Hongki Jo

Assistant Professor

Department of Civil Engineering and Engineering Mechanics
The University of Arizona
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EDUCATION

Ph.D. in Civil Engineering, August 2013
University of Illinois at Urbana-Champaign, Urbana, IL
Major in Structural Engineering
Thesis title: Multi-scale Structural Health Monitoring using Wireless Smart Sensors

M.S. in Civil Engineering, February 2001
KAIST, Daejeon, Korea
Major in Structural Engineering
Thesis title: Natural Frequency and Mode shape Sensitivity of Damped Systems

B.S. in Civil Engineering, February 1999
Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea
Graduate *first in the Department*, GPA 3.85/4.30 (A+ =4.3)

EMPLOYMENT

Assistant Professor, August 2013 ~ present
Department of Civil Engineering and Engineering Mechanics
The University of Arizona, Tucson, AZ

Graduate Research Assistant, September 2007 ~ July 2013
Department of Civil and Environmental Engineering
University of Illinois at Urbana-Champaign, Urbana, IL

Bridge Engineer/Manager, February 2001 ~ May 2007
Seoyeong Engineering Co., Ltd. Seoul, Korea

Graduate Research Assistant, March 1999 ~ January 2001
Department of Civil and Environmental Engineering
KAIST, Daejeon, Korea

RESEARCH INTERESTS

- Structural health monitoring (SHM)
- Model-integrated hybrid monitoring
- Vast sensor networks for city, nation-wide infrastructure monitoring
- Big data for structural risk/reliability assessment and management
- Real-time image processing for SHM
- Smartphone networks for SHM
- Bio-inspired sensing technologies
- Advanced functional materials
- Visualized SHM
- Full-scale dynamic testing
- Sustainable structural designs
- Bridge/Earthquake/Wind engineering
- Seismic retrofit and rehabilitation

PROFESSIONAL EXPERIENCE

Assistant Professor (August 2013 ~ present)
Department of Civil Engineering and Engineering Mechanics, The University of Arizona, Tucson, AZ

Senior Bridge Engineer/Manager (February 2001 ~ May 2007)
Division of Structure Design, Seoyeong Engineering Co. Ltd., Korea

- Incheon Bridge Project: ***The world's 5th longest cable-stayed bridge*** having 800m main span
- Hallim-Saenglim Project: Non-symmetric concrete-girder cable-stayed bridge
- Dolsan-Hwatae Bridge Project: Cable-stayed bridge having 520m main span
- Yansan-Domgmyeon Project: Expansion of national highway between Yangsan and Dongmyeon
- Ilsun Bridge Project: Expansion of national highway between Seonsan and Dogae
- Gumi-Hyunpoong Project: Expansion of national highway between Gumi and Hyunpoong

GRADUATE RESEARCH EXPERIENCE

Graduate Research Assistant (January 2008 ~ July 2013)
Department of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign
Advisor: Prof. B.F. Spencer, Jr.

- Wireless smart sensor network for structural health monitoring
- Structural damage detection
- Hybrid structural health monitoring

- Fatigue life monitoring of steel structure
- Effect of basement on building dynamics

Graduate Research Assistant (March 1999 ~ February 2001)
Structural Dynamics and Vibration Control Laboratory, KAIST, Korea
Advisor: Prof. In-Won Lee

- Developed an efficient and flexible eigenpair sensitivity algorithm to be applicable to not only non-conservative system, but also non-symmetric system, the case having repeated eigenvalues.

TEACHING EXPERIENCE

Instructor (August 2013 ~ present), The University of Arizona

CE 437/537 Advanced Structural Designs: Reinforced Concrete II (Spring 2015~17)
This course introduces the advanced concepts in the design of reinforced concrete structures from theories, numerical methods to practical system designs. Instructor's experiences as a practicing engineer make the students to be exposed to extensive real design problems from components- to system levels.

CE 335 Structural Designs: Reinforced Concrete (Fall 2013~16)
This course provides an introduction of RC structure design with not only theories, but also their applications to real-world structures. Instructor's extensive experiences in bridge design minimize the gap between the textbook and actual design of modern RC structures.

EM 634 Advanced Structural Dynamics (Fall 2014~16): newly developed class
This course introduces the advanced concepts in structural dynamics from theories to experimental methods; of which topics include modal analysis theory and implementation, data acquisition and analysis, digital signal processing, random vibration concepts, system identification, structural health monitoring and damage detection, advanced sensor technologies, and smart structure technologies.

CE 214 Statics (Fall 2016)
This course provides fundamental concepts in Statics from theories to applications for junior level students. Topic include equilibrium of 2D & 3D solid systems, geometric properties of areas and solids, truss, frame, machines, shear forces, bending moments, friction, and so on.

Graduate Teaching Assistant, University of Illinois at Urbana-Champaign
Structural Dynamics (Fall 2011)
Instructor: Prof. B.F. Spencer, Jr.

Research Advisor (August 2013 ~ present), The University of Arizona

- A Ph.D. student (Jan 2016 ~ Present): with research on Dynamic Load Identification using Augmented Kalman Filter
- A Ph.D. student (Sep 2015 ~ Present): with research on Bio-inspired Sonar Sensor Network for Bridge Scour Monitoring
- A Ph.D. student (Jan 2016 ~ Present): with research on Wireless Smart Sensor Network
- A MS student (Sep 2015 ~ Present): with research on Intelligent Bridge Load Rating using Hybrid Monitoring Framework
- A MS student (Sep 2015 ~ Present): with research on Optimization for Bridge Weigh In Motion
- A PostDoc (Feb 2014 ~ Jul 2016): with research on Real-time Image Processing for Dynamic Monitoring using Smartphone Technologies
- A PostDoc (Sep 2014 ~ Jun 2016): with research on i) Visualized SHM using Electroluminescent technologies and ii) Wireless Elastomeric Skin sensor for Steel Structure Fatigue monitoring
- A MS student (Sep 2014 ~ May 2016): with research on Model-integrated Hybrid Monitoring for Plate structures
- An Undergrad student (June 2014 ~ May 2015): with research on Real-time Image Processing for Dynamic Monitoring using Smartphone Technologies
- An Undergrad student (June 2015 ~ May 2016): with research on Smartphone Network for SHM
- An Undergrad student (Aug 2015 ~ May 2016): with research on Automated Concrete Crack Monitoring using Smartphone Technologies

Graduate Teaching Assistant (March 2000 ~ June 2000)
Vibration Engineering, KAIST, Korea
Instructor: Prof. In-Won Lee

INVITED PRESENTATIONS

- *Next Generation Structural Health Monitoring*, Centennial Luncheon Award, The University of Arizona, Tucson, Oct 2015.
- *Real-time Image Processing for Non-contact Monitoring of Dynamic Displacement using Smartphone Technologies*, University of Cambridge, Cambridge, UK, June 2015.
- *Multi-scale Smart Monitoring: revolutionizing the way civil infrastructure is monitored*, Korea Railroad Research Institute, Uiwang, Korea, July 2014.
- *Multi-scale Smart Monitoring: revolutionizing the way civil infrastructure is monitored*, Ulsan National Institute of Science and Technology, Ulsan, Korea, July 2014.
- *Bridge Monitoring using Wireless Smart Sensor Networks*, 63rd Roads and Streets Conference, Tucson, Arizona, Apr. 2014.
- *Multi-scale Structural Health Monitoring*, The University of Arizona, Tucson, Arizona, Apr. 2013.

- *Multi-scale Structural Health Monitoring*, Clarkson University, Potsdam, New York, Apr. 2013.
- *Multi-scale Structural Health Monitoring*, North Dakota State University, Fargo, North Dakota, Apr. 2013.

Invited Lectures

- *Community of Practice (COP)*, Seoyeong Engineering Co. Ltd., Korea (April 2007 ~ May 2007)
  - Lecture1: Design of cable-stayed bridge: Planning & parametric study
  - Lecture2: Design of cable-stayed bridge: Modeling & analysis
  - Lecture3: Design of cable-stayed bridge: Design of girder, cable, and pylon
- *Seismic design of cable-stayed bridge*, Sejong University, Seoul, Korea (June 2006)

PROFESSIONAL SERVICE

Editorial Board Member

Frontiers in Built Environment/Structural Sensing, ISSN: 2297-3362 (2015 – present)

Journal of Information Processing in Agriculture, ISSN: 2214-3173 (2014 – 2016)

ASCE Member

Cable-supported Bridge Committee (2017 – present)

Bridge Management, Inspection and Rehabilitation Committee (2017 – present)

Affiliations

American Society of Civil Engineers (ASCE)

The Society of Photo-optical Instrumentation Engineering (SPIE)

Proposal Referee

- National Science Foundation: NSF CAREER proposal ad-hoc reviewer (Nov. 2014)
- National Science Foundation: NSF proposal review panel (May 2016)

Journal Referee

- *Smart Structures and Systems*
- *Smart Materials and Structures*
- *Proceedings of the Royal Society: Part A*
- *Computer-aided Civil and Infrastructure Engineering*
- *IEEE Sensors*
- *Journal of Earthquake Engineering*
- *International Journal of Distributed Sensor Network*
- *Measurement Science and Technology*
- *Journal of Civil Engineering and Science*
- *Applied Computing and Informatics*

- *Journal of Computing in Civil Engineering*
- *Information Processing in Agriculture*
- *Journal of Intelligent Material Systems and Structures*
- *Advances in Structural Engineering*

OTHER SERVICE / OUTREACH

- *Summer camp program coordinator in Civil Engineering side, UA Summer Engineering Academy, 2015*
- *Seminar speaker, Research and Learning seminar program for Mexican Civil Engineering students, 2016*
- *Founder and president, University of Illinois Civil Engineering Korean Tennis Club, IL, 2011-2013*
- *President, Tucson Korean Tennis club, AZ, 2014-President*

HARDWARE & SOFTWARE DEVELOPMENT

Smartphone Software (http://smartstructure.weebly.com/rino.html)

Developed an iOS application for real-time dynamic monitoring (US Patent: 20160349040 A1)

Wireless Smart Sensors (http://smartstructure.weebly.com/smart-sensor.html)

Developed a variety of multi-metric sensor boards for Imote2 platform

- High-sensitivity accelerometer (SHM-H) board, allowing temperature compensated low-level ambient acceleration measurement up to 0.05mg at 15Hz bandwidth; 170 units are being used in 27 institutes in 5 countries
- High-precision strain sensor (SHM-S) board, allowing up to 2500-times signal amplification with autonomously balanceable high-precision Wheatstone bridge; 30 units by 3 institutes in 3 countries
- Data acquisition (SHM-DAQ) board, allowing synchronous implementation of external sensors into sensor network; 88 units by 6 institutes in 4 countries
- Wind pressure (SHM-P) board, allowing synchronous wind pressure measurements
- Capacitive strain sensor board for fatigue monitoring of steel structures, allowing to accommodate an elastomeric capacitive strain skin sensor into Imote2 network
- Electroluminescent driving board for color/brightness changeable paint

JOURNAL PUBLICATIONS

GOOGLE SCHOLAR: https://scholar.google.com/citations?user=JywdFgQAAAAJ&hl=en

1. **Jo, H.**, Park, K.S., Shin, H.R., and Lee, I.W. (2000), "Improved Sensitivity the Korean Society of Civil engineers, 20(6-A), 997-1004. (in Korean)
2. Choi, K.M., **Jo, H.**[*], Kim, W.H., and Lee, I.W. (2004), "Sensitivity Analysis of Non-conservative Eigensystems", *Journal of Sound and Vibration*, 274(3-5), 997-1011.
3. Jang, S., **Jo, H.,** Cho, S., Mechitov, K.A., Rice, J.A., Sim, S.H., Jung, H.J., Yun, C.B., Spencer Jr., B.F. and Agha, G. (2010), "Structural Health Monitoring of a Cable-stayed Bridge Using Smart Sensor Technology: Deployment and Evaluation", *Smart Structures and Systems*, 6(5-6), 439-459.
4. Cho, S., **Jo, H.,** Jang, S., Park, J.W., Jung, H.J., Yun, C.B., Spencer Jr., B.F., and Seo, J. (2010), "Structural Health Monitoring of a Cable-stayed Bridge Using Smart Sensor Technology: Data Analyses", *Smart Structures and Systems*, 6(5-6), 461-480.
5. Sim, S.H., Spencer Jr., B.F., Carbonell-Márquez, J.F., and **Jo, H.** (2011), "Decentralized Random Decrement Technique for Efficient Data Aggregation and System Identification in Wireless Smart Sensor Networks", *Probabilistic Engineering Mechanics*, 26(1), 81-91.
6. **Jo, H.,** Sim, S.H., Nagayama, T., and Spencer Jr., B.F. (2012), "Development and Application of High-sensitivity Wireless Smart Sensors for Decentralized Stochastic Modal Identification", *Journal of Engineering Mechanics*, 138 (6), 683-694.
7. Park, J.W., Jung, H.J., **Jo, H.,** and Spencer Jr., B.F. (2012), "Feasibility Study of Micro Wind Turbines for Powering Wireless Sensors in a Cable-stayed Bridge", *Energies*, 5, 3450-3464.
8. Jang, S., Sim, S.H., **Jo, H.,** and Spencer Jr., B.F. (2012), "Full-scale Experimental Validation of Decentralized Damage Identification using Wireless Smart Sensors", *Smart Materials and Structures*, 21(11), 1-13.
9. **Jo, H.,** Sim, S.H., Tatkowski, A., Spencer Jr., B.F., and Nelson, M.E. (2013), "Feasibility of Displacement Monitoring using Low-cost GPS Receivers", *Structural Control and Health Monitoring*, 20 (9), 1240-1254.
10. **Jo, H.,** Park, J.W., Spencer Jr., B.F., and Jung, H.J. (2013), "Development of High-sensitivity Wireless Strain Sensor for Structural Health Monitoring", *Smart Structures and Systems*, 11 (5), 477-496.
11. Sim, S.H., Li, J., **Jo, H.,** Park, J.W., Cho, S., Spencer Jr., B.F., and Jung, H.J. (2014), "A Wireless Smart Sensor Network for Automated Monitoring of Cable Tension", *Smart Materials and Structures*, 23 (2), doi:10.1088/0964-1726/23/2/025006.
12. An, Y., **Jo, H.,** Spencer Jr., B.F., and Ou, J. (2014), "A Damage Localization Method based on the Jerk Energy", *Smart Materials and Structures*, 23 (2), doi:10.1088/0964-1726/23/2/025020.

13. Linderman, L.E., **Jo, H.**, and Spencer Jr., B.F. (2014), "Low-latency Data Acquisition for Wireless Control Applications", *IEEE: Sensors Journal*, 15 (3), 1800-1809.
14. Moreu, F., **Jo, H.**, Li, J., Kim, R.E., Cho, S., Kimmle, A., Scola, S., Le, H., Spencer Jr., B.F., and LaFave, J.M. (2014), "Dynamic Assessment of Timber Railroad Bridges using Transverse Displacement", *ASCE: Journal of Bridge Engineering*, 20 (10), doi: 10.1061/(ASCE)BE.1943-5592.0000726.
15. Spencer Jr., B.F., **Jo, H**., Mechitov, K.A., Li, J., Sim, S.H., Kim, R.E., Cho, S., Linderman, L.E., Moinzadeh, P., Giles, R.K., and Agha, G. (2015), "Recent Advances in Wiress Smart Sensors for Multi-scale Monitoring and Control of Civil Infrastructure", *Journal of Civil Structural Health Monitoring*, Published online ahead of print, doi:10.1007/s13349-015-0111-1.
16. Min, J.H., Gelo, N.J., and **Jo, H.** (2015), "Non-contact and Real-time Dynamic Displacement Monitoring using Smartphone Technologies", *Journal of Life Cycle Reliability and Safety Engineering*, 4 (2), 40-51.
17. Moreu, F., Li, J., **Jo, H.,** Kim, R.E., Scola, S., Spencer Jr., B.F., and LaFave, J.M. (2015), "Reference-free Displacement Estimations for Timber Railroad Bridges Assessment using Wireless Smart Sensors", *ASCE: Journal of Bridge Engineering, 21 (2),* doi:10.1061/(ASCE)BE.1943-5592.0000805.
18. Xu, J. and **Jo, H.** (2016), "Development of High-sensitivity and Low-cost Electroluminescent Strain Sensor for Structural Health Monitoring", *IEEE: Sensors Journal,* 16 (7), 1962 – 1968.
19. Xu, J., Ahamed, T., Min, J. and Jo, H., "Dynamic Characterization of High-sensitivity Electroluminescent Strain-visualization Sensor", *IEEE: Sensors Journal*, under review.
20. Melvin, D., Khodabandeloo, B. and Jo, H., "Strain response prediction at unmeasured locations of plate structures", *ASCE: Journal of Structural Engineering*, under review.

CONFERENCE PUBLICATIONS

1. **Jo. H.,** Park, S.K., and Lee, I.W. (2000), "Simplified Algebraic Method for Computing Eigenpair Sensitivities of Damped Systems", *ECCOMAS 2000, European Congress on Computational Methods in Applied Sciences and Engineering*, Barcelona, Spain.
2. Moon, Y.J., **Jo, H.,** Park, S.K., and Lee, I.W. (2001), "Modified Modal Method for Calculating Eigenpair Sensitivity of Asymmetric Damped System", *Conference on Korean Society of Steel Construction*, Seoul, Korea (in Korean).
3. **Jo, H.,** Lee, I.W., and Ko, M.K. (2001), "Simplified Algebraic Method for Computing Eigenpair Sensitivities of Damped Systems", *The 1st International Structural Engineering and Construction Conference*, Honolulu, Hawaii (Invited Paper).

4. **Jo, H.,** Oh, J.W., and Lee, I.W. (2000), "Natural Frequency and Mode Shape Sensitivities of Damped Systems", *Conference on Korean Society of Steel Construction*, Seoul, Korea (in Korean).
5. **Jo, H.**, Park, S.K., and Lee, I.W. (2000), "Improved Algebraic Method for Computing Eigenpair Sensitivities of Damped Systems," *Conference on Computational Structural Engineering*, Seoul, Korea.
6. Suh, S.K., Lee, S.H., **Jo, H.** (2005), "Plan and Design of Incheon Bridge", *The 1st Technical Conference of the Korean Society of Steel Construction*, Seoul, Korea (in Korean).
7. Cho, S., Jang, S., **Jo, H.,** Park, J.W., Jung, H.J., Yun, C.B., Spencer Jr., B.F., Nagayama, T., and Seo, J. (2009), "Cable-stayed Bridge Test-bed for Long-term Structural Health Monitoring using Smart Wireless Sensor Network", *Proc. CODE 2009 International Conference on Computational Design in Engineering*, Seoul, Korea.
8. Jang, S., Rice, J.A., Li, J., **Jo, H.,** Spencer Jr., B.F., and Wang, Z. (2009), "Structural Monitoring of a Historic Truss Bridge using a Wireless Sensor Network", *Proc. ANCRiSST 2009 The Fifth International Workshop on Advanced Smart Materials and Smart Structures Technology*, Boston, Massachusetts.
9. **Jo, H.,** Rice, J.A., Spencer Jr., B.F., and Nagayama, T. (2010), "Development of a High-sensitivity Sensor Board or Structural Health Monitoring", *Proc. of SPIE Smart Structures/NDE*, San-Diego, California.
10. Cho, S., Jang, S., **Jo, H.,** Mechitov, K.A., Rice, J.A., Jung, H.J., Yun, C.B., Spencer Jr., B.F., Nagayama, T., and Seo, J. (2010), "Structural Health Monitoring System of a Cable-stayed Bridge using a Dense Array of Scalable Smart Sensor Network", *Proc. of SPIE Smart Structures/NDE*, San-Diego, California.
11. Park, J.W., Jung, H.J., **Jo, H.,** Jang, S., and Spencer Jr., B.F. (2010), "Feasibility Study of Wind Generator for Smart Wireless Sensor Node in Cable-stayed Bridge", *Proc. of SPIE Smart Structures/NDE*, San-Diego, California.
12. Jang, S., Sim, S.H., **Jo, H.,** Spencer Jr., B.F. (2010), "Decentralized Full-scale Bridge Health Monitoring using Wireless Smart Sensors", *Proc. of SPIE Smart Structures / NDE*, San-Diego, California.
13. Cho, S., Park, J.W., Jung, H.J., Yun, C.B., Jang, S., **Jo, H.,** Spencer Jr., B.F., Nagayama, T., and Seo, J. (2010), "Structural Health Monitoring of a Cable-stayed Bridge using Acceleration Data via Wireless Smart Sensor Network", *Proc. IABMAS 2010 The fifth International Conference on Bridge Maintenance, Safety and Management*, Philadelphia, Pennsylvania.
14. Jang, S., **Jo, H.,** Cho, S., Mechitov, K.A., Rice, J.A, Sim, S.H., Jung, H.J., Yun, C.B., Spencer Jr., B.F., and Agha, G. (2010), "Autonomous Structural Health Monitoring using Wireless Smart Sensors for a Cable-stayed Bridge", *Proc. IABMAS 2010 The fifth International Conference on Bridge Maintenance, Safety and Management*, Philadelphia, Pennsylvania.
15. Cho, S., Park, J.W., Jang, S., **Jo, H.,** Jung, H.J., Yun, C.B., and Spencer Jr., B.F. (2010). "Structural Health Monitoring using Wireless Smart Sensor Networks for

a Cable-stayed Bridge", *Proc. of the 6th International Conference on Computational Stochastic Mechanics*, Rodos, Greece.

16. Park, J.W., Cho, S., Jung, H.J., Yun, C.B., Jang, S., **Jo, H.,** Spencer Jr., B.F., Nagayama, T., and Seo, J. (2010), "Long-term Structural Health Monitoring System of a Cable-stayed Bridge based on Wireless Smart Sensor Networks and Energy Harvesting Techniques", *Proc. the 5th World Conference of Structural Control and Monitoring*, Tokyo, Japan.
17. **Jo, H.,** Sim, S.H., Nagayama, T., and Spencer, Jr., B.F. (2010), "Decentralized Stochastic Modal Identification using High Sensitivity Wireless Smart Sensors", *Proc. 5th World Conference on Structural Control and Monitoring*, Tokyo, Japan.
18. **Jo, H.,** Sim, S., Mechitov, K.A., Kim, R., Li, J., Moinzadeh, P., Spencer, B.F., Park, J., Cho, S., Jung, H., Yun, C., Rice, J.A., and Nagayama, T. (2011), "Hybrid wireless smart sensor network for full-scale structural health monitoring of a cable-stayed bridge," *Proc. of SPIE Smart Structures/NDE*, San-Diego, California.
19. Jang, S., Sim, S.H., **Jo, H.,** and Spencer Jr., B.F. (2011), "Decentralized Full-scale bridge damage identification using wireless smart sensors", *Proc. of SPIE Smart Structures/NDE*, San-Diego, California. (Top downloaded paper 'Sensing & Measurement', SPIE Digital Library)
20. **Jo, H.,** Sim, S., Tatkowski, A., Spencer Jr., B.F., and Nelson, M.E. (2011), "Bio-inspired Structural Displacement Monitoring Strategy using Low-cost GPS Receivers: Feasibility Test", *Proc. of 2011 World Congress on Advances in Structural and Mechanics (ASEM11+)*, Seoul, Korea.
21. Sim, S.H., Li, J., **Jo, H.,** Park, J., Cho, S., and Spencer Jr., B.F. (2011), "Automated Cable Tension Monitoring using Smart Sensors", *Proc. of 2011 World Congress on Advances in Structural and Mechanics (ASEM11+)*, Seoul, Korea.
22. Park, J., Jung, H.J., Yun, C.B., **Jo. H.,** and Spencer, Jr. B.F. (2011), "Feasibility of Self-powered Wireless Smart Sensor Network for Long-term Structural Health Monitoring", *Proc. of SPIE Smart Structures / NDE*, San-Diego, California.
23. **Jo, H.,** Park, J., and Spencer, Jr. B.F. (2012) "Design and Validation of High-Precision Wireless Strain Sensors for Structural Health Monitoring of Steel Structures", *Proc. of SPIE Smart Structures/NDE*, San-Diego, California.
24. Kim, R.E., Nagayama, T., **Jo, H.,** and Spencer, Jr. B.F. (2012) "Preliminary Study of Low-cost GPS Receivers for Time Synchronization of Wireless Sensors", *Proc. of SPIE Smart Structures / NDE*, San-Diego, California.
25. Moreu, F., Spencer Jr., B.F., LaFave, J., Cho, S., Kim, R.E., **Jo, H.,** and Li, J. (2012), "Structural Health Monitoring of Railway Bridges", *AREMA 2012 Annual Conference & Exposition*, Chicago, Illinois.
26. **Jo, H.** and Spencer, Jr. B.F (2013), "Multi-Metric Model-based Fatigue Life Monitoring of Bridges", *Proc. of International Symposium on Innovation & Sustainability of Structures in Civil Engineering*, Harbin, China. (Keynote speech)
27. **Jo, H.** and Spencer, Jr. B.F. (2014), "Multi-Metric Model-based Structural Health Monitoring", *Proc. of SPIE Smart Structures/NDE*, San-Diego, California.
28. **Jo, H.** and Spencer, Jr. B.F. (2014), "Multi-Metric Displacement Monitoring using

Model-based Kalman Filter", *Proc. of 6th World Conference on Structural Control and Monitoring*, Barcelona, Spain.

29. Khodabandeloo, B. and **Jo, H.** (2015), "Broadband Dynamic Load Identification using Augmented Kalman Filter", *Proc. of 6th International Conference on Advances in Experimental Structural Engineering and 11th International Workshop on Advanced Smart Materials and Smart Structures Technology*, Urbana, Illinois.
30. Lee, S., Jeong, J., Knez, K.P., Min, J.H., and **Jo, H.** (2016), "Practical application of RINO, a smartphone-based dynamic displacement sensing application for wind tunnel tests", *Proc. of SPIE Smart Structures/NDE,* Las Vegas, Nevada.
31. Melvin, D., **Jo, H.** and Khodabandeloo, B. (2016), "Multi-metric strain estimation at unmeasured locations of plate structures using augmented Kalman filter", *Proc. of SPIE Smart Structures/NDE,* Las Vegas, Nevada.
32. Xu, X. and **Jo, H.** (2016), "High-sensitivity strain visualization using electroluminescence technologies", *Proc. of SPIE Smart Structures/NDE,* Las Vegas, Nevada.
33. Min, J.H., Gelo, N.J., and **Jo, H.** (2016), "Real-time image processing for non-contact monitoring of dynamic displacements using smartphone technologies", *Proc. of SPIE Smart Structures/NDE,* Las Vegas, Nevada.

TECHNICAL REPORT

1. Spencer Jr., B.F., **Jo, H.,** Wilcoski, J., and Bergman, L.A. (2009), "Effect of Basements on Building Dynamic Response", *ERDC-CERL Technical Report*, TR-10-6, US Army Corps of Engineers, Washington, DC.
2. 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 Report Series (NSEL Report Series ISSN 1940-9826).* No. 022, University of Illinois at Urbana-Champaign (http://hdl.handle.net/2142/16300).

TECHNICAL PRESENTATIONS

1. *Improved Algebraic Method for Computing Eigenpair Sensitivities of Damped Systems*, Conference on Computational Structural Engineering, Seoul, Korea, April 2000.
2. *Natural Frequency and Mode Shape Sensitivities of Damped Systems*, Conference on Korean Society of Steel Construction, Seoul, Korea, June 2000.
3. *Simplified Algebraic Method for Computing Eigenpair Sensitivities of Damped System*, The 13th KKNN Symposium on Civil Engineering, Taipei, Taiwan, December 2000.
4. *Plan and Design of Incheon Bridge*, The 2005 Annual Conference of the Structural Engineering Committee of the Korean Society of Civil Engineers, Seoul, Korea, June 2005.

5. *Plan and Design of Incheon Bridge*, The 4th Annual EKS Retreat, Robert Allerton Park, Monticello, Illinois, February 2008 (poster).
6. *Smart Sensor Networks for Structural Health Monitoring of Cable-stayed Bridge*, The 5th Annual EKS Retreat, Robert Allerton Park, Monticello, Illinois, February 2009.
7. *Structural Health Monitoring High-sensitivity Accelerometer Board*, The 6th Annual EKS Retreat, Robert Allerton Park, Monticello, Illinois, February 2010.
8. *Development of a High-sensitivity Sensor Board or Structural Health Monitoring*, SPIE Smart Structures/NDE, San-Diego, California, March 2010.
9. *Decentralized Stochastic Modal Identification using High Sensitivity Wireless Smart Sensors*, The 5th World Conference on Structural Control and Monitoring, Tokyo, Japan, July 2010.
10. *Hybrid Smart Sensor Network for Full-scale Structural Health Monitoring of Cable-stayed Bridge*, The 7th Annual EKS Retreat, Robert Allerton Park, Monticello, Illinois, February 2011.
11. *Overview of Imote2 Sensor Board Development*, Workshop on Cyber-Physical Co-Design of Wireless Monitoring and Control for Civil Infrastructure, Urbana, Illinois, February 2011.
12. *Hybrid Wireless Smart Sensor Metwork for Full-scale Structural Health Monitoring of a Cable-stayed Bridge*, SPIE Smart Structures/NDE, San-Diego, California, March 2011 (both oral and poster presentation, NSF poster presentation series).
13. *High-sensitivity Wireless Strain Sensor for Structural Health Monitoring*, The 8th Annual EKS Retreat, Robert Allerton Park, Monticello, Illinois, February 2012.
14. *Design and Validation of High-Precision Wireless Strain Sensors for Structural Health Monitoring of Steel Structures*, SPIE Smart Structures/NDE, San-Diego, California, March 2012 (both oral and poster presentation, NSF poster presentation series).
15. *Multi-Metric Model-based Structural Health Monitoring*, SPIE Smart Structures/NDE, San-Diego, California, March 2014.
16. *Multi-Metric Displacement Monitoring using Model-based Kalman Filter*, The 6Th World Conference on Structural Control and Monitoring, Barcelona, Spain, March 2014.
17. *Real-time Image Processing for Non-contact Monitoring of Dynamic Displacement using Smartphone Technologies*, The Cambridge Conference on Wireless Sensor Network for Civil Engineering and Infrastructure Monitoring, Cambridge, UK, June 2015.
18. *Broadband Dynamic Load Identification using Augmented Kalman Filter*, 2015 Joint Conference AESE/ANCRiSST, Urbana, Illinois, August 2015.
19. *Next generation Structural Health Monitoring*, Centennial Award Seminar, Tucson, Arizona, November 2015.
20. *Smart Structure Technologies for Civil Infrastructure Monitoring*, Pima Association of Governments Regional Council Meeting, Tucson, Arizona, February 2016.
21. *Structural Health Monitoring Research at the University of Arizona*, ASCE

Geotechnical and Structural Engineering Congress, Phoenix, Arizona, February 2016.

22. *Real-time image processing for non-contact monitoring of dynamic displacements using smartphone technologies*, SPIE Smart Structures/NDE, Las Vegas, Nevada, March 2016.