Jian Li, Ph.D., P.E.

Chair's Council Assistant Professor

Department of Civil, Environmental and Architectural
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EDUCATION

Ph.D. in Civil Engineering   May 2013
University of Illinois at Urbana-Champaign, Urbana, IL
Dissertation Title: Monitoring, modeling and hybrid simulation – an integrated Bayesian-based approach
to high-fidelity fragility analysis
Advisor: Billie F. Spencer, Jr.

M.S. in Civil Engineering   July 2007
Harbin Institute of Technology, Harbin, China
Advisor: Jinping Ou

B.S. in Civil Engineering   July 2005
Harbin Institute of Technology, Harbin, China

PROFESSIONAL EXPERIENCE

Chair's Council Assistant Professor   August 2018 – present
Assistant Professor   August 2013 – present
The University of Kansas, Lawrence, KS
Department of Civil, Environmental & Architectural Engineering
Director of Smart Structures and Earthquake Engineering (SSEE) Group
- Conduct research on structural health monitoring using advanced sensing techniques such as large-size skin sensor network and computer vision, data assimilation for structural condition prognosis through linear and nonlinear filtering, and sensor data fusion.
- Lead several federal and state research projects addressing challenges facing the aging civil infrastructure.
- Teach graduate and undergraduate courses in Civil Engineering.

Graduate Research Assistant   August 2007 – May 2013
University of Illinois at Urbana-Champaign, Urbana, IL
Department of Civil and Environmental Engineering
Smart Structures Technology Laboratory (SSTL)
Prof. Billie F. Spencer, Jr.
- Conducted research in structural health monitoring and earthquake engineering.
- Created an integrated seismic impact assessment framework and software package that include monitoring, system identification and model updating, substructure hybrid simulation, fragility analysis, and seismic impact assessment.
- Developed an advanced time synchronization strategy to achieve high data synchronization accuracy for wireless sensing under severe nonlinear clock drift due to the environmental impact.
- Designed and implemented an autonomous operational strategy and software module for long-term large-scale multi-objective wireless structural health monitoring.
- Proposed and investigated a new formulation and methodology for substructure hybrid simulation under differential ground motions.

- Created a novel output decoupling strategy for system identification of complex civil structures subject to multiple inputs.

RESEARCH INTERESTS

- Infrastructure health monitoring and risk assessment
- System identification, model updating and uncertainty quantification
- Computer vision and innovative sensing techniques
- Fatigue crack and multiscale structural damage monitoring
- Wireless smart sensor networks
- Substructure hybrid simulation
- Earthquake impact assessment and mitigation

HONORS AND AWARDS

1. Tier 1 SEI Young Professional Scholarship, Structural Engineering Institute, American Society of Civil Engineers   2019
2. Chair's Council Professorship, Department of Civil, Environmental and Architectural Engineering, The University of Kansas   2018
3. NSF Travel Award to participate in the 2017 NSF Aspiring CPS PIs Workshop, National Science Foundation   2018
4. NSF Travel Award to participate in the 2018 Natural Hazards Engineering Research Infrastructure (NHERI) Summer Institute, National Science Foundation   2018
5. Takuji Kobori Prize, International Association of Structural Control and Monitoring (IASCM)   2017
6. ASCE ExCEEd Fellow, American Society of Civil Engineers   2015
7. Best Practices Institute Fellow, Center for Teaching Excellence, University of Kansas   2014
8. APSS Fellowship, University of Illinois/National Science Foundation   2010
9. Outstanding Graduate Awards, Harbin Institute of Technology   2007
10. Outstanding Graduate Awards, Harbin Institute of Technology   2005
11. Outstanding Graduate Award, China Civil Engineering Society   2005

PROFESSIONAL ENGINEER (P.E.) LICENSURE

State of Kansas   License No. 25703   June 2017 – present

JOURNAL PUBLICATIONS

(Names of advised and co-advised graduate students are underscored)

1. Wu, Y., Wang, H., Li, J., Sha, B., and Li, A. (2019) "Inelastic Displacement Spectra for Seismically Isolated Bridges Subjected to Near-fault Pulse-like Ground Motions." *Earthquake Spectra*, EERI. (Accepted)

2. Kong, X. and Li, J. (2019) "Non-contact fatigue crack detection in civil infrastructure through image overlapping and crack breathing sensing." *Automation in Construction,* 99: 125-139.

3. Wang, H., Zhu, Q., Li, J., Mao, J., Hu, S., and Zhao, X. (2019) "Identification of Moving Train Loads on Railway Bridge Based on Strain Monitoring." *Smart Structures and Systems*. (Accepted)

4. Kong, X., Li, J., Bennett, C., Collins, W., Laflamme, S., and Jo, H. (2019). "Thin-film Sensor for Fatigue Crack Sensing and Monitoring in Steel Bridges under Varying Crack Propagation Rate and Random Traffic Load." *ASCE Journal of Aerospace Engineering*, 32(1): 04018116.

5. Jeong, J., Xu, J., Jo, H., Li, J., Kong, X., Collins, W., Bennett, C., Laflamme, S. (2018). "Development of Wireless Sensor Node Hardware for Large-area Capacitive Strain Monitoring." *Smart Materials and Structures*, 28(1): 015002.

6. Mao, J., Wang, H., and Li, J. (2019). "Fatigue Reliability Assessment of a Long-Span Cable-Stayed Bridge Based on One-Year Monitoring Strain Data: Case Study." *ASCE Journal of Bridge Engineering*, 24(1): 05018015.

7. Asadollahi, P., Huang, Y., and Li, J. (2018). "Bayesian model updating and assessment of cable-stayed bridges using long-term monitoring data." *Sensors*, 18(9), 3057.

8. Kong, X., Li, J., Collins, W., Bennett, C., Laflamme, S., and Jo, H. (2018). "Sensing Distortion-induced Fatigue Cracks in Steel Bridges with Capacitive Skin Sensor Arrays." *Smart Materials and Structures*, 27(11), 13pp.

9. Kong, X. and Li, J. (2018). "Image Registration-Based Bolt Loosening Detection of Steel Joints." *Sensors*, 18(4), 20pp.

10. Kong, X. and Li, J. (2018). "Vision-based Fatigue Crack Detection of Steel Structures Using Video Feature Tracking." *Computer-Aided Civil and Infrastructure Engineering*, Wiley, 33(9), 783-799.

11. Nguyen, K., Nasouri, R., Bennett, C., Matamoros, A., Li, J., and Montoya, A. (2018). "Thermomechanical Modeling of Welding and Galvanizing of a Steel Beam Connection Detail to Examine Susceptibility to Cracking." *Materials Performance and Characterization*, ASTM, 7(2), 26pp.

12. Liu, H., Zhou, J., Bun, S., Simmons, G., Bennett, C.R., Matamoros, A., and Li, J. (2017). "Effectiveness of Crack-Arrest Holes under Distortion-Induced Fatigue Loading." *ASCE Journal of Bridge Engineering*, 23(2), 04017141

13. Kong, X., Li, J., Collins, W., Bennett, C., Laflamme, S., and Jo, H. (2017). "A Large-area Strain Sensing Technology for Monitoring Fatigue Cracks in Steel Bridges." *Smart Materials and Structures*, 26, 12pp.

14. Asadollahi, P. and Li, J. (2017). "Statistical Analysis of Modal Properties of a Cable-stayed Bridge through Long-term Wireless Structural Health Monitoring." *ASCE Journal of Bridge Engineering*, 22(9), 04017051.

15. Kong, X., Li, J., Bennett, C., Collins, W., and Laflamme, S. (2016). "Numerical Simulation and Experimental Validation of a Large Area Capacitive Strain Sensor for Fatigue Crack Monitoring." *Measurement Science and Technology*, 27(12), 10pp.

16. Kim, R.E., Li, J., Spencer Jr., B.F, Nagayama, T., and Mechitov, K.A. (2016). "Synchronized Sensing for Wireless Monitoring of Large Structures." *Smart Structures and Systems*, 18(5), 885-909.

17. Li, J., Mechitov, K.A., Kim, R.E., and Spencer Jr., B.F. (2016). "Efficient Time Synchronization for Structural Health Monitoring using Wireless Smart Sensor Networks." *Journal of Structural Control and Health Monitoring*, 23(3), 470-486. (**Takuji Kobori Prize, IASCM**)

18. Moreu, F., Li, J., Jo, H., Kim, R.E., Scola, S., Spencer Jr., B.F., and LaFave, J.M. (2016). "Reference-free Displacement Estimation for Timber Railroad Bridge Assessment using Wireless Smart Sensors." *ASCE Journal of Bridge Engineering*, 21(2), 04015052.

19. Kharroub, S., Laflamme, S., Song, C., Qiao, D., Phares, B., and Li, J. (2015). "Smart Sensing Skin for Detection and Localization of Fatigue Cracks." *Smart Materials and Structures*, 24, 065004.

20. Wang, H., Li, J., Guo, T., Wang, C., and Li, A. (2015). "Influence of Apparent Wave Velocity on Seismic Performance of a Super-long-span Triple-tower Suspension Bridge." *Advances in Mechanical Engineering*, 7(6), 1-14.

21. Spencer Jr., B., Jo, H., Mechitov, K., Li, J., Sim, S., Kim, R., Cho, S., Linderman, L., Moinzadeh, P., Giles, R., and Agha, G. (2015). "Recent Advances in Wireless Smart Sensors for Multi-scale

Monitoring and Control of Civil Infrastructure." *Journal of Civil Structural Health Monitoring*, 6(1), 17-41.

22. Moreu, F., Jo, H., Li, J., Kim, R., Cho, S., Kimmle, A., Scola, S., Le, H., Spencer Jr., B.F., LaFave, J.M. (2014). "Dynamic assessment of timber railroad bridges using transverse displacements." *ASCE Journal of Bridge Engineering,* 20(10), 04014114.

23. Wang, H., Tao, T., Guo, T., Li, J., and Li, A. (2014). "Full-Scale Measurement and System Identification on Sutong Cable-stayed Bridge during Typhoon Fung-Wong." *The Scientific World Journal*, 2014, 936832, 13pp.

24. Sim, S., Li, J., Jo, H., Park, J., Cho, S., Spencer Jr., B. F., and Jung, H. (2014). "Wireless Smart Sensor Network for Automated Monitoring of Cable Tension." *Smart Materials and Structures*, 23(2), 10pp.

25. Li, J., Ruiz-Sandoval, M., Spencer Jr., B.F., and Elnashai, A.S. (2014). "Parametric Time-domain Identification of Multiple-Input Systems Using Decoupled Output Signals." *Earthquake Engineering and Structural Dynamics*, 43(9), 307-1324.

26. An, Y., Ou, J., Li, J., and Spencer Jr., B. F. (2014). "Stochastic DLV Method for Steel Truss Structures: Simulation and Experiment." *Smart Structures and Systems*, 14(2), 105-128.

27. Wang, H., Li, A., Niu, J., Zong, Z., and Li, J. (2013). "Long-term Monitoring of Wind Characteristics at Sutong Bridge Site." *Journal of Wind Engineering and Industrial Aerodynamics*, 115, 39-47.

28. Li, J., Spencer Jr., B.F., and Elnashai, A.S. (2013). "Bayesian Updating of Fragility Functions using Hybrid Simulation." *ASCE Journal of Structural Engineering*, 139(7), 1160-1171.

29. Jang, S., Li, J., and Spencer Jr., B.F. (2013). "Corrosion Estimation of a Historic Truss Bridge using Model Updating." *ASCE Journal of Bridge Engineering*, 18(7), 678-689.

30. Zhang, Y., Jia, C., Li, J., and Spencer Jr., B.F. (2013). "Model Updating Based on an Affine Scaling Interior Optimization Algorithm." *Engineering Optimization*, 45(11), 1379-1395.

31. Li, J., Spencer Jr., B.F., Elnashai, A.S., and Phillips, B.M. (2012). "Substructure Hybrid Simulation with Multiple-Support Excitation." *ASCE Journal of Engineering Mechanics,* 138(7), 867-876.

32. Lin, S., Li, J., Elnashai, A.S., and Spencer Jr., B.F. (2012). "NEES Integrated Seismic Risk Assessment Framework (NISRAF)." *Soil Dynamics and Earthquake Engineering*, 42, 219-228.

33. Wang, H., Li, A., and Li, J. (2010). "Progressive Finite Element Model Calibration of a Long-span Suspension Bridge Based on Ambient Vibration and Static Measurements." *Engineering Structures*, 32(9), 2546-2556.

34. Wang, H., Li, A., Hu, R., and Li, J. (2010). "Accurate Stress Analysis on Steel Box Girder of Long-span Suspension Bridges Based on Multi-Scale Submodeling Method." *Advances in Structural Engineering*, 13(4), 727-740.

35. Wang, H., Li, A., Zhao, G., and Li, J. (2010). "Non-linear Buffeting Response Analysis of Long-span Suspension Bridges with Central Buckle." *Earthquake Engineering and Engineering Vibration*, 9(2), 259-270.

MANUSCRIPTS IN REVIEW

1. Nguyen, K., Bennett, C., Matamoros, A., Nasouri, R., Li, J., and Montoya, A. "Galvanizing-Induced Distortion in Steel Plate Girders, Part I: Effects of Girder Geometry." *ASCE Journal of Bridge Engineering*. (In revision)

2. Nguyen, K., Bennett, C., Matamoros, A., Nasouri, R., Li, J., and Montoya, A. "Galvanizing-Induced Distortion in Steel Plate Girders, Part II: Effects of Welding and Galvanizing Practices." *ASCE Journal of Bridge Engineering*. (In revision)

3. Wang, H., <u>Zheng, W.</u>, Li, J., and Gao, Y. "Effects of Temperature and Lead Core Heating on Response of Seismically Isolated Bridges Under Near-fault Excitations." *ASCE Journal of Bridge Engineering*. (In revision)

4. <u>Zheng, W.</u>, Wang, H., Li, J., and Shen, H. "Parametric Study of SMA-based Friction Pendulum System for Response Control of Bridges under Near-fault Ground Motions." *Journal of Earthquake Engineering*. (In revision)

CONFERENCE PUBLICATIONS

(Names of advised and co-advised graduate students are underscored)

1. <u>Nasouri, R.</u>, <u>Nguyen, K.</u>, Montoya, A., Matamoros, A., Bennet, C., Li, J., and Kinstler, T. (2018). "Effect of Geometric Configuration on High-Mast Illumination Pole Demands During Galvanizing Process." *The 25th International Galvanizing Conference*, June 17-22, Berlin, Germany.

2. Li, J., <u>Kong, X.</u>, Bennett, C., Collins, W., Jo, H., <u>Jeong, J.</u>, and Laflamme, S. (2018). "Sensing Fatigue Damage in Steel Bridges Using Strain-based Skin Sensor Networks." *The 7th World Conference on Structural Control and Monitoring (7WCSCM)*, July 22-25, Qingdao, China.

3. <u>Nguyen, K.</u>, <u>Nasouri, R.</u>, Bennet, C., Matamoros, A., Li, J., and Montoya, A. (2018). "Distortion of Steel Plate Girders due to Hop-dip Galvanizing." *World Steel Bridge Symposium*, American Institute of Steel Construction, April 11-13, Baltimore, MD.

4. <u>Kong, X.</u> and Li, J. (2018). "Automated Fatigue Crack Identification through Motion Tracking in a Video Stream." *Proc. SPIE Smart Structures/NDE 2018*, Denver, CO.

5. <u>Taher, S.</u>, Li, J., and Fang, H. (2018). "Input and State Estimation for Earthquake-excited Building Structures using Acceleration Measurements." *Proc. SPIE Smart Structures/NDE 2018*, Denver, CO.

6. <u>Kong, X.</u>, Li, J., Collins, W., Bennett, C., Jo, H., <u>Jeong, J.</u>, and Laflamme, S. (2018). "Dense Capacitive Sensor Array for Monitoring Distortion-induced Fatigue Cracks in Steel Bridges." *Proc. SPIE Smart Structures/NDE 2018*, Denver, CO.

7. <u>Jeong, J.</u>, Xu, J., Jo, H., Li, J., <u>Kong, X.</u>, Collins, W., Bennett, C., and Laflamme, S. (2018). "Capacitance-based wireless strain sensor development." *Proc. SPIE Smart Structures/NDE 2018*, Denver, CO.

8. <u>Kong, X.</u> and Li, J. (2018). "An image-based Feature Tracking Approach for Bolt Loosening Detection in Steel Connections." *Proc. SPIE Smart Structures/*NDE *2018*, Denver, CO.

9. <u>Kong, X.</u>, Li, J., Collins, W., Bennett, C., Jo, H., Jeong, J., and Laflamme, S. (2018). "Large-scale Strain-sensing Approach for Detecting Fatigue Cracks in Steel Bridges." *IABMAS 2018*, Melbourne, Australia.

10. <u>Nguyen, K.</u>, <u>Nasouri, R.</u>, Bennett, C., Matamoros, A., Li, J., and Montoya, A. (2017). "Sensitivity of Predicted Temperature in a Fillet Weld T-Joint to Parameters Used in Welding Simulation with Prescribed Temperature Approach." In *Proc. Science in the Age of Experience Conference*, Chicago, IL.

11. <u>Asadollahi P.</u>, Huang, Y., and Li, J. (2017). "Bayesian Model Updating of a Cable-stayed Bridge Considering Modeling Error Using Long-term Monitoring Data." *3rd Huixian International Forum on Earthquake Engineering for Young Researchers*, Champaign-Urbana, IL, August 11-12.

12. <u>Kong, X.</u>, Li, J., Collins, W., Bennett, C., Laflamme, S., and Jo, H. (2017). "A Robust Signal Processing Method for Quantitative High-cycle Fatigue Crack Monitoring Using Soft Elastomeric Capacitor Sensors." *Proc. SPIE Smart Structures/NDE 2017*, Portland, OR.

13. <u>Asadollahi, P.</u>, Li, J., and Yong, H. (2017). "Prediction-error Variance in Bayesian Model Updating: a Comparative Study." *Proc. SPIE Smart Structures/NDE 2017*, Portland, OR.

14. Asadollahi, P. and Li, J. (2016). "Statistical Analysis of Modal Properties of a Cable-stayed Bridge through Long-term Structural Health Monitoring with Wireless Smart Sensor Networks." *Proc. SPIE Smart Structures/NDE 2016*, Las Vegas, NV.

15. Kong, X., Li, J., Bennett, C., Collins, W., and Laflamme, S. (2016). "Model Calibration for a Soft Elastomeric Capacitor Sensor Considering Slippage under Fatigue Cracks." *Proc. SPIE Smart Structures/NDE 2016*, Las Vegas, NV.

16. Wu, J., Yan, Q.S., Li, J., and Hu. M. (2016). "Geometry Control of Long-span Continuous Girder Concrete Bridge during Construction through Finite Element Model Updating." *Proc. SPIE Smart Structures/NDE 2016*, Las Vegas, NV.

17. Sutley, E. J., Fadden, M., and Li, J. (2016). "A Vision for Smart Cities based on Current Research." *In IEEE Smart Cities Workshop*, Kansas City, MO.

18. Laflamme, S., Vens, J., Qiao, D., Downey, A., and Li, J. (2015). "Dense Network of Large Area Electronics for Fatigue Crack Detection and Localization." *10th International Workshop on Structural Health Monitoring*, Stanford, CA.

19. Kong, X., Li, J., Laflamme, S., and Bennett, C. (2015). "Fatigue Crack Monitoring using Large-area, Flexible Capacitive Strain Sensors." *Proc. 6AESE/11ANCRiSST*, Champaign-Urbana, IL.

20. Laflamme, S., Downey, A., Sheafe, C., Qiao, D., and Li, J. (2015). "Scalable Thin Film Sensor for Damage Detection and Localization." *Proc. 6AESE/11ANCRiSST*, Champaign-Urbana, IL.

21. Liu, H., Zhou, J., Bennett, C., Matamoros, A., and Li, J. (2015). "A Parametric Study of Crack-Arrest Holes as a Mitigation Technique for Distortion-induced Fatigue Cracking in Steel Bridges." *Proc. 16th European Bridge Conference*, At Edinburgh, Scotland.

22. McElrath, K., Olson, Z., Bennett, C., Matamoros, A., and Li, J. (2015). "Development and Field Testing of Angles-with-Plate Retrofit Technique for Repairing Distortion-induced Fatigue in Steel Bridges without Deck Removal." *Proc. 16th European Bridge Conference*, At Edinburgh, Scotland.

23. Kong, X., Li, J., Laflamme, S., Bennett, C., and Matamoros, A. (2015). "Characterization of a Soft Elastomeric Capacitive Strain Sensor for Fatigue Crack Monitoring." *Proc. SPIE Smart Structures/NDE 2015,* San Diego, CA.

24. Li, J., Mechitov, K.A., and Spencer Jr., B.F. (2014). "Long-term and Short-term Autonomous Structural Health Monitoring Strategies using Wireless Smart Sensor Networks." *Proc. The Sixth World Conference on Structural Control and Monitoring (6WCSCM)*, Barcelona, Spain.

25. Li, J., Mechitov, K.A., Kim, R., and Spencer Jr., B.F. (2014). "Improved Synchronized Sensing for Structural Health Monitoring using Wireless Smart Sensor Networks." *Proc. The Sixth World Conference on Structural Control and Monitoring (6WCSCM)*, Barcelona, Spain.

26. Li, J., Ruiz-Sandoval, M., Spencer Jr., B.F., and Elnashai, A.S. (2014). "System Identification of Civil Engineering Structures with Multiple Inputs by Decoupling Output Signals." *Proc. SPIE Smart Structures/NDE 2014,* San Diego, CA.

27. Sim, S., Li, J., Jo, H., Park, J., Cho, S., Spencer Jr., B. F., and Yun, C.B. (2013). "Automated Wireless Monitoring System for Cable Tension Using Smart Sensors." *Proc. SPIE Smart Structures/NDE 2013,* San Diego, CA.

28. Moreu, F., Jo, H., Li, J., Cho, S., Kim, R., Spencer Jr., B.F., and LaFave, J.M. (2012). "Reference-free Displacement Estimation for Structural Health Monitoring of Railroads Bridges." *AREMA 2012 Annual Conference*, Chicago, IL.

29. Li, J., Nagayama, T., Mechitov, K.A., and Spencer Jr., B.F. (2012). "Efficient Campaign-type Structural Health Monitoring Using Wireless Smart Sensors." *Proc. SPIE Smart Structures/NDE 2012*, San Diego, CA.

30. Lin, S., Li, J., Elnashai, A.S., and Spencer Jr., B.F. (2012). "NEES Integrated Seismic Risk Assessment Framework (NISRAF)," *Proc. The 2012 NZSEE Annual Conference, the University of Canterbury, Christchurch, New Zealand.*

31. Sim, S., Li, J., Jo, H., Park, J.W., Cho, S.J., and Spencer Jr., B.F. (2011). "Automated Cable Tension Monitoring using Smart Sensors." *Proc. World Congress on Advances in Structural Engineering and Mechanics (ASEM' 11)*, Seoul, Korea.

32. Lin, S., Elnashai, A.S., Li, J., and Spencer Jr., B.F. (2011). "Integrated System for Earthquake Impact Assessment," *III ECCOMAS Thematic Conference on Computational Methods in Structural Dynamics and Earthquake Engineering (COMPDYN 2011)*, M. Papadrakakis, M. Fragiadakis, V. Plevris (eds.) Corfu, Greece, 25-28 May.

33. Sim, S., Li, J., Cho, S.J., Jo, H., Park, J.W., and Spencer Jr., B.F. (2011). "Decentralized In-network Data Processing for Infrastructure Monitoring Using Smart Sensors." *Proc. The 11ᵗʰ Korea-Japan Joint Symposium on Steel Bridges*, Jeju National University, Jeju, Korea.

34. Jo, H., Sim, S., Mechitov, K. A., Kim, R., Li, J., Moinzadeh, P., Spencer Jr., B.F., Park, J.W., Cho, S., Jung, H., Yun, C.B., Rice, J., and Nagayama, T. (2011). "Hybrid Wireless Smart Sensor Network for Full-scale Structural Health Monitoring of a Cable-stayed Bridge." *Proc. SPIE Smart Structures/NDE 2011*, San Diego, CA.

35. Li, J., Spencer Jr., B.F., Elnashai, A.S., and Phillips, B.M. (2010). "Hybrid Simulation with Multiple-Support Excitation." *Proc. The Fifth World Conference on Structural Control and Monitoring (5WCSCM)*, Tokyo, Japan.

36. Jang, S., Rice, J., Li, J., Jo, H., Spencer Jr., B.F. (2009). "Structural Monitoring of a Historic Truss Bridge Using a Wireless Sensor Network." *Proc. 5ᵗʰ International Workshop on Advanced Smart Materials and Smart Structures Technology*, ANCRISST 2009, Boston, MA.

37. Li, J., Lin, S., Zong, X., Spencer Jr., B.F., Elnashai, A.S., and Agrawal, A.K. (2009). "An Integrated Earthquake Impact Assessment Framework." *Proc. Asian-Pacific Network of Centers for Earthquake Engineering Research (ANCER) Workshop*, University of Illinois at Urbana-Champaign, Urbana, IL.

CONFERENCE PAPERS IN REVIEW

1. Asadollahi, P., Li, J., and Huang, Y. (2019). "Stochastic Damage Identification of Cable-stayed Bridge through Sparse Bayesian Learning and Model Reduction." *The 9ᵗʰ International Conference on Structural Health Monitoring of Intelligent Infrastructure (ISHMII-9)*, August 4-7, St. Louis, Missouri.

2. Kong, X., Jeong, J., Asadollahi, P., Fu, Y., Jo, H., Bennett, C., Collins, W., Laflamme, S., and Li, J. (2019). "Wireless Soft Elastomeric Capacitor Sensor Network for Long-term Fatigue Crack Monitoring of Steel Bridges." *The 9ᵗʰ International Conference on Structural Health Monitoring of Intelligent Infrastructure (ISHMII-9)*, August 4-7, St. Louis, Missouri.

3. Almarshad, A., Li, J., and Lepage, A. (2019). "Drift Estimation of Tall Building Structures under Non-stationary Wind Loading through Sensor Data Fusion." *The 9ᵗʰ International Conference on Structural Health Monitoring of Intelligent Infrastructure (ISHMII-9)*, August 4-7, St. Louis, Missouri.

TECHNICAL REPORTS AND OTHER PUBLICATIONS

1. Zhou, J., Bennett, C., Matamoros, A., Li, J., and Rolfe, S. (2016). "Skewed Steel Bridges: Effect of Cross-Frame Layout on Lateral Flange Bending Stresses." *Final Report to the Kansas Department of Transportation*, Project KTRAN KU-13-3. February.

2. Bun, S.H., Bonet, E., Matamoros, A.B., Bennett, C.R., Barrett-Gonzalez, R., Li, J., and Rolfe, S. (2016). "Improving Infrastructure Sustainability 2: Repairing Existing Fatigue Cracks in Steel

Bridges Using Carbon Fiber Reinforced Polymer Materials." *Final Report to the Kansas Department of Transportation*, Project KTRAN KU-11-5. January.

3. Liu, H., Bennett, C.R., Matamoros, A.B., Li, J., Barrett-Gonzalez, R., and Rolfe, S. (2016). "Improving Infrastructure Sustainability 1: Extending Useable Lives of Steel Bridges by Halting Distortion-Induced Fatigue Crack Propagation Using Pretensioned Bolts and Plate Washers." *Final Report to the Kansas Department of Transportation*, Project KTRAN KU-11-3. January.

4. McElrath, K., Matamoros, A.B., Bennett, C.R., Li, J., and Rolfe, S. (2015). "Repair of Distortion-Induced Fatigue Damage in Bridge No. 135-87 (043SB and 044NB) Using Newly-Developed Strengthening Schemes." *Final Report to the Kansas Department of Transportation*, Project C1916. November.

5. Li, J. and Spencer Jr., B.F. (2015). "Monitoring, Modeling, and Hybrid Simulation An Integrated Bayesian-based Approach to High-fidelity Fragility Analysis." *Newmark Structural Engineering Laboratory (NSEL) Report Series*, No. 37, University of Illinois at Urbana-Champaign, Urbana, IL (http://hdl.handle.net/ 2142/78092).

6. Cho, S., Spencer Jr. B.F., Jo, H., Li, J., and Kim, R. (2012). "Bridge Monitoring using Wireless Smart Sensors." *SPIE Newsroom*. doi: 10.1117/2.1201201.004043.

7. Miller, T., Spencer Jr., B.F., Li, J., and Jo, H. (2010). "Solar Energy Harvesting and Software Enhancements for Autonomous Wireless Smart Sensor Networks." *Newmark Structural Engineering Laboratory (NSEL) Report Series*, No. 22, University of Illinois at Urbana-Champaign, Urbana, IL

PATENTS

(Names of advised and co-advised graduate students are underscored)

1. Li, J., 50%; and Kong, X., 50%. (2018). "Fatigue Crack Detection Using Feature Tracking." International Patent Application, U.S. Patent and Trademark Office. Application No.: PCT/US2018/063264, filed [November 30, 2018].

2. Kong, X., 60%; and Li, J., 40%. (2018). "Fatigue Crack Detection in Civil Infrastructure." Provisional Patent, U.S. Patent and Trademark Office. Serial No.: 62/720,339, filed [August 21, 2018].

3. Kong, X., 60%; and Li, J., 40%. (2018). "Vision Based Fastener Detection." Provisional Patent, U.S. Patent and Trademark Office. Serial No.: 62/647,136, filed [March 23, 2018].

4. Li, J., 50%; and Kong, X., 50%. (2017). "Vision-based Fatigue Crack Detection Using Feature Tracking." Provisional Patent, U.S. Patent and Trademark Office. Serial No.: 62/592,771, filed [November 30, 2017].

RESEARCH GRANTS

External Grants:

1. TPF-5(328): Strain-based Fatigue Crack Monitoring of Steel Bridges using Wireless Elastomeric Skin Sensors
PI with Co-PIs: Bennett and Collins
FHWA Transportation Pooled Fund Program (Participating DOTs: KS, IA, MN, NC, OK, PA, TX)
$405,000, 09/01/2015 – 08/31/2018

2. NCHRP 10-94: Mitigation of Weldment Cracking of Highway Steel Structures due to the Galvanizing Process
PI with Co-PI: Bennett & Rolfe.
National Academy of Science
$499,974.75, 07/01/2014 – 5/30/2019

3. Analytical Investigation of Saddle Connections for Overhead Sign Trusses with Respect to Strength and Fatigue Performance
   PI with Co-PIs: Collins, Bennett & Sutley
   Kansas Department of Transportation
   $47,405, 07/01/2017 – 06/30/2019

4. Reducing Bridge Inspection Risks through Automated Inspection Performed Using Digital Image Correlation Techniques
   Co-PI with PI: Collins, and Co-PIs: Bennett, Fadden & Sutley
   Mid-American Transportation Center, University of Nebraska-Lincoln
   $400,000, 8/1/2017 – 7/31/2022

5. Evaluation of StopCrackEX Technology for Treating Crack-Arrest Holes under Distortion-Induced Fatigue.
   Co-PI with PI: Bennett, and Co-PI: Collins
   Kansas Department of Transportation
   $82,276, 06/01/2018 –12/31/2020

6. Dynamic Performance of Cantilevered Sign Trusses for Fatigue
   Co-PI with PI: Bennett, and Co-PIs: Collins & Ewing
   Kansas Department of Transportation
   $63,355, 09/01/2017 – 08/31/2019

7. Determination of Fatigue Resistance of Coupler Connection in Aluminum Overhead Truss Sign Supports
   Co-PI with PI: Bennett, and Co-PIs: Collins & Sutley
   Kansas Department of Transportation
   $144,846, 01/01/2016 – 03/31/2019

8. Repair of Distortion-Induced Fatigue Damage in Bridge No. 135-87 (043SB and 044NB) Using Newly-Developed Strengthening Schemes
   PI (*assumed PI role since 12/2014*), with Co-PIs: Bennett & Rolfe
   Kansas Department of Transportation
   $122,222, 11/01/2011 – 08/31/2015

Internal Grants:

1. TRESTLE Course Transformation Grant for CE 461 Structural Analysis
   Co-PI with PI: Sutley
   Center for Teaching Excellence, University of Kansas
   $2,994, 05/02/2018 – 05/01/2019

2. Wireless Fatigue Crack Monitoring for Steel Bridges using Soft Elastomeric Capacitors
   PI, General Research Fund, University of Kansas
   $5,200, 07/2015 – 07/2016

3. Base-station-free Wireless Smart Sensor Networks for Autonomous Monitoring of Civil Infrastructure
   PI, New Faculty General Research Fund, University of Kansas
   $8,000, 07/2014 – 07/2015

INVITED SEMINARS & PRESENTATIONS

1. *East China Jiaotong University*, Nanchang, China, *Host: Professor Jinhua Li*, "Multi-scale Data-rich Environment for Modeling and Probabilistic Risk Assessment of Civil Infrastructure." August 6, 2018.

2. *Nanchang University*, Nanchang, China, *Host: Professor Shujun Hu*, "Multi-scale Data-rich Environment for Modeling and Probabilistic Risk Assessment of Civil Infrastructure." August 3, 2018.

3. *Dalian University of Technology*, Dalian, China, *Host: Professor Zhen He*, "Multi-scale Data-rich Environment for Modeling and Probabilistic Risk Assessment of Civil Infrastructure." July 29, 2018.

4. *Southeast University*, Nanjing, China, *Host: Professor Hao Wang*, "Multi-scale Data-rich Environment for Modeling and Probabilistic Risk Assessment of Civil Infrastructure." July 27, 2018.

5. *The Seventh World Conference on Structural Control and Monitoring (7WCSCM)*, Qingdao, China, "Sensing Fatigue Damage in Steel Bridges Using Strain-based Skin Sensor Networks." July 23, 2018.

6. *Iowa State University*, Ames, Iowa, *Host: Professor Simon Laflamme*, "Multi-scale Data-rich Environment for Modeling and Probabilistic Risk Assessment of Civil Infrastructure." December 9, 2017.

7. *Dalian University of Technology*, Dalian, China, *Host: Professor Zhen He*, "Monitoring, modeling, and hybrid simulation – an integrated Bayesian-based approach to high-fidelity fragility analysis." August 4, 2016.

8. *Harbin Institute of Technology* (Shenzhen), Shenzhen, China, *Host: Professor Jinping Ou*, "Monitoring, modeling, and hybrid simulation – an integrated Bayesian-based approach to high-fidelity fragility analysis." July 29, 2016.

9. *South China University of Technology*, Guangzhou, China, *Host: Professor Quansheng Yan*, "Monitoring, modeling, and hybrid simulation – an integrated Bayesian-based approach to high-fidelity fragility analysis." July 27, 2016.

10. *Beijing University of Civil Engineering and Architecture*, Beijing, China, *Host: Professor Chiyu Jiao*, "Monitoring, modeling, and hybrid simulation – an integrated Bayesian-based approach to high-fidelity fragility analysis*."* July 24, 2016.

11. *Southeast University*, Nanjing, China, *Host: Professor Hao Wang*, "Monitoring, modeling, and hybrid simulation – an integrated Bayesian-based approach to high-fidelity fragility analysis." July 22, 2016.

12. *The Cambridge Conference on WSN for Civil Engineering and Infrastructure Monitoring*, Cambridge, United Kingdom, *Host: Professor Kenichi Soga*, "Fatigue Crack Monitoring of Steel Bridges using Wireless Soft Elastomeric Capacitor Sensor Networks." June 30, 2015.

13. *University of Kansas Professional Development Series*, Kansas City, Missouri, "Bridge Inspection for the 21st Century." April 7, 2014.

CONFERENCE AND WORKSHOP PRESENTATIONS

1. *Engineering Mechanics Institute Conference 2018*, Cambridge, MA, "Dense capacitive sensor arrays for monitoring distortion-induced fatigue cracks in steel bridges." June 1, 2018.

2. *SPIE Smart Structures/NDE 2018*, Denver, CO, "Input and State Estimation for Earthquake-excited Building Structures using Acceleration Measurements." March 7, 2018.

3. *SPIE Smart Structures/NDE 2018*, Denver, CO, "Automated Fatigue Crack Identification through Motion Tracking in a Video Stream." March 6, 2018.

4. *The Third Huixian International Forum on Earthquake Engineering for Young Researchers*, Champaign-Urbana, IL, "Bayesian Model Updating of a Cable-stayed Bridge Considering Modeling Error Using Long-term Monitoring Data." August 12, 2018.

5. *Engineering Mechanics Institute Conference (EMI 2017)*, San Diego, CA, "A large-area strain sensing technology for monitoring high-cycle fatigue cracks in steel bridges." June 7, 2017.

6. *SPIE Smart Structures/NDE 2017*, Portland, OR, "Prediction-error Variance in Bayesian Model Updating: a Comparative Study." *Poster presentation*, March 27, 2017.

7. *The 43rd Conference on Quantitative Nondestructive Evaluation (QNDE)*, Atlanta, GA, "Fatigue Crack Monitoring under High-cycle Fatigue Loading using Large-area Soft Elastomeric Capacitive Sensor." July 19, 2016.

8. *Engineering Mechanics Institute Conference (EMI 2016) and the Probabilistic Mechanics & Reliability Conference (PMC 2016)*, Vanderbilt University, Nashville, TN, "System Identification and Bayesian Model Updating of a Cable-Stayed Bridge through Long-Term Structural Health Monitoring Using Wireless Smart Sensor Networks." May 25, 2016.

9. *Bridge DAWG Forum on bridge performance data analysis, the 95th Annual Meeting of the Transportation Research Board*, Washington, DC, "Statistical Analysis of Modal Properties of a Cable-stayed Bridge through Long-term Wireless Structural Health Monitoring." January 9, 2016.

10. *SPIE Smart Structures/NDE*, San Diego, CA, "Characterization of a Soft Elastomeric Capacitive Strain Sensor for Fatigue Crack Monitoring." *Poster presentation*, March 10, 2015.

11. *The Sixth World Conference on Structural Control and Monitoring (6WCSCM)*, Barcelona, Spain, "Long-term and Short-term Autonomous Structural Health Monitoring Strategies using Wireless Smart Sensor Networks." July 15, 2014.

12. *The Sixth World Conference on Structural Control and Monitoring (6WCSCM), Barcelona*, Spain, "Improved Synchronized Sensing for Structural Health Monitoring using Wireless Smart Sensor Networks." July 15, 2014.

13. *SPIE Smart Structures/NDE 2014*, San Diego, CA, "System Identification of Civil Engineering Structures with Multiple Inputs by Decoupling Output Signals." March 11, 2014.

14. *The Tenth EKS (Elnashai-Kuchma-Spencer) retreat*, Robert Allerton Park, Monticello, IL, "Improved Synchronized Sensing for Structural Health Monitoring using Wireless Smart Sensor Networks." February 1, 2014.

15. *The Ninth EKS retreat*, Robert Allerton Park, Monticello, IL, "Parametric Time-domain Identification of Multiple-input Systems Using Decoupled Output Signals." February 2, 2013.

16. *SPIE Smart Structures/NDE 2012*, San Diego, CA, "Efficient Campaign-type Structural Health Monitoring Using Wireless Smart Sensors." March 13, 2012.

17. *The Eighth EKS (Elnashai-Kuchma-Spencer) retreat*, Robert Allerton Park, Monticello, IL, "Efficient campaign-type structural health monitoring system using wireless smart sensors." February 5, 2012.

18. *The Seventh EKS (Elnashai-Kuchma-Spencer) Retreat*, Robert Allerton Park, Monticello, IL, "NEES Integrated Seismic Risk Assessment Framework - Application to the Meloland Overcrossing Bridge." February 5, 2011. (Best presentation award, third place).

19. *Workshop on Cyber-Physical Co-Design of Wireless Monitoring and Control for Civil Infrastructure*, University of Illinois at Urbana-Champaign, Urbana, IL, "Autonomous Wireless Smart Sensor Network (WSSN) Operation." February 17, 2011.

20. *NSF CMMI Grantee Conference*, Atlanta, GA, "NEES Integrated Seismic Risk Analysis Framework." *Poster Presentation*, January 4-7, 2011.

21. *The Fifth World Conference on Structural Control and Monitoring (5WCSCM)*, Tokyo, Japan, "Hybrid Simulation with Multiple-Support Excitation." July 11, 2010.

22. *The Sixth EKS (Elnashai-Kuchma-Spencer) retreat*, Robert Allerton Park, Monticello, "Hybrid Simulation with Multiple-Support Excitation (MSE)." February 6, 2010.

23. *Asian-Pacific Network of Centers for Earthquake Engineering Research (ANCER) Workshop*, University of Illinois at Urbana-Champaign, Urbana, IL, "An Integrated Earthquake Impact Assessment Framework." August 14, 2009.

24. *The Fifth EKS (Elnashai-Kuchma-Spencer) retreat*, Robert Allerton Park, Monticello, IL, "An Integrated Earthquake Impact Assessment System." February 7, 2009.

25. *The Fourth EKS (Elnashai-Kuchma-Spencer) retreat*, Robert Allerton Park, Monticello, IL, "Framework for Development of Hybrid Simulation in an Earthquake Impact Assessment Context." February 17, 2008.

GRADUATE STUDNETS ADVISED

Ph.D. students currently enrolled:
- Sdiq Taher
  Dissertation Topic: Stochastic Data Assimilation for Reliable Change Characterization and Prognosis of Civil Infrastructure under Uncertainties
- Abdulaziz Almarshad
  Dissertation Topic: Structural health monitoring framework for building structures with data-driven and physics-based strategies

Ph.D. students completed
- Xiangxiong Kong (Ph.D. 2018 with *Honor*)
  Dissertation Title: Monitoring Fatigue Cracks in Steel Bridges using Advanced Structural Health Monitoring Technologies
- Parisa Asadollahi (Ph.D. 2018)
  Dissertation Title: Bayesian-based Finite Element Model Updating, Damage Detection, and Uncertainty Quantification for Cable-stayed Bridges

M.S. students completed
- Sdiq Taher (M.S. 2018 with *Honor*)
  Thesis Title: Input and state estimation for earthquake-excited building structures using acceleration measurements
- Abdulaziz Almarshad (M.S. 2017 with *Honor*)
  Thesis Title: Displacement Estimation of Building Structures Using Acceleration and Strain Measurements

PH.D. DISSERTATION AND M.S THESIS COMMITTEES

Doctoral Committee Member

Ongoing:

Zahra Andalib	PhD in Civil Engineering	Fall 2015 - Present
Eugene Boadi-Danquah	PhD in Civil Engineering	Fall 2015 - Present
Hayder Ibrahim Al-Salih	PhD in Civil Engineering	Summer 2015 - Present
Somayeh Mosleh	PhD in Electrical Engineering	Spring 2015 - Present
Danqing Yu	PhD in Civil Engineering	Fall 2013 - Present
Chenqi Liu	PhD in Civil Engineering	Spring 2012 - Present

Graduated:

Sajed Huq	PhD in Civil Engineering	Fall 2014 - Summer 2018
Kien Nguyen	PhD in Civil Engineering (Honor)	Fall 2014 - Summer 2018
Kathleen S. McElrath	PhD in Civil Engineering	Fall 2012 - Fall 2015
Hao Liu	PhD in Civil Engineering	Fall 2011 - Spring 2015
Alisha Elmore	PhD in Civil Engineering	Spr 2012 - Summer 14

Master's Committee Member

Ongoing:

Duncan Patrick MacLachlan	MS in Civil Engineering	Spring 2017 – Present
Tristan Dillon Yount	MS in Civil Engineering	Spring 2017 – Present

Graduated:

Zexia Li	MS in Civil Engineering	Sp 2017 - Summer 18
Cheng Chen	MS in Civil Engineering	Fall 2013 - Summer 16
Rezoana Islam	MS in Civil Engineering	Fall 2015 - Fall 2017
Brian Robertson	MS in Civil Engineering	Fall 2015 - Spring 2017
Kathleen S. McElrath	MS in Civil Engineering	Fall 2012 - Fall 2014

COURSES TAUGHT AT THE UNIVERSITY OF KANSAS

CE 461	Structural Analysis	Fall 2013 – present
CE 704	Dynamics and Vibrations	Spring 2016 – present
CE 895	Experimental Structural Dynamics	Fall 2015 – present

PROFESSIONAL ACTIVITIES

International

- Journal editorial board and conference committee membership
  - Sensors - MDPI, Special issue on Smart Sensors for Structural Health Monitoring, Guest Editor. (2018)
  - Frontiers in Built Environment: Bridge Engineering, Review Editor. (2016 - Present)
  - Frontiers in Built Environment: Structural Sensing, Review Editor. (2016 - Present)
  - Mathematical Problems in Engineering, Editorial Board Member. (2018 - Present)
  - Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems, SPIE Smart Structures & NDE, Conference Committee Member. (2017 – Present)

- Secretary and Member of the Board of Directors, the United States – China Earthquake Engineering Foundation. (2018 - Present)

- Peer review service for the following international journals
  - Advances in Mechanical Engineering
  - Advances in Structural Engineering, An International Journal
  - Computer-Aided Civil and Infrastructure Engineering
  - Earthquake Engineering and Engineering Vibration
  - Earthquakes and Structures, An International Journal
  - Engineering Computations
  - Frontiers in Built Environment, Structural Sensing
  - Frontiers in Built Environment, Bridge Engineering
  - International Journal of Structural Stability and Dynamics
  - Journal of Aerospace Engineering - ASCE
  - Journal of Bridge Engineering – ASCE
  - Journal of Culture Heritage – Elsevier
  - Journal of Earthquake Engineering
  - Journal of Materials in Civil Engineering – ASCE
  - Journal of Structural Engineering – ASCE
  - Measurement - Elsevier
  - Sensors - MDPI
  - Sensors Journal, IEEE
  - Sensors & Actuators: A. Physical - Elsevier
  - Shock and Vibration - Hindawi

- Smart Structures and Systems, An International Journal
- Structural Health Monitoring, An International Journal
- Structure and Infrastructure Engineering - Taylor & Francis
- The Scientific World Journal - Hindawi

- Peer review service for the following funding agencies
  - Natural Sciences and Engineering Research Council (NSERC) of Canada – Discovery Grant Application

- Session chair and mini-symposium organizer
  - Special Session organizer, 7th World Conference on Structural Control and Monitoring, Qingdao, China, July 23 – 25, 2018
  - Mini-symposium organizer, 2018 conference of Engineering Mechanics Institute (EMI 2018), Massachusetts Institute of Technology, Cambridge, Massachusetts, May 29-June 1, 2018
  - Session Chair, Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems, SPIE Smart Structures & NDE, Denver, CO, March 4-8, 2018.
  - Session Chair, Third Huixian International Forum on Earthquake Engineering for Young Researchers, Champaign-Urbana, IL, August 11-12, 2017.
  - Session Chair, 43rd Conference on Quantitative Nondestructive Evaluation (QNDE), Atlanta, GA, July 2016
  - Symposium organizer, Mini-symposium on Wireless Sensor Technology, 11th International Workshop on Advanced Smart Materials and Smart Structures Technology (11ANCRiSST), Champaign, IL, August, 2015
  - Session Chair, 6th World Conference on Structural Control and Monitoring, Barcelona, Spain, July 2014
  - Session Chair, 59th Annual Structural Engineering Conference, Lawrence, KS, March 2014

National

- Professional committee membership
  - Structural Control and Monitoring Committee, Engineering Mechanics Institute (EMI), American Society of Civil Engineers, Member. (May 2016 - Present)
  - Methods of Monitoring Structural Performance Committee, Structural Engineering Institute (SEI), American Society of Civil Engineers, Member. (January 2016 - Present)

- Proposal review
  - National Science Foundation, Grant Panelist, Arlington, VA, USA. (June 28-29, 2018)
  - National Science Foundation, Grant Panelist, Arlington, VA, USA. (December 18, 2017)
  - National Science Foundation, Ad-hoc Reviewer, Grant Proposal. (February 2017)
  - National Science Foundation, Grant Panelist, Arlington, VA. (December 7, 2016)

Professional Memberships/Honor Societies

- American Society of Civil Engineers, (August, 2014 - Present)
- Earthquake Engineering Research Institute, (August 2013 - Present)
- The International Society for Optics and Photonics, (February, 2012 - Present)
- Consortium of Universities for Research in Earthquake Engineering, (November, 2013 - 2016)
- American Society of Engineering Education, (October 2013 - December 2015)

UNIVERSITY SERVICE

Department/Unit Service

Civil, Environmental & Architectural Engineering
- CEAE Scholarship Committee. Chair. (August, 2014 - Present)
- Undergraduate Student Recruitment Committee. Member. (August, 2014 - Present)

- KU Student Chapter of the Earthquake Engineering Research Institute (EERI). Faculty Advisor. (August 2013 - Present)
- KU Structural Engineering Conference Planning Committee. Member. (2013 - Present)
- Structures Faculty Search Committee (three positions). Member. (December 2014 - April 2015)
- CEAE Professional Development Series. Presenter. (Spring 2014)
- CEAE Fundamentals of Engineering (FE) exam review session. Lecturer. (Fall 2016)
- KU Structural Engineering Conference. Moderator. (2014)

School/College Service
- School of Engineering Scholarship Committee. Member. (June 2015 - Present)
- Project Discovery Summer Camp. Organizer. (June 2016)
- Graduate Engineering Association Research Competition. Judge. (April 2014, April 2018)