UCONN

UNIVERSITY OF CONNECTICUT

Curriculum Vitae

Shinae Jang, Ph.D., P.E.

Associate Professor in Residence
Director of Undergraduate Studies
Department of Civil and Environmental Engineering
University of Connecticut

Contact Information:
261 Glenbrook Road, Unit 3037
Storrs, CT 06269-3037
Phone: (860) 486-0540
Fax: (860) 486-2298
Email: shinae.jang@uconn.edu
http://smart.engr.uconn.edu

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EDUCATION

Ph.D. in Civil Engineering, 2010
Civil and Environmental Engineering, University of Illinois at Urbana-Champaign
Dissertation Title: Structural Health Monitoring for Bridge Structures using Smart Sensors
Dissertation Advisor: Prof. Billie F. Spencer, Jr.

M.S. in Civil Engineering, 2003
Civil and Environmental Engineering, Korea Advanced Institute of Science and Technology, Korea
Thesis Title: Comparative Study on Hilbert-Huang Transform and Wavelet Transform for
Structural Damage Detection
Thesis Advisor: Prof. Chung-Bang Yun

B.S. in Civil Engineering, 2001
Civil and Environmental Engineering, Korea Advanced Institute of Science and Technology, Korea
Summa Cum Laude

APPOINTMENTS

Director of Undergraduate Studies, 2020 - present
Associate Professor in Residence, 2017 - present
Civil and Environmental Engineering, University of Connecticut

Assistant Professor in Residence, 2014 - 2017
Civil and Environmental Engineering, University of Connecticut

Assistant Professor, 2010 - 2014
Civil and Environmental Engineering, University of Connecticut

LICENSURE

Professional Engineer, Connecticut, PEN.0032528

AREAS OF RESEARCH INTEREST

Smart Structures, Damage Detection Algorithms, Structural Health Monitoring, Wireless Smart Sensor Technology, Finite Element Modeling and Model Updating, Piezoelectric Energy Harvesting, RFID-based Crack Monitoring, Machine Learning, Uncertainty Quantification

HONORS AND AWARDS

2018	Civil Engineering Educator of the Year, 11th Annual Achievement in Civil Engineering (ACE) Awards, Connecticut Society of Civil Engineers
2017	Provost Academic Plan Mini Grant, Center for Excellence in Teaching and Learning *Online active learning module for engineering research methods*
2014	The 2014 JM Ko Medal of Advances in Structural Engineering *S. Jang, B. F. Spencer, Jr., J. A. Rice and Z. Wang (2008), "Full-Scale Experimental Validation of High-Fidelity Wireless Measurement on a Historic Truss Bridge", Vol. 14, No. 1, pp. 93-101*
2012	ASCE, Excellence in Civil Engineering Education (ExCEEd) fellowship
2011 Mar.	Top downloaded paper, 'Sensing & Measurement' SPIE Digital Library *S. Jang, S.H. Sim, H. Jo, B.F. Spencer, Jr. (2011) "Decentralized bridge health monitoring using wireless smart sensors."*

COURSES TAUGHT

Undergraduate Courses
ENGR1166 Foundation of Engineering
CE2110 Applied Mechanics I: Statics
CE2120 Applied Mechanics II: Dynamics
CE2410 Geomatics and Spatial Measurement
CE3110 Mechanics of Materials
CE3610 Basic Structural Analysis
CE4610 Advanced Structural Analysis
CE4900W-003D Civil Engineering Project I
CE4920W-003D Civil Engineering Project II

Graduate Courses
CE5150 Structural Vibrations
CE5650 Structural Health Monitoring and Sensors

STUDENT ADVISING

PhD Students as Major Advisor (with Dissertation Topics)
[1] Pierre Fils, expected in 2022
    Uncertainty quantification of structural health monitoring for building structures
[2] Rosana Martinez-Castro, completed in 2018
    Structural health monitoring of critical load-carrying members
[3] Edward Eskew, completed in 2017
    Structural health monitoring of civil structures for progressive collapse after a blast
[4] Chenhao Jin, completed in 2017
    Real-time damage detection for civil structures using big data
[5] Jingcheng Li, completed in 2014
    Structural health monitoring of an in-service highway bridge with uncertainties

MS Students as Major advisor (with Thesis Topics)
[1] Benjamin Bruciati, completed in 2019
    Advancements in novel material RFID-based crack sensing and bridge weigh-in-motion
[2] John Hurlburt, completed in 2018: Non-Thesis M.S. program
    Structural analysis of a pile supported building
[3] Thomas Curry, completed in 2015: Non-Thesis M.S. program
[4] Valeri Kolev, completed in 2015
    Bridge weigh-in-motion long-term traffic monitoring in the state of Connecticut.
[5] Priscilla Mensah-Bonsu, completed in 2013
    Computer-aided engineering tools for structural health monitoring under operational conditions.
[6] Sushil Dahal, completed in 2013
    Structural health monitoring for in-service highway bridges using smart sensors.

OUTREACH PROGRAMS

ENGR1000 Outside Classroom Presentation: Smart Structures (2019)
Presentation on recent development in field applications of smart sensors for civil infrastructure

Connecticut Science Olympiad (2018)
Judge of Mission Possible 'Towers 18'

Engineering Open House: CEE Student Groups (2018)
Introduction of CEE curriculum, Structures lab, and Research activities in Structural Health Monitoring

Women in Engineering Day Lab Visit (2017)
Lab tour and sensor demos: RFID-based crack sensor, fiber optic strain sensor

ENGR1000 Outside Classroom Presentation: Smart Structures (2017)
Presentation and demos

Explore Engineering (2016, 2017)
Structural Engineering introduction program

Engineering Open House: CEE Student Groups (2015, 2016)
Introduction of structural engineering group, student groups

Pre-College Summer Academic Program: Workshop Program (2014, 2015)
"Structural mechanics applications and you" lectures and Lab demonstrations

Engineering Open House: Civil Engineering and Dynamics (2011, 2012, 2013, 2017, 2018)
Introduction of civil engineering and structural dynamics by posters and demonstrations

ENGR1000 Introduction to Engineering: Structural Engineering (2010, 2011)
Lectures and hands-on demonstrations

Connecticut Innovation Convention presentation (2012, 2013, 2014, 2015, 2016, 2017)
Lectures and hands-on demonstrations

RESEARCH EXPERIENCE

Associate Professor in Residence (2017~present)
- Bridge weigh-in-motion using long-term strain data
- Calibration of Fiber Bragg Grating sensor for bridge deck strain measurement
- Safety assessment of buildings under blast for progressive collapse
- Model updating for quantitative damage detection of bridges
- Digital image correlation of crack propagation
- Development of RFID-based crack sensors using low cost commercial RFID tags
- Experimental validation of RFID-based crack sensors on crack propagation tests on metal specimen
- Performance validation of RFID-based crack sensors on Ultra High Performance Concrete (UHPC) specimen
- Field validation of RFID-based crack sensors for building structures
- Strain response shape categorization of field Bridge Weigh-in-Motion signals for vehicle categorization
- Uncertainty quantification of RFID-based crack detection using Artificial Neural Network
- RFID-based crack detection for crumbling foundation in Connecticut

Assistant Professor in Residence (2014~ 2017)
- Autonomous vehicle counting using machine learning and image processing
- Development of low cost wireless passive crack sensors for welded cover plates using RFID antenna sensors
- Development of building hazard mitigation tools based on vibration-based health monitoring and blast engineering under terrorist attack

- Established a computational framework of sensor-aided cyber-physical system for cable-stayed bridge by control-monitoring interaction
- Development of real-time damage detection of an in-service highway bridge using Extended Kalman-Filter and Statistical Process Control
- Uncertainty evaluation of modal properties of in-service highway bridge under severe environmental influence
- Probabilistic study of progressive collapse of a building structure under terrorist attack
- Estimation of the weight and speed of trucks based on vibration data

Assistant Professor (2010~ 2014)
- Full-scale damage identification using flexibility-based method on in-service highway bridge
- Development of hybrid wireless sensor board with displacement measurement capability
- Multi-scale model updating for in-service highway bridge, Flyover Bridge, Hartford, Connecticut
- First deployment of wireless smart sensor network on in-service highway bridges in Meriden, Connecticut
- Development of modal-flexibility based expansion joint monitoring system under temperature fluctuation
- Development of theoretical model of piezoelectric energy harvester for railway monitoring
- Development and deployment of wireless expansion joint monitoring sensor on an in-service highway bridge, Founders Bridge, Hartford, Connecticut

Research Assistant (2004~2010)
- Deployment of the world's largest smart sensor network on the Jindo Bridge in South Korea
- Monitoring a historic moveable truss bridge, Rock Island Arsenal Bridge in Illinois
- Steel corrosion extent estimation through correlation of visual inspection and model updating
- Application and implementation of structural monitoring system using smart wireless sensor on the Mahomet Bridge in Illinois
- Development of the decentralized Receptance-based damage detection method for wireless smart sensor networks
- Long-term performance evaluation of smart sensor network on the Siebel Center Staircase at UIUC
- Model updating for historic structures.
- Reliability-analysis of a damage detection method using FORM method to verify the performance of the method with existence of structural parameter uncertainties
- Development of static strain-based structural health monitoring algorithm and experimental verification

JOURNAL PUBLICATIONS

[1] Fils, P. **Jang, S.***, Sherpa, R. (2021). "Field implementation of low-cost RFID-based crack monitoring using machine learning." *Structural Monitoring and Maintenance* (submitted Feb 2021).
[2] Eskew, E. L. and **Jang, S.*** (2019). "Remaining capacity estimation for buildings after an explosion using the adaptive alternate path analysis." *Advances in Structural Engineering 1-12.* (published online.)
[3] Bruciati, B., **Jang, S.***, Fils, P. (2019). "RFID-Based crack detection of ultra high-performance concrete retrofitted beams." *Sensors 2019, 19, 1573*; doi:10.3390/s19071573. (published online)
[4] Martinez-Castro, R.E., **Jang, S.***, Kim, J., and Wentworth, A. (2019). "Experimental evaluation of a low-cost RFID-based sensor to crack propagation." *Journal of Aerospace Engineering, ASCE,* 32 (2); 04019003.

[5] Martinez-Castro, R., **Jang, S.*** (2018). "Wireless vibration-based cable tension estimation system using a single-board computer and peripheral sensors." (Under Review, submitted in August, 2018)

[6] Martinez-Castro, R., **Jang, S.***, Kim, J., Wentworth, A. (2018) "Evaluation of a passive RFID-based crack detection sensor to crack propagation on a metallic surface." *ASCE, Journal of Aerospace Engineering* (Accepted).

[7] Eskew, E., **Jang, S.*** (2018). "Blast structural assessments via updated pressure-impulse diagrams", *Journal of Impact Engineering* (Under Review, submitted in July, 2018).

[8] Martinez-Castro, R., **Jang, S**. *, Nicholas, J., and Bansal, R. (2017) "Experimental assessment of an RFID-based crack sensor for steel structures*" Smart Materials and Structures,* 26 (8) http://iopscience.iop.org/article/10.1088/1361-665X/aa7cd8/meta;jsessionid=34B2A31915D7CF0173CD0803D3CCF662.ip-10-40-1-105 (published online).

[9] Jin, C., **Jang, S.***, Sun, X. (2016) "An integrated real-time structural damage detection method based on extended Kalman filter and dynamic statistical process control," *Advances in Structural engineering,* doi: 10.1177/1369433216658484, http://ase.sagepub.com/content/early/2016/07/0 4/1369433216658484 (published online).

[10] Eskew, E., **Jang, S.*** (2016) "Remaining stiffness estimation of buildings using incomplete measurements", *Structural Control and Health Monitoring. http://onlinelibrary.wiley.com/doi/10.1002/stc.1899/abstract* (published online).

[11] Jin, C., **Jang, S.***, Sun, X., Li, J., Christenson, R. (2016) "Damage detection of a full-scale highway bridge under severe temperature changes using state-space-aided machine learning", *Journal of Civil Structural Health Monitoring*, 6: 545-560. http://link.springer.com/article/10.1007/s13349-016-0173-8.

[12] **Jang, S.***, Dahal, S. (2015) "Full-scale application of Stochastic DLV method for highway bridge health monitoring", *Advances in Structural Engineering*. 18(11): 1875-1885.

[13] Quinones, M.M., Montejo, L.*, **Jang, S.** (2015). "Experimental and numerical evaluation of wavelet based damage detection methodologies." Int. J. Adv. Struct. Eng. DOI 10.1007/s40091-015-0084-7.

[14] Eskew, E., **Jang, S.*** (2014). "Damage Assessment of a Building subjected to a Terrorist Attack." *Advances in Structural Engineering* 17(11)1963-1704.

[15] **Jang, S.***, Dahal, S., Li, J. (2013). "Rapid full-scale expansion joint monitoring using wireless hybrid sensor." *Smart Structures and Systems,* 12 (3-4) 415-426.

[16] Li, J., **Jang, S.***, Tang, J., (2012). "Design of Biomorph Piezoelectric Energy Harvester for Railway Monitoring." *Journal of Korean Society for Nondestructive Testing,* 32(6): 661-668.

[17] **Jang, S.**, Sim, S.H., Jo, H., Spencer, B.F., Jr.* (2012). "Full-scale Experimental Validation of Decentralized Damage Identification Using Wireless Smart Sensors." *Smart Materials and Structures, 21, 115019*.

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

[19] **Jang, S.**, Spencer, B.F.*, Jr., Sim, S.H. (2012). "A Decentralized Receptance-based Damage Detection Strategy for Wireless Smart Sensors." *Smart Materials and Structures, 21, 055017*.

[20] **Jang, S.,** Spencer, B.F.*, Jr., Rice, J.A., Wang, Z. (2011). "Structural Monitoring of a Historic Truss Bridge using a Wireless Sensor Network." *Advances in Structural Engineering* 14(1): 93-101.

[21] Rice, J.A., Mechitov, K., Sim, S.H., Nagayama, T., **Jang, S.**, Kim, R., Spencer, B.F., Jr.*, Agha, G., and Fujino, Y. (2010). "Flexible Smart Sensor Framework for Autonomous Structural Health Monitoring." *Journal of Smart Structures and Systems,* 6(5): 423-438.

[22] **Jang, S.**, Jo, H., Cho, S., Mechitov, K., Rice, J.A., Sim, S.H., Jung, H.J., Yun, C.B., Spencer, B.F., Jr.*, and Agha, G. (2010). "Structural Health Monitoring of a Cable-stayed Bridge using

Smart Sensor Technology: Deployment and Evaluation." *Journal of Smart Structures and Systems,* 6(5): 439-460.

[23] Cho, S., Jo, H., **Jang, S.**, Park, J., Jung, H.J., Yun, C.B., Spencer, B.F., Jr.*, Seo, J.W. (2010). "Structural Health Monitoring of a Cable-stayed Bridge using Smart Sensor Technology: Data Analysis." *Journal of Smart Structures and Systems*, 6(5): 461-480.

[24] Sim, S.H., **Jang, S.**, Spencer, B.F.*, Jr. and Song, J. (2008). "Reliability-based Evaluation of the Performance of the DLV method." *Probabilistic Engineering Mechanics,* 23: 489-495.

* indicates the corresponding author

CONFERENCE PUBLICATIONS

[1] Fils, P.D. and **Jang, S.** (2020). "Wireless crack detection of a concrete building using low-cost RFID tags." *Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems 2020*, Proceedings Volume 11379, https://doi.org/10.1117/12.2556764, Event: SPIE Smart Structures + Nondestructive Evaluation, 2020, Online Only, California, United States

[2] Martinez-Castro, R.E., **Jang. S.** (2018). "Development and Evaluation of Commercial Radio Frequency Identification-Based Crack Sensors" Transportation Research Board 97th Annual Meeting, AFF20 Steel Bridges Standing Committee meeting. Paper number: 18-05075.

[3] Eskew, E., **Jang, S**. (2017). "Optimal sensor placement for parameter estimation of bridges." *SPIE Smart Structures and Materials + Nondestructive Evaluation and Health Monitoring, Paper number: 10170-92.*

[4] Meany, S., Eskew, E., Martinez-Castro, R., **Jang, S.** (2017). "Automated vehicle counting using image processing and machine learning." *SPIE Smart Structures and Materials + Nondestructive Evaluation and Health Monitoring, Paper number: 10170-124.*

[5] Martinez-Castro, R., **Jang, S.**, Nicholas, J. (2017). "Experimental performance evaluation of commercial RFID tags for crack detection." *Transportation Research Board 96th Annual Meeting*.

[6] Martinez-Castro, R., **Jang, S.**, Christenson, R. (2016). "Rapid cable tension estimation using dynamic and mechanical properties*." SPIE Smart Structures and Materials+ Nondestructive Evaluation and Health Monitoring*, 98030E.

[7] Jin, C., **Jang, S.**, Sun, X., Jiang, Z., Christenson, R. (2016). "Extended Kalman filter based structural damage detection for MR damper controlled structures." *SPIE Smart Structures and Materials+ Nondestructive Evaluation and Health Monitoring*, 98031T.

[8] Eskew, E., **Jang, S.**, Bertolaccini, K. (2016). "Progressive collapse analysis using updated models for alternate path analysis after a blast." *SPIE Smart Structures and Materials+ Nondestructive Evaluation and Health Monitoring*, 98033Y.

[9] Eskew, E., **Jang, S.**, (2015). "Rapid condition assessment of structural condition after a blast using state-space identification." *Proceedings of SPIE, Sensors and Smart structures Technologies for Civil, Mechanical, and Aerospace Systems 2015, San Diego, CA*. vol9437, 94372B.

[10] Jin, C., Li, J., **Jang, S.**, Sun, X., Christenson, R. (2015). "Structural damage detection for in-service highway bridge under operational and environmental variability." *Proceedings of SPIE, Sensors and Smart structures Technologies for Civil, Mechanical, and Aerospace Systems 2015*, San Diego, CA. vol9435, 94353A.

[11] Jin, C., **Jang, S.**, Sun, X., Jiang Z. and Christenson R. (2015), "Application of MR damper in real-time structural damage detection using extended Kalman filter," *in Proceedings of the Joint 6th International Conference on Advances in Experimental Structural Engineering (6AESE) and 11th International Workshop on Advanced Smart Materials and Smart Structures Technology (11ANCRiSST)*, Champaign, IL.

[12] Jin, C., **Jang, S**. and Sun, X. (2015), "Structural damage detection using extended Kalman filter combined with statistical process control in nonlinear systems," *in Proceedings of the 10th*

International Workshop on Structural Health Monitoring 2015: System Reliability for Verification and Implementation, vol. 2, pp. 2439-2446, DEStech Publications, Inc.

[13] Jin, C., **Jang, S**. Sun, X. (2015). "Structural damage detection using extended Kalman filter combined with statistical process control." Proceedings of SPIE, Sensors and Smart structures Technologies for Civil, Mechanical, and Aerospace Systems 2015, San Diego, CA. vol 9435, 94352K.

[14] Martinez-Castro, R., Eskew, E., **Jang, S**. (2014) "Experimental validation of a modal flexibility-based damage detection method for a cyber-physical system." Proceedings of SPIE, Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems 2014, San Diego, CA. vol 9061, Article number 90612E.

[15] Li, J., **Jang, S.**, Tang, J. (2014) "Implementation of a Piezoelectric energy harvester in railway health monitoring." Proceedings of SPIE, Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems 2014, San Diego, CA. vol 9061, Article number 90612Q.

[16] Eskew, E., **Jang, S.** (2013). "Damage assessment of a building subjected to a terrorist attack." 9th International Workshop on Advanced Smart Materials and Smart Structures Technology (ANCRiSST).

[17] Jin, C., **Jang, S.,** Dahal, S., Esmaili Zaghi, A. (2013). "Vibration-based lifetime assessment for building piping systems." 9th International Workshop on Advanced Smart Materials and Smart Structures Technology (ANCRiSST).

[18] **Jang, S.**, Dahal, S., Li, J., (2013). "Full-scale validation of wireless hybrid sensor on an in-service highway bridge." SPIE Smart Structures/NDE (CD-ROM)

[19] Li, J., **Jang, S.**, Tang, J., (2013). "Optimization of Piezoelectric energy harvester for wireless smart sensors in railway health monitoring." SPIE Smart Structures/NDE (CD-ROM)

[20] Mensah-Bonsu, P., **Jang, S.** (2013). "Long-term real-time structural health monitoring using wireless smart sensor." SPIE Smart Structures/NDE (CD-ROM)

[21] **Jang, S.**, Dahal, S. (2013). "Rapid Displacement Monitoring using Wireless Hybrid Sensor on an In-service Highway Bridge." Transportation Research Board, Annual Meeting.

[22] Li, J., **Jang, S.**, Zuba, M., Cui, J.H., Zhu, Y. (2012). "Feasibility of Underwater Sensor Networks for Lifetime Assessment of Offshore Civil Structures." OCEANS'12 MTS/IEEE.

[23] Montejo, L., Velazquez, L., Ramirez, R., **Jang, S.** (2012). "Performance of Wavelet and Hilbert-Huang transform in the identification of different levels of inelastic action of reinforced concrete structures subjected to seismic loads." 15th World Conference of Earthquake Engineering.

[24] Li, J., **Jang, S.,** Tang, J. (2012). "A Piezoelectric Based Energy Harvester for Railway Health Monitoring." ANCRiSST (CD-ROM).

[25] Mensah-Bonsu, P., **Jang, S**. (2012). "Multi-scale Model Updating of a Curved Highway Bridge." SPIE Smart Structures/NDE (CD-ROM).

[26] Li, J., **Jang, S.**, Tang, J. (2012). "Modeling and Analysis of a Bimorph Piezoelectric Energy Harvester for Railway Bridge Health Monitoring." SPIE Smart Structures/NDE (CD-ROM).

[27] Dahal, S., **Jang, S.**, Mensah-Bonsu, P. (2012). "Flexibility-based Damage Detection for In-service Highway Bridge." SPIE Smart Structures/NDE (CD-ROM).

[28] **Jang, S.**, Dahal, S., Contreras, G., Fitch, J., Karamavros, J., Bansal, R. (2012). "Hybrid Structural Health Monitoring for In-service Highway Bridge using Wireless Multi-scale Sensors." SPIE Smart Structures/NDE (CD-ROM).

[29] **Jang, S.**, Sim, S., Jo, H., Spencer, B.F. Jr. (2011). "Experimental Validation of Decentralized Damage Identification on a Historic Truss Bridge using Smart Sensors." ASEM+, International Conference of Smart Structures (Proceedings in press).

[30] Cho, S., Park, J-W., **Jang, S.**, Jo, H., Jung, H-J, Yun, C-B., Spencer, B.F. Jr. (2011). "Structural Health Monitoring using Wireless Smart Sensor Networks for a Cable-stayed Bridge." Computational Stochastic Mechanics.

[31] Scianna, A., **Jang, S.** (2011) "Model-free Modal Flexibility-based Damage Detection Strategy for In-service Highway Bridges." *SPIE Smart Structures/NDE* (CD-ROM)

[32] **Jang, S.**, Sim, S.H., Jo, H., Spencer, B. F. Jr. (2011) "Decentralized Full-scale bridge damage identification using wireless smart sensors." *SPIE Smart Structures/NDE* (CD-ROM).

[33] Nagayama, T., Jung, H.J., Spencer, B. F. Jr., **Jang, S.**, Mechitov, K. A., Cho, S., Ushita, M., Yun, C. B., Agha, G. A., Fujino, Y. (2010). "International Collaboration to Develop a Structural Health Monitoring System utilizing Wireless Smart Sensor Network and its Deployment on a Cable-stayed Bridge." 5th World Conference of Structural Control and Monitoring.

[34] Park, J. W., Cho, S., Jung, H.J., Yun, C. B., **Jang, S.,** Jo, H., Spencer, B. F. Jr., Nagayama, T., Seo, J.W. (2010). "Long-term Structural Health Monitoring System of a Cable-stayed Bridge based on Wireless Smart Sensor Networks and Energy Harvesting Techniques." 5th World Conference of Structural Control and Monitoring.

[35] Linderman, L. E., Rice, J. A., Barot, S., Spencer, B. F. Jr., Bernhard, J. T., **Jang, S.** (2010). "Experimental Characteristics of Wireless Communication Performance for Network Implementation." 5th World Conference of Structural Control and Monitoring.

[36] **Jang, S.**, Jo, H., Rice, J. A., Mechitov, K., Sim, S. H., Miller, T., Spencer, B. F. Jr., Agha, G. (2010). "Energy Efficient Autonomous Structural Health Monitoring System on a Cable-stayed Bridge." *The Fifth International Conference on Bridge Maintenance, Safety and Management*.

[37] Cho, S., **Jang, S.**, Jo, H., Park, J., Jung, H. J., Yun, C. B., Spencer, B. F. Jr. (2010). "Smart Wireless Sensor Network for Jindo Cable-stayed Bridge Monitoring Test-bed." *The Fifth International Conference on Bridge Maintenance, Safety and Management*.

[38] **Jang, S.**, Sim, S. H., Spencer, B. F. Jr. (2010). "Decentralized Bridge Health Monitoring using Wireless Smart Sensors." *Conference on Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems, SPIE Symposium on Smart Structures and Materials + Nondestructive Evaluation and Health Monitoring*.

[39] Cho, S., **Jang**, **S.,** Jo, H., Mechitov, K., Rice, J. A., Jung, H.J., Yun, C.B., Spencer, B.F. Jr., Nagayama, T., Seo, J. (2010). "Structural Health Monitoring System of a Cable-stayed Bridge using a Dense Array of Scalable Smart Sensor Network." *Conference on Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems, SPIE Symposium on Smart Structures and Materials + Nondestructive Evaluation and Health Monitoring*.

[40] Park, J. W., Kim, I. H., Jo, H., **Jang, S.**, Jung, H.J. (2010). "Feasibility Study of Wind Power Generator for Wireless Smart Sensor Node in Cable-stayed Bridge." *Conference on Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems, SPIE Symposium on Smart Structures and Materials + Nondestructive Evaluation and Health Monitoring*.

[41] Cho, S., **Jang, S.**, Jo, H., Park, J., Jung, H. J., Yun, C. B., Spencer, B. F. Jr., Nagayama, T. and Seo, J. W. (2009). "Cable-stayed bridge test-bed for long-term structural health monitoring using smart wireless sensor network." *International Conference on Computational Design in Engineering*.

[42] **Jang, S.**, Rice, J. A., Li, J., Jo, H., Spencer, B. F. Jr., Wang, Z. (2009). "Structural Monitoring of a Historic Truss Bridge using Wireless Sensor Network." *The Fifth international Workshop on Advanced Smart Materials and Smart Structures Technology.*

[43] **Jang, S.,** Spencer, B. F. Jr. (2009). "Receptance-based Structural Health Monitoring Approach for Bridge Structures." *Health Monitoring of Structural and Biological Systems III, 16th International Symposium on: Smart Structures and Materials & Nondestructive Evaluation and Health Monitoring, SPIE.*

[44] Nagayama, T., Ushita, M., Dinh, H. M., Fujino, Y., Spencer, B.F. Jr., Rice, J. A., **Jang, S.**, Mechitov, K. A., Agha, G. (2009) "Structural Health Monitoring System Development and Full-scale Bridge Vibration Measurement Using Smart Sensors." *10th International Conference on Structural Safety and Reliability (ICOSSAR)*.

[45] **Jang, S.,** Sim, S. H., Spencer, B. F. Jr. (2008). "Structural Damage Detection Using Static Strain Data, *World Forum on Smart Materials and Smart Structures Technology*, Chongqing and Nanjing, China. (6 pages in CD-ROM).

[46] Yun, C. B., **Jang, S.**, Sim, S. H., Lee, J. J. (2002). "Damage Detection Method for Bridge Structures using Hilbert-Huang Transform.", *Proceedings of Computer and Structural Engineering Institute of Korea*, Fall Conference, 453-458.

[47] Yun, C. B., **Jang, S.**, Sim, S. H. (2002). "Damage Location Method using Hilbert-Huang Transform: Theory and Simulation for Pier structures." *Proceedings of Earthquake Engineering Society of Korea*, Fall Conference.

[48] Shim, S. H., **Jang, S.**, Lee, J. J., Yun, C. B. (2002). "Damage Detection Method for Bridge Structures Using Hilbert-Huang Transform Technique." *Proceedings of The 2nd International Conference on Structural Stability and Dynamics*, Singapore.

TECHNICAL REPORTS

[1] Martinez-Castro, R., **Jang, S**. (2018). "Low cost wireless fatigue crack monitoring system using RFID arrays." Connecticut Cooperative Transportation Research Program, Report Number: JHR 18-330. http://www.ct.gov/dot/lib/dot/documents/dresearch/CCTRP_Report_JHR_18-330_Project_No._16-01.pdf

[2] Martinez-Castro, R., **Jang, S.** (2018). "Structural Cyber-Physical systems: a confluence of structural health monitoring and control technologies." *Articles.* Paper 2. http://opencommons.uconn.edu/cee_articles/2/

[3] Kolev, V., Christenson, R., Motaref, S., and **Jang, S.** (2016). "Development and evaluation of a dual purpose bridge health monitoring and weigh-in-motion system for a steel girder bridge – phase II" Report Number: CT-2271-F-15-10.

[4] **Jang, S.** and Spencer, B.F. Jr. (2015). "Structural health monitoring for bridge structures using smart sensors." Newmark Structural Engineering Laboratory report series, Report No. NSEL-035.

[5] Eskew, E., **Jang, S.**, (2012). "Impacts and Analysis for Buildings under Terrorist Attacks." *Articles.* Paper 1. http://digitalcommons.uconn.edu/cee_articles/1.

[6] **Jang, S**. (2003). "Comparative Study on Hilbert-Huang Transform and Wavelet Transform for Structural Damage Detection", Master thesis, Korea Advanced Institute of Science and Technology, Daejeon, South Korea, thesis advisor: Chung-Bang Yun.

[7] **Jang, S.** (2010). "Structural health monitoring for bridge structures using smart sensors." Doctoral dissertation, University of Illinois at Urbana-Champaign, Illinois, dissertation advisor: Billie F. Spencer, Jr.

PROFESSIONAL ACTIVITIES AND SERVICES

Member, Project Evaluation Panel, Transportation Research Board (TRB) – National Cooperative Highway Research Program (NCHRP) (2017 - present)

Panelist for National Science Foundation (2011, 2013, 2014)

Workshop Organization
Active Learning workshop, Center for Excellence for Teaching and Learning (CETL), 10 participants, May 2016,
Co-organized International Bridge Weigh-in-Motion workshop (with Richard Christenson and Sarira Motaref), Mystic, Connecticut, 38 participants, October 2015.

Member of International Committee
American Society of Civil Engineers (ASCE)
Transportation Research Board (TRB), Standing Committee on Steel Bridges Committee (AKB20)
American Society of Engineering Education

Friend of Committee
TRB, Standing Committee on Bridge Management (AHD35)
TRB, Standing Committee on Structures Maintenance (AHD30)
TRB, Standing Committee on Testing and Evaluation of Transportation Structures (AFF40)

Journal Reviewer
Mathematical Problems in Engineering
ASCE, Journal of Bridge Engineering
Advances in Structural Engineering
ASME, Journal of Dynamic Systems, Measurement, and Control
Computer-Aided Civil and Infrastructure Engineering
Engineering Optimization
International Journal of Decentralized Sensor Network
Journal of Civil Engineering, Korea Society of Civil Engineer
Journal of Earthquake Engineering
Journal of Nondestructive Evaluation
Journal of Structural Vibrations
Journal of Vibration and Control
Smart Structures and Systems
Structural Control and Health Monitoring
Transportation Research Board
Sensors

PROFESSIONAL DEVELOPMENT ACTIVITIES

Summer 2020 Concept Warehouse Workshop, Actively Engaging Students in Online Mechanical Engineering and Mechanics Courses, Oregon State University, July – August, 2020. Organized by Milo Koretsky.

ExCEEd Community Exchange, American Society of Civil Engineers, August 3-6, 2020. Participated as an ExCEEd workshop graduate.

Virtual Workshop on Redundancy in Bridges for Risk Mitigation in a Multi-Hazard Environment, July 21 and 28, 2020, American Society of Civil Engineers, Journal of Bridge Engineering, Federal Highway Administration Sponsored, Organized by Dr. Anil Agrawal (invited to break-out session).

Preparing for Distance Education, Certificate Program, Center for Excellence for Teaching and Learning, 5/29 – 6/4, 2020.

Exploring Online Learning (EOL) Short Course, Certificate Program, Center for Excellence for Teaching and Learning, 10/28 – 11/10, 2019.

Designing Your Hybrid/Blended Course, Certificate Program, Center for Excellence for Teaching and Learning, 3/21 – 3/28, 2019.

Olin College Virtual Summer Institute, Designing Student-Centered Learning Experiences, Workshops and Design Coaching, Boston, June 8-12, 2020. Participated as a team from Civil and Environmental Engineering department, team leader: Dr. Maria Chrysochoou

Disability Awareness & Inclusive Teaching Online Video Training, Department of Educational Psychology, University of Connecticut. May 2020.

National Institute for Undersea Vehicle Technology, Faculty Workshops, University of Connecticut, Avery Point, 2019 (multiple events)

Advising Conference, University of Connecticut, 2018, 2019

Faculty Teaching Workshop, University of Connecticut, 2016, 2017, 2018

Institute of Project-Based Learning, Worcester Polytechnic Institute, June 20-24, 2018. Participated as a team from School of Engineering, and representative from CEE department.

CAREER Proposal Workshop, Windsor Locks, Connecticut, June 2013

ASCE, Excellence in Civil Engineering Education (ExCEEd) Teaching workshop, United States Military Academy (WestPoint), New York, July 2012

Advances in Real-Time Hybrid Simulation Workshop, Lehigh University, October 2011

UNIVERSITY SERVICES

Chair, CEE Website and Brochure Committee (2017-2019)
Member, Community of Practice – Large Courses (2016 – present)
Member, Provost's Library Advisory Committee (2012 – present)
Member, CEE Website and Newsletter Committee (2010 – 2018)
Member, Faculty Search Committee (2010-2011, 2012-2013)
Member, CEE ABET and Course and Curriculum Committee (2011-2013)
Chair, CEE Department Seminar Committee (2011- 2013)