

## LUIS CEFERINO

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### PROFESSIONAL ASSOCIATIONS

#### NEW YORK UNIVERSITY

Assistant Professor  
Civil and Urban Engineering Department  
Center for Urban Science and Progress

**New York, USA**  
2021 – Present

#### PRINCETON UNIVERSITY

Distinguished Postdoctoral Fellow at Andlinger Center for Energy and the Environment &  
Civil and Environmental Engineering Department  
*Advisor:* Ning Lin

**New Jersey, USA**  
2019 – 2020

### EDUCATION

#### STANFORD UNIVERSITY

PhD Civil and Environmental Engineering  
*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

**California, USA**  
2015 – 2019

#### STANFORD UNIVERSITY

MS Structural Engineering and Geomechanics

**California, USA**  
2013 – 2014

#### UNIVERSIDAD NACIONAL DE INGENIERÍA

Bachelor of Science in Civil Engineering  
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”  
*Advisor:* C. Zavala

**Lima, Peru**  
2007 – 2011

### 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

- 2<sup>nd</sup> place in contest of undergraduate research presentations in National Congress of Civil Engineering Students (CONEIC) in Peru 2013
- 1<sup>st</sup> 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] Liu, C., Macedo, J., Kottke, A., **Ceferino, L.** (In Review). 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*
- [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] Avraam, C., **Ceferino, L.**, Dvorkin, Y. (Accepted). Operational and Economy-Wide Impacts of Compound Cyberattacks and Extreme Weather Events on Electric Power Networks. *Applied Energy*. Preprint: <https://arxiv.org/abs/2209.04927>
- [J4] **Ceferino, L.**, & Lin, N. (2023). Hurricane Risk of Solar Generation in the United States. *ASCE Natural Hazards Review*. 24 (4), 04023029:1-12.
- [J5] 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.
- [J6] **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).
- [J7] Alisjahbana, I., **Ceferino, L.**, Kiremidjian, A. (2022). Prioritized Reconstruction of Healthcare Facilities after Earthquakes based on Recovery of Emergency Services. *Risk Analysis*, 14076.
- [J8] 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*.
- [J9] 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.
- [J10] **Ceferino, L.**, Lin, N. & Xi, D. (2022) Stochastic modeling of solar irradiance during hurricanes. *Stochastic Environmental Research and Risk Assessment*, 36, 2681–2693.
- [J11] **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.
- [J12] 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.
- [J13] **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.
- [J14] **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.
- [J15] **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).
- [J16] **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.

- [J17] 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.
- [J18] 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.
- [J19] Lallemand 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).
- [J20] 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 11<sup>th</sup> 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 16<sup>th</sup> 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 12<sup>th</sup> 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 16<sup>th</sup> 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 12<sup>th</sup> 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 3133 Structural Analysis (undergraduate level); CUSP-GX 8006 Disaster Risk Analysis and Urban Systems Resilience (graduate level).
- 2 Postdoc; 2 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 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)