

CURRICULUM VITAE

Shiling Pei, Ph.D., P.E. (CA)

Associate Professor
Department of Civil and Environmental Engineering
Colorado School of Mines
Golden CO 80403
Phone: (303) 273-3932
Fax: (303) 273-3413
Email: spei@Mines.edu

Biographical Summary

Dr. Shiling Pei received his Ph.D. in Civil Engineering from Colorado State University in December 2007 and joined the faculty of Civil and Environmental Engineering at Colorado School of Mines in Fall 2013. Before that, he worked as an Assistant Professor at South Dakota State University from 2010 to 2013. His research focused on traditional and innovative timber systems, multi-hazard mitigation through performance based engineering, numerical modeling of structural dynamic behavior, and large-scale dynamic testing. Dr. Pei received the 2012 ASCE Raymond C. Reese Research Prize for his work on seismic performance of mid-rise wood frame building. He is the author of the Seismic Analysis Package for Woodframe Structures (SAPWood) as part of the NSF (NEESR) funded NEESWood project, and served as one of the lead researchers in shake table testing of a full-scale 7-story wood-steel hybrid building at Japan's E-defense shake table. Dr. Pei is an expert on wood building performance in post-hazard reconnaissance studies, including the 2011 Tuscaloosa and Joplin tornados and 2018 Hurricane Irma. He is currently leading an NSF funded six-university collaborative research project to introduce resilient tall cross laminated timber (CLT) buildings to the U.S., aiming at testing a 10-story full-scale wood building at NHERI@UCSD shake table. Dr. Pei currently serves as the Chair of the ASCE Wood Technical Administrative Committee overseeing four wood engineering related committees. He also serves as Associate Editor for ASCE Journal of Structural Engineering in the field of wood engineering. He is a registered Professional Engineer (Civil) in the State of California.

Educational preparation

- Ph.D., Civil Engineering, Colorado State University, December, 2007.
- B.S., Civil Engineering, Southwest Jiaotong University, China, June, 2000.

Research Fields of Interest

- Performance-based engineering
- Traditional and innovative wood systems
- Large scale dynamic testing
- Mechanistic models and non-linear structural dynamics
- Earthquake engineering and loss analysis

Honors and Awards

- Raymond C. Reese Research Prize, ASCE, 2012.
- Humanitarian Engineering Award from Colorado School of Mines CECS Trade Fair, 2017 (for advising a winning undergraduate student project team).

- TRB Truck and Bus Safety Committee (ANB70) Deborah Freund Paper Award (Co-authored paper).
- Outstanding Reviewer for ASCE Journal of Structural Engineering, 2012.
- Outstanding Reviewer for ASCE Journal of Structural Engineering, 2014.
- EXCEED (Excellence in Civil Engineering Education) Teaching Fellowship, ASCE, 2012.
- Jack E. Cermak Wind Engineering Scholarship. Colorado State University, 2005.
- Mao Yi-Sheng Award for outstanding graduating student. Railroad Transportation Department of China, 2000.

Appointments

- Associate Professor, Colorado School of Mines (May 2018~ Present)
- Assistant Professor, Colorado School of Mines (June 2013~ April 2018)
- Assistant Professor, South Dakota State University (August 2010~ May 2013)
- Post Doctoral Research Associate, Colorado State University (January 2008~ August 2010)
- Instructor, Colorado State University (June 2007~ August 2007)
- Graduate Research Assistant, Colorado State University (August 2004~December 2007)
- Graduate Research Assistant, Michigan Technological University (August 2003~ June 2004, transferred to Colorado State University with advisor)

Teaching Experience

Two new course development after joining CSM (CEEN546 CEEN433/533)

- *CEEN 546 Reliability and Statistical Methods for Engineering Design (CSM)*
- *CEEN 598 Independent Study-Civil Eng (CSM)*
- *CEEN 443 Design of Steel Structures (CSM)*
- *CEEN 440/542 Timber and Masonry Design (CSM)*
- *CEEN 433/533 Matrix Structural Analysis (CSM)*
- *EM210 Mechanics of Materials (SDSU)*
- *CEE 455 Steel Design (SDSU)*
- *CEE 754 Advanced Steel Design (SDSU)*
- *CEE 454/554 Design of Timber Structures (SDSU)*
- *CEE 452/552 Prestressed Concrete (SDSU)*
- *CEE 443/543 Matrix Structural Analysis (SDSU)*
- *CIVE 261 Engineering Mechanics – Dynamics (CSU)*

Professional Activities/Memberships

- Chair of ASCE Wood Technical Administrative Committee (2015~Present)
- Member of ASCE Multi-Hazard Mitigation Committee. (2011~ 2017)
- Member of ASCE Committee on Wood Education (2017~ Present)
- Member of ASCE Committee on Design of Wood Structures. (2011~ 2015)
- Chaired multiple sessions in domestic and international conferences, including ASCE Structures Congress and World Conference on Timber Engineering.
- Keynote presentation on mass timber buildings at the 62nd Annual Structural Engineering Conference at University of Kansas, Lawrence, KS (March 2017)
- Invited presentation on Shake table test of mass timber buildings at multiple

International universities and research institutes (Forest Products Laboratory, U.S.A., Kyoto University, Japan, Southwest Jiaotong University, China), 2018.

- Invited presentation on Mass Timber System and Tall Wood Construction at multiple Chinese universities and research institutes (Hohai University, Nanjing Technological University, Southwest Forestry University, Southwest Jiaotong University), 2017.
- Invited presentation on Sustainable Timber Construction against Natural Hazards at multiple Chinese universities and research institutes (Chengdu University of Technology, Chang'an University, Xi'an University of Architecture and Technology, Xi'an Geological Survey), 2013.
- Invited presentation on the Seismological Society of American annual meeting, synthetic ground motion verification session, April 2012, San Diego CA.
- Invited Speaker for *Woodworks* Workshop: "Trends in Wood Design: Expanding the Possibilities for Wood Buildings" September 2011, Chicago. Topic on performance based seismic design for mid-rise wood buildings.
- Member of the ASCE 2011 Joplin Missouri Tornado Damage Assessment Team
- Invited speaker at the AF&PA Industry Workshop on *Nonlinear time history analysis of woodframe structures*. Boise, ID. Jun 11-12. 2008
- Technical Scribe for the *Research Needs in Wood Engineering* Workshop at 2008 Structures Congress, Natural Hazards Breakout Group, Vancouver, BC. Apr 24-26, 2008.
- Registered Professional Engineer, CA. License No. 76897
- Member, American Society of Civil Engineers N0.490527(ASCE)

Advisees

- Ph.D. Students advised
 1. Peng Deng, Ph.D. May 2017
Thesis subject: Quantitative approaches to assess ground motion impacts in performance based seismic engineering
Support: NSF, USGS
Current employment: Post-Doc
Faculty Role: Advisor
 2. Vahab Bolvardi, Ph.D. Spring 2018
Thesis subject: Displacement based design for inter-story isolated tall CLT buildings
Support: NSF
Current employment: Caltran
Faculty Role: Advisor
 3. Da Huang, Ph.D. Spring 2021 (Expected)
Thesis subject: Resilience-based design methodology for tall wood buildings in regions with high seismicity.

Support: NSF
Current employment: TBD
Faculty Role: Advisor

4. Sandeep, Singh, Ph.D. Spring 2021 (Expected)
Thesis subject: Functional Reliability of Tunnels and Its Impact on Transportation Network Resilience.
Support: U.S. DOT (through UTC at Mines)
Current employment: TBD
Faculty Role: Co-Advisor

- M.S. Students advised (including students at SDSU)

1. Robbie Riveurink, M.S., May 2011. SDSU
Thesis Title “Performance of Light-Frame Gable End Walls under Wind Loads”
Support: Self-Supported
Current employment: City of Sioux Falls
Faculty Role: Advisor
2. Jordan Paul M.S., December 2012. SDSU
Thesis subject: Seismic performance of Cross Laminated Timber building
Support: USDA (Subcontract from Colorado State University)
Current employment: AMEC, MN
Faculty Role: Advisor
3. Mason Underberg M.S., December 2012.
Thesis subject: Behavior of steel open-web Joist assemblies
Support: Nucor Co.
Current employment: Kiewit
Faculty Role: Co-Advisor
4. Brittney Ahrenstoff M.S., May 2014.
Thesis subject: Ice load monitoring for river bridges in South Dakota
Support: MPC (Mountain Plain Consortium) and South Dakota-DOT
Current employment: Kiewit
Faculty Role: Advisor
5. Todd Pauly M.S., May 2014.
Thesis subject: Evaluation and Mitigation of Vehicle Impact Hazards for Overpasses
Support: MPC (Mountain Plain Consortium) and SD-DOT
Current employment: Kiewit
Faculty Role: Co-Advisor

6. Misty McMullen M.S., December 2013.
Thesis subject: Implementation Guidance for Accelerated Bridge Construction in South Dakota
Support: MPC (Mountain Plain Consortium) and SD-DOT
Current employment: Pretressed Systems
Faculty Role: Advisor
7. Conor Lenon, M.S. December 2015
Thesis subject: Design and performance of panelized tall CLT buildings in high seismic regions
Support: Department TA and Start-up
Current employment: Start up design company in Denver
Faculty Role: Advisor
8. Brad Burbach, M.S. December 2016
Thesis subject: Cost competitiveness of CLT in residential single family applications
Support: Department TA and Start-up
Current employment: KLAA, design company in Golden
Faculty Role: Advisor
9. Steven Kordziel, M.S. May 2018
Thesis subject: Moisture monitoring and performance of multi-story mass timber buildings in the U.S.
Support: Department U.S. Forest Services
Current employment: Kiweit, Denver office
Faculty Role: Advisor
10. Henry Crofoot, M.S. Spring 2018
Thesis subject: A performance-based framework for combat protective reinforcement assessment
Support: Self-support (Army support)
Current employment: Army
Faculty Role: Advisor
11. Wangzhou Wen, M.S. Spring 2018
Thesis subject: Study on rebar splice strength using different connection details
Support: Self-support
Current employment: Tianjing City Design Institute
Faculty Role: Co-Advisor
12. Daniel Griesenauer, M.S. Fall 2019 (Expected)
Thesis subject: Full-scale shake table testing of a resilient two-story mass timber building

Support: US Forestry Endowments, NSF

Current employment: TBD

Faculty Role: Advisor

- Undergraduate research student advised (only at CSM)
 1. Kenneth Sullivan (2016) “Fire performance of cross laminated timber panels under bending” funded through Forest Endowment grant
 2. McKauly Malone (2016) “Moisture monitoring for mass timber building projects” funded through US Forest Service grant
 3. Ashton Krajnovich (2016) “Optical tracking displacement measurement for shake table tests” funded through CSM Undergrad Research Fellowship/NSF
 4. Claire van de Yacht (2015) “Mass timber education and research outreach” funded through NSF project undergraduate budget
 5. Urey Chan (2014) “Reusable collapse testing specimen for the CSM earthquake shake table” funded through Start-up and student work study fund
 6. Isabel Goni-McAteer (2014) REU for NSF project: Quantification of Structural Aleatoric Uncertainty for Performance Based Earthquake Engineering
 7. Ali Massoud Khavari (2014) “Energy analysis of tall cross laminated timber building using Open-Studio” funded through CSM Undergrad Research Fellowship/Start-up (Collaborating with Dr. Paulo Tabares, CSM)
 8. Jeryl D. Sandoval (2014) “Self-strengthening nail connections: Bacteria infected nail for roof construction” funded through CSM Undergrad Research Fellowship/Start-up (Collaborating with Dr. John Spear, CSM)
 9. Jonathan Knudtsen (2013) “Scaled shaking table test of a 12-story tall CLT building” funded through CSM Undergrad Research Fellowship/Start-up (Collaborating with Dr. John van de Lindt, Colorado State U)
 10. Kyle A. Hampton (2013) “Numerical modeling of a 12-story tall CLT building under seismic excitation” funded through CSM Undergrad Research Fellowship/Start-up (Collaborating with Dr. Jenő Balogh, Metro-State U)
- Visiting scholars hosted at CSM
 1. Zhibin Jin, Associate Professor, Southwest Jiaotong University, 2013~2014
 2. Dejun Liu, Lecturer, Southwest Jiaotong University, 2013~2014
 3. Xin Wei, Associate Professor, Southwest Jiaotong University, 2014~2015
 4. Shun Liu, Lecturer, Xian Petroleum University, 2014~2015
 5. Qinghua, Zhang, Associate Professor, Southwest Jiaotong University, 2015~2016
 6. Yong Zeng, Associate Professor, Southwest Jiaotong University, 2016~2017

Peer-reviewed Journal Publications

Student Advisees and Visiting Scholars identified with underlines

1. Bolvardi V., Pei S., van de Lindt J.W., and Dolan J.D. “Direct Displacement Design of Tall Cross Laminated Timber Platform Buildings with Inter-Story Isolation”

- Engineering Structures, Accepted.
2. Ganey, Ryan, Jeffrey Berman, Tugce Akbas, Sara Loftus, J. Daniel Dolan, Richard Sause, James Ricles, **Shiling Pei**, John van de Lindt, and Hans-Erik Blomgren. "Experimental Investigation of Self-Centering Cross-Laminated Timber Walls." *Journal of Structural Engineering* 143, no. 10 (2017): 04017135.
 3. Akbas, Tugce, Richard Sause, James M. Ricles, Ryan Ganey, Jeffrey Berman, Sarah Loftus, J. Daniel Dolan, **Shiling Pei**, John W. van de Lindt, and Hans-Erik Blomgren. "Analytical and Experimental Lateral-Load Response of Self-Centering Posttensioned CLT Walls." *Journal of Structural Engineering* 143, no. 6 (2017): 04017019.
 4. Brad Burbach and **Pei S.** (2017) "Cross Laminated Timber for Single Family Residential Construction: A Comparative Cost Study" *Journal of Architectural Engineering*, Accepted in Press.
 5. **Pei S.**, Lenon C., Kingsley G., and Deng P. (2017) "Seismic Design of Cross Laminated Timber Platform Buildings using Coupled Shearwall Concept" *ASCE Journal of Architectural Engineering*, Accepted In Press.
 6. Deng P., **Pei S.**, van de Lindt J.W., and Zhang C. (2017) "An approach to quantify ground motion uncertainty for elastoplastic system acceleration in incremental dynamic analysis." *Advances in Structural Engineering*, Accepted In Press.
 7. Deng P., **Pei S.**, van de Lindt J.W., and Zhang C. (2017) "Uncertainty quantification for bilinear SDOF system seismic responses: A semi-closed-form estimation." *Soil Dynamics and Earthquake Engineering*, Accepted In Press.
 8. Zhang Q., **Pei S.**, Zhenyu Cheng, Yi Bao, and Qiao Li. "Theoretical and Experimental Studies of the Internal Force Transfer Mechanism of Perfobond Rib Shear Connector Group." *Journal of Bridge Engineering* (2016): 04016112.
 9. Jin, Z., **Pei S.**, X. Li, H. Liu, and S. Qiang. "Effect of vertical ground motion on earthquake-induced derailment of railway vehicles over simply-supported bridges." *Journal of Sound and Vibration* 383 (2016): 277-294.
 10. Wei W., Lin X., and **Pei S.** (2015) Shear behavior of multi-hole perfobond connectors in steel-concrete structure. *Structural Engineering and Mechanics*. V56(6), pg 983-1001.
 11. Khavari, A. M., **Pei S.**, and Tabares-Velasco P.C. "Energy Consumption Analysis of Multistory Cross-Laminated Timber Residential Buildings: A Comparative Study." *Journal of Architectural Engineering* 22, no. 2 (2016): 04016002.
 12. Jin Z., **Pei S.**, X. Li, and S. Qiang. (2015) Probabilistic evaluation approach for nonlinear vehicle-bridge dynamic performances. *Journal of Sound and Vibration*, Volume 339, Pages 143-156.
 13. Jin, Z., **Pei, S.**, Li, X., and Qiang, S. (2015). Vehicle-Induced Lateral Vibration of Railway Bridges: An Analytical-Solution Approach. *Journal of Bridge Eng.*, 10.1061/(ASCE)BE.1943-5592.0000784 , 04015038.
 14. Jin, Z., **Pei S.**, Wei X., Liu H., and S. Qiang. "Partially earth-anchored cable bridge: Ultralong-span system suitable for carbon-fiber-reinforced plastic cables." *Journal of Bridge Engineering* 21, no. 6 (2016): 06016003.

15. Lu, P., **Pei S.**, and D. Tolliver. "Regression Model Evaluation for Highway Bridges Component Deterioration Using National Bridge Inventory Data." *Journal of the Transportation Research Forum* 55 (1), (2016).
16. Qin X., Shen Z., Wehbe N., **Pei S.**, and He Z. (2014) Evaluation of Truck Impact Hazards for Interstate Overpasses. *Transportation research record journal of the transportation research board* 2402(-1):1-8 · November 2014
17. **Pei, S.**, J. W. Van De Lindt, M. Popovski, J. W. Berman, J. D. Dolan, J. Ricles, R. Sause, H. Blomgren, and D. R. Rammer. "Cross-Laminated Timber for Seismic Regions: Progress and Challenges for Research and Implementation." *Journal of Structural Engineering* (2014): E2514001.
18. Li X., Liu Q., **Pei S.**, Song L., and Zhang X. "Structure-borne noise of railway composite bridge: numerical simulation and experimental validation." *Journal of Sound and Vibration* 353 (2015): 378-394.
19. Jin, Z., **Pei S.**, Qiang S. "Study on derailment of railway vehicles on bridges during earthquakes based on IDA analysis." Source: Tumu Gongcheng Xuebao/China Civil Engineering Journal, v 47, p 234-239, November 1, 2014 Language: Chinese.
20. **Pei S.**, van de Lindt J.W., Hartzell S., and Luco N. "Variability in Wood-Frame Building Damage using Broad-Band Synthetic Ground Motions: A Comparative Numerical Study with Recorded Motions." *Journal of Earthquake Engineering* 18, no. 3 (2014): 389-406.
21. J.W. van de Lindt, D.V. Rosowsky, W. Pang, and **Pei S.** (2013) "Performance-based seismic design of midrise woodframe buildings" *Journal of Structural Engineering*, 139(8): 1294-1302
22. **Pei S.**, M. Popovski, and J.W. van de Lindt (2013) "Analytical study on seismic force modification factors for cross laminated timber buildings for NBCC" *Canadian Journal of Civil Engineering*, 40(9): 887-896.
23. **Pei S.**, J.W. van de Lindt, and M. Popovski (2013) "Approximate R-Factor for Cross Laminated Timber Walls in Multi-story Buildings" *Journal of Architectural Engineering*, 19(4): 245-255.
24. G. Black, R.A. Davidson, **Pei S.**, and J.W. van de Lindt (2010) "Empirical loss analysis in support definition of seismic performance objectives for woodframe buildings" *Structural Safety*. 32(3): 209-219.
25. K. Luckasiri, T. H. Miller, R. Gupta, **Pei S.**, J.W. van de Lindt "Implementation of Plan Irregularity Rapid Visual Screening Tool for Wood-Frame, Single-Family Dwellings" *Journal of Earthquake Engineering*, 17(4): 497-516
26. **Pei S.** , J.W. van de Lindt , N. Wehbe , and H. Liu (2013) "Experimental study of collapse limits for wood frame shear walls" *Journal of Structural Engineering*, 139(9): 1489-1497

27. J.W. van de Lindt, **Pei S.**, T. Dao, A. Graettinger, D.O. Prevatt, R. Gupta, and W. Coulbourne (2013) "A Dual-objective-based tornado design philosophy" *Journal of Structural Engineering*, 139(2): 251-263
28. David O. Prevatt, John W. van de Lindt, Edward Back, Andrew J. Graettinger, **Pei S.**, William Coulbourne, Rakesh Gupta, Darryl James, and Duzghun Agdas (2012) "Making the case for improved structural design: Tornado outbreaks of 2011" *Leadership and Management in Engineering*, 12(4): 254-270.
29. K. Lucksiri, T. H. Miller, R. Gupta, **Pei S.**, J.W. van de Lindt (2012) "Effect of Plan Configuration on Seismic Performance of Single-Story, Wood-Frame Dwellings" *Natural Hazard Review*, 13(1): 24-33.
30. C. Ni, **Pei S.**, J.W. van de Lindt, S. Kuan, and M. Popovski (2012) "Non-Linear Time-History Analysis of Six-Story Wood Platform Frame Buildings in Vancouver, B.C." *Earthquake Spectra*, 28(2), 621-637.
31. K. Lucksiri, T. H. Miller, R. Gupta, **Pei S.**, J.W. van de Lindt (2012) "A procedure for rapid visual screening for seismic safety of wood-frame dwellings with plan irregularity" *Engineering Structures*, 36, 351-359.
32. J.W. van de Lindt, **Pei S.**, W.C. Pang, and M. Hassansadeh (2012) "Collapse testing and analysis of a light-frame wood garage wall" *Journal of Structural Engineering*, 138(4): 492-501.
33. **Pei S.** and J.W. van de Lindt. (2011) "Seismic Numerical modeling of a six-story light-frame wood building: Comparison with experiments" *Journal of Earthquake Engineering*, 15(6): 924-941.
34. J.W. van de Lindt, **Pei S.**, S.E. Pryor, H. Shimizu, and H. Isoda. (2010) "Experimental seismic response of a full-scale six-story light-frame wood building" *ASCE Journal of Structural Engineering*, 136(10): 1262-1272.
35. **Pei S.**, J.W. van de Lindt, and C.Ni. (2010) "Experimental seismic behavior of a five-story double-midply wood shear wall in a full scale building", *Canadian Journal of Civil Engineering*. 37(9): 1261-1269.
36. J.W. van de Lindt, S.E. Pryor, and **Pei S.** (2010) "Shake table testing of a full-scale seven-story steel-wood apartment building" *Engineering Structures*, 33(3): 757-766.
37. J.W. van de Lindt, R. Gupta, **Pei S.**, K. Tachibana, Y. Araki, and D. Rammer (2012) "Damage Assessment of a Full-Scale, Six-Story, Wood-frame Building Following Tri-Axial Shake Table Tests" *ASCE Journal of Performance of Constructed Facilities*, 26(1): 17-25.
38. **Pei S.** and J.W. van de Lindt. (2010) "Influence of structural properties and hazard level on seismic loss estimation for light-frame wood structures", *Engineering Structures*. 32(8): 2183-2191.
39. G. Black, R.A. Davidson, **Pei S.**, and J.W. van de Lindt (2010) "Empirical loss analysis to support definition of seismic performance objectives for woodframe buildings", *Structural Safety*, 32: 209-219.

40. J.W. van de Lindt, **Pei S.**, W.C. Pang, and D.V. Rosowsky (2010) “IDA comparison of an IBC-designed and DDD six-story light-frame wood building” *ASCE Journal of Performance of Constructed Facilities* (technical note), 25(2): 138-142.
41. J.W. van de Lindt, **Pei S.**, H. Liu, and A. Filiatrault. (2010) “Three-Dimensional Seismic Response of a Full-Scale Light-Frame Wood Building: Numerical Study”, *ASCE Journal of Structural Engineering*. 136(1): 56-65.
42. **Pei S.** and J.W. van de Lindt. (2009). “Coupled shear-bending formulation for seismic analysis of stacked wood shear wall systems” *Earthquake Eng. and Structural Dynamics*, 38 (14): 1631-1647.
43. W. Pang, D.V. Rosowsky, **Pei S.**, and J.W. van de Lindt. (2010) “Simplified Direct Displacement Design of Six-story Woodframe Building and Pretest Seismic Performance Assessment.” *ASCE Journal of Structural Engineering*. 136(7): 813-825.
44. **Pei S.** and J.W. van de Lindt. (2009) “Systematic seismic design for manageable loss in woodframe buildings”, *Earthquake Spectra*, 25(4), 851-868.
45. **Pei S.**, and J.W. van de Lindt. (2009). “Methodology for earthquake-induced loss estimation: An application to woodframe buildings.” *Structural Safety*, 31(1), 31-42.
46. J.W. van de Lindt, **Pei S.**, and H. Liu (2008). “Performance-Based Seismic Design of Wood Frame Buildings using a Probabilistic System Identification Concept” *ASCE Journal of Structural Engineering*, 134(2), 240-247.
47. W. Pang, D.V. Rosowsky, **Pei S.**, and J.W. van de Lindt (2007). “Evolutionary parameter hysteretic model for wood shear walls” *ASCE Journal of Structural Engineering*, 133(8), 1118-1129.
48. J.W. van de Lindt, H. Liu, and **Pei S.** (2007). “Performance of a woodframe structure during full-scale shake table tests: Drift, damage, and effect of partition wall” *ASCE Journal of Performance of Constructed Facilities*, 21(1), 35-43.
49. J.W. van de Lindt and **Pei S.**. (2006). “Buckling Reliability of Deteriorating Steel Beam Ends.” *Electronic Journal of Structural Engineering*, Vol 6, 1-7.

Journal Publications under Review

1. Yie H. et al. “Fatigue performance analysis of damaged steel beams strengthened with prestressed unbonded CFRP plates” Submitted to *Journal of Bridge Engineering*.
2. Jin Z., **Pei S.**, and Blomgren H. “Simplified Mechanistic Model for Seismic Response Prediction of Coupled Cross Laminated Timber Rocking Walls” Submitted to *ASCE Journal of Structural Engineering*.
3. **Pei S.** et al. “Experimental seismic response of a resilient two-story mass timber building with post-tensioned rocking walls” Submitted to *ASCE Journal of Structural Engineering*.

Conference Proceedings and Presentations

1. **Pei S.** et al. “Wood Rocks: How did a resilient mass timber building survive 27 earthquakes” the 3rd International Mass Timber Conference, Portland OR, 2018

2. Pei S. et al. "Full-scale shake table test of a two-story mass timber building with resilient rocking wall systems" ASCE Structures Congress, Fort Worth TX, 2018.
3. Pei S. "How to do thirty-four shake table tests in one summer" Invited presentation at UC San Diego's NSF NHERI site user training workshop, December 2017.
4. Shiling Pei, John van de Lindt, Jeff Berman, Andre Barbosa, Eric McDonnell, Reid Zimmerman, Hans-Erik Blomgren, James Dolan, and Douglas Rammer "Full-Scale Shake Table Test of A Two-Story Mass-Timber Building With Resilient Rocking Walls" 16th European Conference on Earthquake Engineering, 2018
5. S. Pei , J.W. van de Lindt , A.R. Barbosa , H.-E. Blomgren , J. Berman , J.D. Dolan , E. McDonnell , R.B. Zimmerman "FULL-SCALE SHAKE TABLE TESTING OF A TWO-STORY MASS-TIMBER ROCKING WALL BUILDING" 11th U.S. National Conference on Earthquake Engineering, Los Angeles CA, 2018
6. Pei S. "A Brief Introduction to NHERI TallWood Project" IUFRO Division 5 Conference, Vancouver Canada, 2017
7. Pei S. et al. "Development and full-scale validation of resilience-based seismic design of tall wood buildings: the NHERI Tallwood Project" 2017 NZSEE conference, Christchurch NZ.
8. **Pei S.** , Rammer D., Popovski M., Williamson T., Line P., van de Lindt J.W. (2016) "An Overview of CLT Research and Implementation in North America" 2016 World Conference on Timber Engineering, Vienna Austria
9. **Pei S.**, Khavari A., Tabares-Velasco P.C., Zhao S. (2016) "Comparative energy consumption study on tall cross laminated timber building for U.S. climates" 2016 World Conference on Timber Engineering, Vienna Austria
10. Bolvardi V. , **Pei S.**, John W. van de Lindt , James D. Dolan (2016) "Direct Displacement Design of Tall CLT Building with Deformable Diaphragms" 2016 World Conference on Timber Engineering, Vienna Austria
11. Amini M.O., van de Lindt J.W., Rammer D., **Pei S.**, Line P., Popovski M. (2016) "determination of seismic performance factors for CLT shearwall systems" 2016 World Conference on Timber Engineering, Vienna Austria
12. Deng P., **Pei S.**, van de Lindt J.W., Liu H., and Zhang C.(2016) "An approach to quantify ground motion uncertainty through incremental dynamic analysis" 2016 Engineering Mechanics Institute Annual Conference, Nashville TN.
13. Jin Z., Li X., **Pei S.** (2015) "Derailment of railway vehicles on simply-supported bridges subjected to lateral and vertical ground motions. The 2nd international symposium on life-cycle performance of bridges and structures." December 18-20, 2015, Chiangsha, China.
14. Qin X., Sen Z., Wehbe N., **Pei S.**, and He Z. (2014) "Evaluation of Truck Impact Hazards for Interstate Overpasses" Transportation Research Board meeting, Washington D.C. (TRB Truck and Bus Safety Committee (ANB70) Deborah Freund Paper Award)

15. Lu P., **Pei S.**, Tolliver D., and Jin Z. (2015) “Data-based Evaluation of Regression Models for Bridge Component Deterioration” Transportation Research Board Annual Conference, Washington D.C.
16. **Pei S.**, J. Berman, J. Dolan, J. van de Lindt, J. Ricles, R. Sause, H. Blomgren, M. Popovski, and D. Rammer (2014) “Progress on the development of seismic resilient tall CLT buildings in the Pacific Northwest” World Conference on Timber Engineering 2014, Quebec, Canada
17. Jin Z., X. Li, D. Liu, and **Pei S.** (2014) “An Efficient Numerical Method for the Vehicle-bridge Nonlinear Dynamic Interaction” EUROLYN 2014: IX International Conference on Structural Dynamics, Porto, Portugal
18. J.D. Dolan, V. Bordry, **Pei S.**, and J.W. van de Lindt (2014) “Tall Cross Laminated Timber Building: Design and Performance” ASCE Structures Congress 2014, Boston MA.
19. **Pei S.**, W Pang, and H. Liu (2013) “Evaluation of Cross Laminated Timber building performance for hurricane and earthquake hazards” Engineering Mechanics Institute Conference, Evanston, IL.
20. S. Zhao, H. Liu, Q. Su, and **Pei S.** (2013) “Seismic analysis of masonry infill buildings based on experimental hysteresis responses” The Seventh International Structural Engineering and Construction Conference, Honolulu HI.
21. **Pei S.**, J.W. van de Lindt, and H. Liu (2013) “Mitigation of content damage for tall cross laminated timber (CLT) buildings during earthquake events” The Seventh International Structural Engineering and Construction Conference, Honolulu HI.
22. **Pei S.**, W Pang, and H. Liu (2013) “Multi-hazard performance-based design of mid-rise wood –frame buildings for hurricanes and earthquakes” 11th International Conference on Structural Safety & Reliability, New York, NY.
23. **Pei S.**, M. Popovski, and J.W. van de Lindt (2012) “Numerical modeling of cross laminated timber construction for performance-based seismic design” 1st international conference on performance-based and life-cycle structural engineering, Hong Kong, China.
24. **Pei S.**, J.D. Dolan, H. Liu, J.W. van de Lindt, and J.M. Ricles (2012) “Introducing hysteretic damping and ductility in multi-story cross laminated timber buildings for improved seismic performance” World Conference on Timber Engineering, Auckland, New Zealand.
25. **Pei S.**, M. Popovski, and J.W. van de Lindt (2012) “Seismic design of a multi-story cross laminated timber building based on component level testing” World Conference on Timber Engineering, Auckland, New Zealand.
26. **Pei S.**, J.W. van de Lindt, S. Hartzell, and N. Luco (2012) “Synthetic and Recorded Ground motion damage potential to light frame wood buildings” Presentation, Seismological Society of America annual meeting, San Diego CA.
27. **Pei S.**, J.W. van de Lindt, N. Wehbe, H. Liu, and J. Paul (2012) “Collapse Limits for

- Wood Frame Shear Walls: An Experimental Investigation” Structures Congress 2012, Chicago.
28. Prevatt D.O., Roueche D.B., van de Lindt J.W., **Pei S.**, Dao T., Coulbourne W., Graettinger A., Gupta R., and Grau D. (2012) “Building Damage Observations and EF Classifications from the Tuscaloosa, AL, and Joplin, MO, Tornadoes” Structures Congress 2012, Chicago.
 29. W.C. Pang, M. Hassansadeh, J.W. van de Lindt, and **Pei S.** (2011) “Structural Collapse Analysis of Light-frame Wood Shear Walls under Earthquake Motions” 8th International Conference on Urban Earthquake Engineering & 5th International Conference on Earthquake Engineering, Tokyo, Japan.
 30. **Pei S.**, J.W. van de Lindt, S. Hartzell, and N. Luco (2011) “Comparison study on damage potential of synthetic and recorded ground motions” 8th International Conference on Urban Earthquake Engineering & 5th International Conference on Earthquake Engineering, Tokyo, Japan.
 31. **Pei S.** and J.W. van de Lindt (2010) “Seismic performance of a six-story woodframe building at Japan’s E-Defense: Experimental and Numerical Assessment” Quake Summit 2010-NEES and PEER Annual Meeting, San Francisco, CA.
 32. J.W. van de Lindt, **Pei S.**, and S.E. Pryor (2010) “Design, Construction, and Shake Table Testing of a Full-Scale Seven-Story Apartment Building” The Fourth International Conference on Structural Engineering, Mechanics and Computation (SEMC), Cape Town, South Africa
 33. J.W. van de Lindt, **Pei S.**, S.E. Pryor, H. Shimizu, K. Tachibana, H. Isoda, and I. Nakamura (2010) “Testing of a Full-Scale Apartment Building at E-Defense: Design and Performance” 7th International Conference on Urban Earthquake Engineering & 5th International Conference on Earthquake Engineering, Tokyo, Japan.
 34. S.E. Pryor, J.W. van de Lindt, and **Pei S.** (2010) “Experimental Seismic Response of A Full-scale Seven-story Mixed-use Steel/Wood Apartment Building” 7th International Conference on Urban Earthquake Engineering & 5th International Conference on Earthquake Engineering, Tokyo, Japan.
 35. W. Pang, D.V. Rosowsky, J.W. van de Lindt, and **Pei S.** (2010) “Simplified performance-based seismic design of NEESWood Capstone Building and pre-test performance evaluation” *9th US national and 10th Canadian conference on earthquake engineering*, Toronto, Canada.
 36. W. Pang, D.V. Rosowsky, J.W. van de Lindt, and **Pei S.** (2010) “Performance-based shear wall design of six-story NEESWood Capstone building via simplified direct displacement design procedure” 2010 Structures Congress, Orlando, Florida.
 37. J.W. van de Lindt, **Pei S.**, S.E. Pryor, H. Shimizu, and I. Nakamura (2010) “Validation of the NEESWood PBSD procedure: Testing of a full-scale six-story building at Japan’s E-defense” 2010 Structures Congress, Orlando, Florida.
 38. J.W. van de Lindt, **Pei S.**, S.E. Pryor, and H. Shimizu (2010) “Shake table testing of a

- full-scale light frame wood apartment building” *9th US national and 10th Canadian conference on earthquake engineering*, Toronto, Canada.
39. J.W. van de Lindt, C. Ni, **Pei S.**, and S. Kuan (2010) “Nonlinear time history analysis and performance of mid-rise light-frame wood buildings in Vancouver, B.C.” *9th US national and 10th Canadian conference on earthquake engineering*, Toronto, Canada.
 40. J.W. van de Lindt, S.E. Pryor, and **Pei S.** (2009) “Shake table testing of a seven-story mixed-use condominium at Japan’s E-Defense” 2009 SEAOC Convention, San Diego, CA.
 41. **Pei S.** and J.W. van de Lindt (2008). “Influence of light-frame wood structure properties on seismic loss estimation”, 14th World Conference on Earthquake Engineering, Beijing, China.
 42. **Pei S.** and J.W. van de Lindt (2008). “Loss-based seismic design for woodframe structures: A fragility based procedure”, 10th World Conference on Timber Engineering, Miyazaki, Japan.
 43. W. Pang, D.V. Rosowsky, J.W. van de Lindt, H. Liu, and **Pei S.** (2008). “Tiered Approach to Performance-Based Seismic Design of Wood Frame Buildings”, 2008 Structures Congress, Vancouver, Canada.
 44. J.W. van de Lindt, H. Liu, and **Pei S.** (2007) “Methodology for performance-based seismic design using probabilistic system identification” *the 10th International Conference on Applications of Statistics and Probability*, Tokyo, Japan. ICASP10 Proceeding: 415-416.
 45. **Pei S.** and J.W. van de Lindt (2007) “Long term seismic loss evaluation for woodframe structures: A performance-based procedure”, *9th Canadian Conference on Earthquake Engineering*, Ottawa, Canada.
 46. **Pei S.** and J.W. van de Lindt. (2007). “Seismic Design of Woodframe Residential Structures for Lifetime Loss Minimization: A Bayesian Approach.” *10th International Conference on Applications of Statistics and Probability in Civil Engineering*, Tokyo, Japan. ICASP10 Proceeding: 375-376.
 47. W. Pang, D.V. Rosowsky, **Pei S.**, and J.W. van de Lindt (2006). “Evolutionary parameter hysteretic model for wood shearwalls”, *9th World Conference on Timber Engineering*, Portland OR, U.S.A.
 48. **Pei S.**, J.W. van de Lindt, D.V. Rosowsky, and W. Pang (2006). “Next generation hysteretic models for development of a performance-based seismic design philosophy for woodframe construction”, *8th National Conference on Earthquake Engineering*, San Francisco CA.

Book Chapters

1. J.W. van de Lindt D. Rammer, M. Popovski, P. Line, **Pei S.**, and S.E. Pryor “CLT Handbook: Chapter 4, Lateral Design of Cross Laminated Timber Buildings” FPIInnovations, ISSN 1925-0495; SP-529E
2. J.W. van de Lindt and **Pei S.** “Reliability Engineering Advances: Seismic Reliability

of Nonlinear Structural Systems”, Nova Science Publishers, ISBN: 978-1-60692-329-0.

3. J.W. van de Lindt and **Pei S.** “Progress in the Performance-based Seismic Design of Wood Structures”, Saxe-Coburg publisher.

Journal Reviewer

Earthquake Engineering and Engineering Vibration

Journal of Structural Engineering

Engineering Structures

Earthquake Spectra

European Journal of Environmental and Civil Engineering

Journal of Earthquake Engineering

Journal of Bridge Engineering

Journal of Performance of Constructed Facilities

Natural Hazards

Journal of Cultural Heritage

Construction and Building Materials

Software and Dataset Development

1. Seismic Analysis Package for Woodframe Structures (SAPWood) version 2.0, released in August, 2010. Available for free at www.NEES.org
2. Seismic Analysis Package for Woodframe Structures (SAPWood) version 1.0, released in December, 2007.
3. Kijewski-Correa, Tracy; Roueche, David; Pinelli, Jean-Paul; Prevatt, David; Zisis, Ioannis; Gurley, Kurtis; Refan, Maryam; Haan, Jr., Frederick; Pei, Shiling; Rasouli, Ashkan; Elawady, Amal; Rhode-Barbarigos, Landolf; (2017), "RAPID: A Coordinated Structural Engineering Response to Hurricane Irma (in Florida)" , DesignSafe-CI [publisher], Dataset, doi:10.17603/DS2TX0C

Technical Reports and Other Publications

1. Deng P., **Pei S.**, Hartzell S., Luco N., and Rezaeian S. (2017) “Calibrating Synthetic Ground Motions Damage Potential through Broadband Spectral Inversion” USGS research report
2. **Pei S.**, N. Wehbe, and B. Ahrenstorff (2015) “Evaluation of Ice Loads on Bridge Structures in South Dakota” Research report, South Dakota DOT.
3. M. Tracy, **Pei S.**, and N. Wehbe (2014) “Implementation Guidance for Accelerated Bridge Construction in South Dakota” Research report, South Dakota DOT.
4. **Pei S.**, N. Wehbe, and H. Liu (2013) “Performance, cost effectiveness, and selection criteria for short span concrete structures in South Dakota” Research report, South Dakota DOT.
5. D.O. Prevatt, J.W. van de Lindt, A. Graettinger, W. Coulbourne, R. Gupta, **Pei S.**, S. Hensen, and D. Grau (2011) “Damage study and future direction for structural design following the Tuscaloosa Tornado of 2011” Research report, NSF.

6. D.O. Prevatt, W. Coulbourne, A. Graettinger, **Pei S.**, R. Gupta, and D. Grau (2011) “The Joplin Tornado of 2011-Damage survey and case for tornado-resilient codes” Research report, ASCE.
7. **Pei S.**, J.W. van de Lindt, S. Hartzell, and N. Luco (2010) “Developing damage potential indicators from structural characteristics for improvement in synthetic ground motion generation: Collaborative research with Colorado State University and USGS” Colorado State University, Fort Collins, CO.
8. J.W. van de Lindt, **Pei S.**, D. Rammer, M. Popovski, and P. Line (2012) “Cross Laminated Timber Handbook, Chapter 4: Lateral design of cross laminated timber buildings” Under review.
9. **Pei S.**, J.W. van de Lindt, S.E. Pryor, H. Shimizu, and H. Isoda (2010) “Seismic testing of a full-scale six-story light-frame wood building: NEESWood Capstone test”, NEESWood Report NW-04.
10. W. Pang, D.V. Rosowsky, J.W. van de Lindt, and **Pei S.** (2009) “Simplified Direct Displacement Design of Six-story NEESWood Capstone Building and Pre-Test Seismic Performance Assessment”, NEESWood Report NW-05.
11. **Pei S.** and J.W. van de Lindt (2007). “SAPWood User's Manual”, Released with SAPWood program as part of the NEESWood project.
12. **Pei S.** (2007). “Loss analysis and loss based seismic design for woodframe structures”, Ph.D. Dissertation, December 2007, Colorado State University, 243 pages.
13. G. Fu, J.W. van de Lindt, **Pei S.**, R.M. Pablo Jr., and S. Buddhawanna (2006). “LRFD Load Calibration for State of Michigan Trunkline Bridges”, Report RC-1466.

Research Activities

Received funding from various sources including NSF, USDA, USGS, State DOT, non-profit organization, and institution internal funding. By May 2018, received \$1.49 million external funding as lead PI or Sole PI at CSM. Total career funding about \$2 million for all participated (including Co-PI) projects.

1. PI: “Seismic Design Provisions and Commentary for Post-Tensioned Mass Timber Walls” Funded by US Forest Service Wood Innovations Fund, \$250,000, 2018~2020
2. PI: “Development of a Mold-Risk Model for Wood Buildings” Funded by US Endowment for Forestry and Communities, \$100,000, 2016~2018
3. PI: “Differences in Fire Risk with Different Adhesives in Cross Laminated Timber” Funded by US Endowment for Forestry and Communities, \$150,000, 2017~2019
4. Lead PI: “Collaborative Research: Development and Validation of A Resilience-based Seismic Design Methodology for Tall Wood Buildings” Six-university collaborative project Funded by NSF, Total \$1,500,000 (CSM portion \$390,000), 2016~2020
5. PI: “Expanding Cross Laminated Timber Market through Building Moisture Monitoring and Improved Modeling” Funded by US Forest Service Wood

Innovations Fund, \$250,000, 2016~2019

6. PI: USGS External research grant, “Calibrating synthetic ground motions damage potential through broadband spectral inversion: Collaborative research with Colorado School of Mines, and the USGS” Funded by USGS, \$70,000, 2015~2016
7. Lead PI, “NEESR Planning: Resilient Timber Options for Tall Buildings” Five-university collaborative project Funded by NSF, Total \$400,000 (CSM portion \$113,000), 2013~2015
8. PI, “Quantification of Structural Aleatoric Uncertainty for Performance Based Earthquake Engineering” Funded by NSF, \$307,000, 2013~2016
9. PI, “Travel grant to solicit research collaboration with China on seismic timber engineering” Open research fund: Key Laboratory of Seismic Technology of Sichuan Province, Southwest Jiaotong University, \$2,500 cover travel only, 2013
10. Senior Personnel, “Evaluation and Mitigation of Vehicle Impact Hazards for Overpasses” Funded by South Dakota Department of Transportation and Mountain Plains Consortium, 2013
11. PI, “Accelerated bridge construction in South Dakota: A feasibility study” Funded by South Dakota Department of Transportation and Mountain Plains Consortium. \$60,000, 2012~2013
12. PI (Sub-Award), “Development of the Cross Laminated Timber Bio-product for Wood Building Construction in Seismic Regions” Funded by U.S. Forest Service through Sub contract from University of Alabama. \$50,000, 2010~2013
13. Co-PI, “RAPID: Collection of Perishable Data on Wood-Frame Building Failure Mechanisms During the 2011 Tuscaloosa Alabama Tornado” Funded by National Science Foundation and International Association for Wind Engineering. \$18,484
14. Team member, “Assessment of Tornado Induced Damage During the 2011 Joplin Missouri Tornado” Funded by American Society of Civil Engineers, Travel support only.
15. Invited participant of “US-Vietnam Workshop on Multiple Natural Hazards Assessment and Mitigation under the Impact of Climate Change” funded by NSF Office of International Science and Engineering, Travel support only.
16. Leading the SDSU-UA-RPI team for blind prediction of the NEES: TIPS test for base-isolated steel moment frame building at E-Defense Japan. No Funding.
17. PI, “Assessing the stability of wood frame walls under extreme snow loads” Funded by South Dakota State University Research Scholarship Support Fund, \$6,000, 2011.
18. Principal Investigator, “Effect of window panel assembly on residential building strength and performance” Funded by South Dakota State University Enhancing Scholarly Excellence Fund \$5,000, 2010
19. PI, “Evaluation of ice loads on bridge piers in South Dakota” funded by South Dakota Department of Transportation and Mountain Plain Consortium. \$171,000, 2011~2013

20. Co-PI, “Evaluation of cost effectiveness, performance, and selection criteria for concrete structures” funded by South Dakota Department of Transportation and Mountain Plain Consortium. \$75,000, 2010~2011
21. Post-Doc Researcher, “Developing Damage Potential Indicators through Coupling Intrinsic Mode Functions and Structural Characteristics for Improvement in Synthetic Ground Motion Generation: Collaborative Research with Colorado State University and USGS”, U.S. Geological Survey, December 2008-December 2009.
22. Post-Doc Researcher, “Seismic Analysis and Fragility Development for Multi-Story Wood-frame Buildings in British Columbia”, British Columbia Ministry of Housing and Social Development, September 2008-september 2009.
23. Post-Doc Researcher, “NEESWood: Development of a Performance-Based Seismic Design Philosophy for Mid-Rise Woodframe Construction”, National Science Foundation, 2005-2009.
24. Ph.D. Candidate, “Reliability-Based Shearwall Design for Multiple Performance Objectives”, U.S. Department of Agriculture, 2004-2008.
25. Ph.D. Candidate, Designed and helped build uni-axial shake table test facility at Colorado State University’s Engineering research Center. Managed all shake table tests conducted at Colorado State University.
26. Ph.D. Candidate, “LRFD Load Calibration for State of Michigan Trunkline Bridges”, Michigan Department of Transportation, 2003-2004.
27. Ph.D. Candidate, “Full-scaled load test of steel nodes of space trusses for Chongqing City Stadium”, Southwest Jiaotong University, Chengdu, China, 2003.
28. Ph.D. Candidate, “Dynamic vibration monitoring and test for high speed railway bridges”, Railroad Transportation Department of China, 2002-2003.