Earthquake Engineering (NCEE)   2018
- 2nd place in contest of undergraduate research presentations in National Congress of Civil Engineering Students (CONEIC) in Peru   2013
- 1st place in undergraduate contest of knowledge on Civil Engineering in CONEIC in Peru   2011
- Prize "Manuel Pardo y Lavalle" for top academic performance in Civil Engineering's undergraduate cohort   2010
- #8/4277 in National University of Engineering's admission contest   2007

JOURNAL PUBLICATIONS

[J1] Arora, P., **Ceferino, L.** (In Review). A Quasi-binomial Regression Model for Hurricane-induced Power Outages during Early Warning. *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering*

[J2] Merino, E., **Ceferino, L.**, Pizarro, S., de la Llera, J. C. (In Review). Modeling Hospital Resources based on Global Epidemiology after Earthquake-Related Disasters. *Earthquake Spectra*.

[J3] Liu, C., Macedo, J., Kottke, A., **Ceferino, L.** (2024). Impact of Ergodic and Non-ergodic Ground Motion Estimation on the Earthquake Resilience of Shared Distributed Energy Resource Systems. *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering,* 10 (1).

[J4] Avraam, C., **Ceferino, L.**, Dvorkin, Y. (2023). Operational and Economy-Wide Impacts of Compound Cyberattacks and Extreme Weather Events on Electric Power Networks. *Applied* Energy, 349 (121577).

[J5] **Ceferino, L.**, & Lin, N. (2023). Hurricane Risk of Solar Generation in the United States. *ASCE Natural Hazards Review*. 24 (4), 04023029:1-12.

[J6] Arora, P., **Ceferino, L.** (2023). Probabilistic and machine learning methods for uncertainty quantification in power outage prediction due to extreme events. *Natural Hazards and Earth System Sciences*, 23 (5), 1665–1683.

[J7] **Ceferino, L.**, Lin, N., & Xi, D. (2023). Bayesian Updating of Solar Panel Fragility Curves and Implications of Higher Panel Strength for Solar Generation Resilience. *Reliability Engineering & Structural Safety*, 229 (108896).

[J8] Alisjahbana, I., **Ceferino, L.**, Kiremidjian, A. (2023). Prioritized Reconstruction of Healthcare Facilities after Earthquakes based on Recovery of Emergency Services. Risk Analysis, 43 (9), 1763–1778.

[J9] Mota, R., Ferreira, N., Silva, J. D., Horga, M., Lage, M., **Ceferino, L.**, Alim, U., Sharlin, E. & Miranda, F. (2022) A Comparison of Spatiotemporal Visualizations for 3D Urban Analytics. *IEEE transactions on visualization and computer graphic.*

[J10] Hariri-Ardebili MA, Sattar S, Johnson K, Clavin C, Fung J, **Ceferino L.** (2022). A Perspective towards Multi-Hazard Resilient Systems: Natural Hazards and Pandemics. *Sustainability*. 14(8):4508.

[J11] **Ceferino, L.**, Lin, N. & Xi, D. (2022) Stochastic modeling of solar irradiance during hurricanes. *Stochastic Environmental Research and Risk Assessment*, 36, 2681–2693.

[J12] **Ceferino, L.**, Galvez, P., Ampuero, J.-P., Kiremidjian, A., Deierlein, G., & Villegas-Lanza, J. C. (2021). Bayesian Parameter Estimation for Space and Time Interacting Earthquake Rupture Model Using Historical and Physics-Based Simulated Earthquake Catalogs. *Bulletin of the Seismological Society of America,* 111 (6): 3356–3373.

[J13] Patel, S., **Ceferino, L.**, Liu, C., Kiremidjian, A., & Rajagopal, R. (2021). The disaster resilience value of shared rooftop solar systems in residential communities. *Earthquake Spectra*, June, 1–24.

[J14] **Ceferino L.**, Mitrani-Reiser J., Kiremidjian A., Deierlein G., Bambarén, Celso (2020). "Effective Plans for Hospital System Response to Earthquake Emergencies". *Nature Communications*, 11, 4325.

[J15] **Ceferino, L.**, Kiremidjian, A., and Deierlein, G. (2020). "Probabilistic space- and time-interaction modeling of main-shock earthquake rupture occurrence". *Bulletin of Seismological Society of America*. 110 (5): 2498-2518.

[J16] **Ceferino L.**, Kiremidjian A., and Deierlein G. (2018). "Regional Multi-severity Casualty Estimation Due to Building Damage Following a Mw 8.8 Earthquake in Lima, Peru". *Earthquake Spectra*, 4(3).

[J17] **Ceferino L.**, Kiremidjian A., and Deierlein G. (2018). "Probabilistic Model for Regional Multi-severity Casualty Estimation due to Building Damage Following Earthquakes. *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering*, 4(3), 04018023.

[J18] Markhvida M., **Ceferino L.**, and Baker J. (2017). "Modeling spatially correlated spectral accelerations at multiple periods using principal component analysis and geostatistics". *Journal of Earthquake Engineering and Structural Dynamics*, 47(5), 1107-1123.

[J19] Noh H.Y., Kiremidjian A., **Ceferino L.**, and So E. (2017). "Bayesian Updating of Earthquake Vulnerability Functions with Application to Mortality Rates". *Earthquake Spectra*, Vol. 33, No. 3, pp. 1173-1189.

[J20] Lallemant D., Burton H., **Ceferino L.**, Bullock Z., and Kiremidjian A. (2017). "A Framework and Case Study for Earthquake Vulnerability Assessment of Incrementally Expanding Buildings". *Earthquake Spectra*, 33(4).

[J21] Zavala C., Gibu P., Lavado L., Taira J., Cárdenas L., and **Ceferino L.** (2012). "Cyclic Behavior of Low Ductility Walls Considering Perpendicular Action". *Journal of Disaster Research*, 8(2), 313.

CONFERENCE PRESENTATIONS AND REPORTS

[C1] Arora, P. & **Ceferino, L.** (2023). A performance-based probabilistic framework to model risk to power systems from hurricanes. *In 14th International Conference on Applications of Statistics and Probability in Civil Engineering*, Dublin, Ireland.

[C2] Arora, P. & **Ceferino, L.** (2023). Could rooftop solar panels and storage have enhanced the electricity resilience during Hurricane Isaias (2020)? *In 14th International Conference on Applications of Statistics and Probability in Civil Engineering*, Dublin, Ireland.

[C3] Negri, R., Fernandez, M., Tan, B. Y. & **Ceferino, L.** (2023). Investigating the Use of Citizen-Science Data as a Proxy for Flood Risk Assessment in New York City. *In 14th International Conference on Applications of Statistics and Probability in Civil Engineering*, Dublin, Ireland.

[C4] Avraam, C., Dvorkin, Y. & **Ceferino, L.** (2023). Risk of New York City's Electric Power Networks Against Compound Extreme Floodings and Cyberattacks. *In 14th International Conference on Applications of Statistics and Probability in Civil Engineering*, Dublin, Ireland.

[C5] **Ceferino, L.**, Kukunoor, C., Mao, D., Xu, X. & Wu, J. (2023). Combining Seismic Risk Analysis and Network Modeling to Assess Hospital Service Accessibility in the Bay Area , California. *In 14th International Conference on Applications of Statistics and Probability in Civil Engineering*, Dublin, Ireland.

[C6] **Ceferino, L.,** Martin, A., & Bambarén, C. (2022). Hospital System Response to Earthquakes in the COVID-19 Pandemic. *The 12th National Conference on Earthquake Engineering*, Salt Lake City, US.

[C7] **Ceferino, L.**, Lin, N., & Xi, D. (2020). Distributed Energy Resources for Disaster Resilience to Hurricanes in a Changing Climate. In American Geophysical Union Fall Meeting.

[C8] **Ceferino, L.**, Mitrani-Reiser, J., Kiremidjian, A., Deierlein, G., & Bambarén, C. (2020). Informing Emergency Response of Hospital Systems after Moderate and Large Earthquakes in Lima, Peru. In 17th World Conference on Earthquake Engineering, 6c – 0003, Tokyo, Japan.

[C9] **Ceferino, L.**, Liu, C., Alisjahbana, I., Patel, S., Sun, T., Kiremidjian, A., & Rajagopal, R. (2020). Earthquake resilience of distributed energy resources. In 17th World Conference on Earthquake Engineering, Tokyo, Japan.

[C10] Markhvida, M., Cremen, G., Grujic, O., **Ceferino, L.**, & Baker, J. (2020). Methods for Evaluation and Treatment of Epistemic Uncertainty in Portfolio Losses Due to Earthquakes. In 17th World Conference on Earthquake Engineering, 1–10, Tokyo, Japan.

[C11] **Ceferino L.**, Mitrani-Reiser J., Kiremidjian A., and Deierlein G. (2018). "Computing Hospital System Resilience: A Supply-Demand Perspective". In 11th National Conference in Earthquake Engineering, Earthquake Engineering Research Institute, Los Angeles, US.

[C12] **Ceferino L**., Kiremidjian A., and Deierlein G. (2018). "Parameter Estimation Methods for Modeling of Time and Space Interactions of Earthquake Rupture". In 16th European Conference in Earthquake Engineering, Thessaloniki, Greece.

[C13] **Ceferino L.**, Kiremidjian A., and Deierlein G. (2017). "Space and time interaction modeling of earthquake rupture occurrence". In 12th International Conference on Structural Safety & Reliability, Vienna, Austria.

[C14] **Ceferino L.**, Kiremidjian A., and Deierlein G. (2017). "Framework of the estimation of the health status of the population during an earthquake emergency". In 16th World Conference on Earthquake Engineering, Santiago de Chile, Chile.

[C15] Markhvida M., **Ceferino L.**, and Baker J. (2017). "Effect of ground motion correlation on regional seismic loss estimation: application to Lima, Peru using a cross-correlated principal component analysis model". In 12th International Conference on Structural Safety & Reliability, Vienna, Austria.

[C16] Zavala C., Gibu P., Lavado L., Taira J., Cardenas L., and **Ceferino L.** (2013). "Low Ductility Concrete Wall Test Considering Perpendicular Wall Action". In 10th International Conference on Urban Earthquake Engineering, Center for Urban Earthquake Engineering, Tokyo Institute of Technology, pp.599-602, 2013.

TEACHING AND ADVISING

- Undergraduate and graduate-level courses at the New York University: CE-UY 2133 Engineering Mechanics (undergraduate level); CE-UY 3133 Structural Analysis (undergraduate level); CUSP-GX 8006 Disaster Risk Analysis and Urban Systems Resilience (graduate level).
- 2 Postdoc; 3 Ph.D. students; 2 visiting Ph.D. students; 20 M.S. students (in 6-month-long capstone projects); 7 undergraduate students (in summer research internships).
- Faculty advisor of the NYU EERI Seismic Design Competition (2021 – Present).

CONSULTING EXPERIENCE AND ENTREPRENEURSHIP

APPLIED TECHNOLOGY COUNCIL   **California, USA**
Earthquake Risk Consultant   2019 – 2020
- Developed a user-friendly software to prioritize retrofit and replacement interventions for schools at the nationwide level using seismic risk analysis. The software was designed for the Kyrgyz Republic in a World Bank project, but its applicability has been extended to other countries. The project was awarded the Award of Merit and the Honor Award for Community and Social Impact by the Structural Engineers Association of Northern California of 2022.

WORLD BANK   **Washington D.C., USA**
Earthquake Risk Consultant   Jan. 2017 – 2019
- Developed the objectives, scope, and description of a seismic risk project for Uzbekistan. This regional-scale project will help identify vulnerable, key infrastructure in the region and develop a retrofit program.

YANAPAY Inc.   **Lima, Peru**
Co-founder/CTO   2017 –2019
- Built start-up focused on raising awareness of earthquake losses, fatalities, and tsunami risk for all residential building owners and tenants in Lima, Peru, using earthquake risk tools, machine learning, and computer visualization (https://pe.yanapayperu.com/). The Ministry of Production of Peru provided $50k to support the project.

RENDEL Inc.   **Lima, Peru**
Co-founder and Structural Engineering Consultant   Jan. 2015 – 2019
- Performed structural analysis and design of anchored walls for slope stability in mines, elevated water reservoirs for multiple residential complexes, and special components for industrial plants.

RIVERA CONSULTING GROUP INC.   **San Francisco, USA**
Staff Structural Engineer   Jun. – Aug. 2014
- Performed structural evaluation and designed retrofitting solution for pre-70s reinforced concrete and wooden buildings.

CESEL Inc.   **Lima, Peru**
Internship   Jan. – Mar. 2011
  - Performed structural analysis for two medium rise reinforced concrete buildings.

ACADEMIC SERVICE AND OUTREACH

JOURNAL REVIEWER
Nature Communications
Earthquake Spectra
Natural Hazards Reviews
Reliability Engineering and System Safety
Journal of Earthquake Engineering
Risk Analysis
Natural Hazards
Computers and Structures
International Journal of Disaster Risk Reduction
Computers and Operations Research
Journal of Disaster Research

SCIENTIFIC CONFERENCE SUPPORT
Co-chaired the mini-symposium "Multi-hazard risk modelling: beyond conventional approaches" at ICASP in Dublin, Ireland
                                                                                     2023
Chaired the session "Addressing the Public Health and Healthcare Impacts of Earthquakes" at NCEE in Salt Lake City
                                                                                     2022
Coordinated and co-moderated two sessions on "Post-Earthquake Response, Emergency Management, And Recovery" and "Risk and Resilience of Distributed Infrastructure and Lifelines" at NCEE in Los Angeles   2018
Moderated session on "Seismic Analysis" at the ICOSSAR in Vienna, Austria   2017
Fund-raised and co-organized Techsuyo, the annual meeting for the Peruvian professional community in USA in the areas of science, technology, and innovation, at Stanford University   2017

COMMUNITY AND PROFESSIONAL OUTREACH
Led a workshop with multiple stakeholders of the FloodNet Initiative, including researchers, emergency responders, and city officers, to define priority areas to deploy 500 sensors for inland floods in NYC   2022
Developed material and taught a three-session interactive lecture on earthquake fundamentals at the Sequoia High School in Redwood City, California   2017
Conducted a community session on earthquake vulnerability of soft-story houses for critical neighborhoods in Oakland, California, in coordination with the Oakland Chief Resilience Officer   2015

LEADERSHIP POSITIONS

Co-chair of the Public Health Working Group from the EERI Learning from Earthquake's Program
                                                                                     2022-Present
President, Peruvian Student Association, Stanford University   2016-2018
Board Member, EERI Student Chapter, Stanford University   2016
Vice-President, Peruvian Student Association, Stanford University   2015

Student Representative, Board of the Civil Engineering Department, Universidad Nacional de Ingeniería in Peru
2009 – 2010

INVITED TALKS AND MEDIA COVERAGE

"Multi-hazards Risks of Large-scale Hospital and Power Systems" at Rice University   Nov. 2023

"Multi-hazards Risks of Large-scale Hospital and Power Systems" at Columbia University   Oct. 2023

"Multi-hazards Risks of Large-scale Hospital and Power Systems" at Pontificia Universidad Católica de Chile, Santiago de Chile, Chile   Jun. 2023

"Collapses of infrastructure in New York City" (Interview 1, 2, and 3) at CBS News   May. 2023

"Multi-hazards Risks of Large-scale Hospital and Power Systems" at New Jersey Institute of Technology
May. 2023

"Multi-hazards Risks of Large-scale Hospital and Power Systems" at University of California, Berkeley
Mar. 2023

"Multi-hazards Risks of Large-scale Hospital and Power Systems" at Stony Brook University   Nov. 2022

"Multi-hazards Risks of Large-scale Hospital and Power Systems" at the Blume Center and SURI Affiliates and Alumni Meeting 2022 at Stanford University   Oct. 2022

"Community Resilience through Microgrids and Solar Generation to Earthquakes and Hurricanes" at the ASCE Lifelines Conference 2021-2022 (link to video)   Feb. 2022

"Earthquake Resilience of Hospital Systems" & "Modern Power System's Resilience" at University College of London
Nov. 2021

Participation at the United Nations COP26 in Scotland as part of the NYU Official Delegation   Nov. 2021

"Approaches to manage flood risks after Hurricane Ida" in an interview with News 12 Brooklyn   Sep. 2021

"Effective Policies for Hospital Systems during a Hospital Emergency Response", at UCLA's Graduate Seminar, EERI Annual Meeting and JHU's Healthcare Modeling Workshop   Feb-April. 2021

"Hospitals can coordinate to save lives after an earthquake" in Temblor Inc.'s articles   Nov. 2020

"Resilience of Distributed Energy Resources to Earthquakes and Hurricanes", at UCL, UK.   Nov. 2020

"Disaster Resilience of Hospital Systems and Modern Power Systems", at University of Delaware, University of Washington, New York University, and Johns Hopkins University.   Nov. 2019 – Mar. 2020

"A new technique predicts how quakes would affect a city's hospitals" in Stanford Engineering News
Oct. 2020

"Effective Policies for Hospital System Emergency Response", at University of Delaware & Princeton University.
May. 2019

"Seismic Resilience of Urban Systems to Earthquakes", at Universidad Nacional de Ingeniería in Lima, Peru.
Dec. 2018

"Probabilistic Modeling and Parameter Estimation for Earthquake Ruptures with Application to the Subduction Zone in Peru", at the Instituto Geofísico del Perú, Lima.   Aug. 2018

"Risk Analysis beyond Insurance. Where the Disaster Risk Technologies are Taking us?" at the Understanding Risk Forum organized by the World Bank in Mexico City, Mexico.   Jun. 2018

Featured in the CEO Update Newsletter of the Canterbury District Health Board for research on "Seismic Resilience of Hospital Systems" in New Zealand   Sep. 2017

"April 16, 2016 Mw 7.8 Ecuador Earthquake" at Pacific Earthquake Engineering Research Center at University of California, Berkeley   Jul. 2016

Interviewed by Radio San Borja, in Lima, about seismic risk analysis and performance-based earthquake engineering.
Dec. 2014

Interviewed by the Peruvian Association of Civil Engineers about state-of-the-art research on earthquake engineering in USA.
Aug. 2014

"Experiences about the admission process at North American Universities" at the National University of Engineering in Lima, Peru.
Mar. 2013; Aug., Dec 2014

LANGUAGES

Spanish (native language)

English (second language)