

## ZhiQiang Chen

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### **PROFESSIONAL BACKGROUND**

- **Visiting Scholar at University of California, Berkeley, Aug. 2019 to present. Academic host Professor Kenichi Soga**
  - Conduct collaborative research in robotic (unmanned) vehicles, innovative sensing network, AI, and pipeline and energy infrastructure monitoring.
- **Associate Professor (with tenure), University of Missouri - Kansas City, Sep. 2016 – present**
  - Doctoral faculty in Civil Engineering and Electrical & Computer Engineering at UMKC
- **Assistant Professor (tenure-track), University of Missouri - Kansas City, Sep. 2010 - Sept. 2016**
  - Doctoral faculty in Civil Engineering and Electrical & Computer Engineering at UMKC
- **Structural Engineer, China Aviation Planning and Design Institute, Beijing, China, Sept. 1997 – May 2001**
  - Conducted structural design for industrial buildings and facility, and computer-aided design (CAD) programming and development.

### **EDUCATION BACKGROUND**

- **Postdoctoral Fellow, University of California, San Diego, Jan. 2009 - Aug. 2010**
  - Research mentors and collaborators: Dr. Tara Hutchinson, Jon Bray, Bruce Kutter, and Andrew Whittaker. Training in Performance-based Earthquake Engineering with an emphasis in soil-structure interaction, physical centrifuge-based modeling, seismic city modeling, and nonlinear system identification.
  - Participated in an integral *centrifuge-based* geotechnical and structural testing project focusing on *structure-soil-structure interaction* (SSSI) and seismic effects at a city scale (<http://www.curee.org/projects/NCB/index.html>). Leading responsibilities include centrifuge model design, soil-foundation-structure modeling and simulation, nonlinear system identification, and finite-element model updating.
- **Ph.D., University of California, San Diego, 2009**
  - Doctoral Advisor: Tara Hutchinson; Co-advisor: Falko Kuester (Machine Vision)
    - Dissertation: *Identifying Structural Damage from Images* (<https://escholarship.org/uc/item/2ht846kz>). Pioneering research in development of advanced image understanding algorithms for understanding disaster-scenes and structural damage using

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remote sensing and high-speed imaging technologies.

### ➤ **M.S., Michigan Technological University, 2004**

- Thesis advisor: Theresa Ahlborn
  - Thesis: A Quantitative Analysis of Model Uncertainty for a Time-Step Prestress Loss Method.

### ➤ **B.S., Southeast University, Nanjing, China**

- Major in Civil Engineering; minor in Computer Science

## **ACADEMIC INTERESTS AND LEADERSHIP**

### ➤ **Research Interests**

- **Multi-hazard Infrastructure Resilience Engineering.** Physical and computational modeling of soil-structure and soil-fluid-structure systems; quantification of structural performance with uncertainties; and objective assessment of infrastructure asset and network resilience.
- **Artificial Intelligence Engineering.** Development of AI-enabled theory and methods for cognitive remote sensing, machine vision, system identification, and crowdsourcing.
- **Advanced Sensing for Monitoring Physical Infrastructure.** Use of advanced imaging, machine vision, and networked sensing for applications in infrastructure monitoring, disaster response, smart city, and precision agriculture.

### ➤ **Teaching Interests**

- Structural mechanics: Structural / Material Mechanics; Dynamics of Structures; Matrix and Finite-element Methods; Continuum Mechanics; and Soil-structure Interaction Analysis
- Engineering Mathematics, Engineering Probability and Reliability
- Introduction to Artificial Intelligence / Machine Vision / Machine Learning for Civil Engineers

### ➤ **Director of the Disaster, Infrastructure, and Geo-Intelligence Technology (DIGIT Lab) at UMKC (<http://info.umkc.edu/digitlab>), Sep. 2010 - present**

### ➤ **Director of UMKC Provost's [Strategic Initiative for Big Imaging and Smart City Technologies](#), Sep. 2016 – Sept. 2019.**

- Led a group of five faculty colleagues (Civil Engineering, Mechanical Engineering, Electrical Engineering, and Computer Science) in exploring big data, imaging, robotics, and artificial intelligence and their applications in smart cities; missions include (1) engagement of the Greater Kansas City's civil infrastructure, construction, and smart city industries and authorities; (2) K-12 STEAM outreach and smart-city technology education.

### ➤ **Organizer for the UMKC's Initiative on *Center for Connected Robotics***

- Led a group of five faculty colleagues (Civil Engineering, Mechanical Engineering, Electrical Engineering, and Computer Science) towards developing the next-generation connected and robotic vehicles that couple aerial and ground vehicles and realize cognitive remote sensing for critical missions.

### ➤ **Professional Communities with Key Contribution**

- Core member of ASCE's IRD Committee of Emerging Technologies and ASCE's EMI Committee

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of Objective Resilience, and participated in initiatives, monograph planning, and editorial activities.

### **INDUSTRIAL INTEREST AND ENTREPRENEURIAL EXPERIENCE**

- Interest and Invention Areas
  - Unmanned aerial vehicles, artificial intelligence, machine vision, and solution customization for construction, infrastructure, agriculture, logistics, and defense
- Co-founder and CSO, Aware Vehicles Inc., Jun 2017 - present
  - Aware Vehicles provides AI-enabled situational awareness, high-throughput imaging, and autonomous vehicles technologies to civil infrastructure, precision agriculture, and defense (<https://www.awarevehicles.com/>).
  - News coverage: “[Aware Vehicles accelerates pilot-free drone development thanks to IgniteX partnership with Black & Veatch](#)”; “[It’s showtime for 20 tech entrepreneurs at LaunchKC](#)”; “[Aware Vehicles, UMKC partner to develop Unmanned Aerial Vehicle automation](#)”.

### **RESEARCH PROJECTS**

#### ➤ **Pending Proposals for External Funding**

- 1) NSF CMMI (HDBE and EDSE)
- 2) Pacific Earthquake Engineering Research Center 2019
- 3) Currently 3+ SBIR submitted to NSF, USDA and DOD.

#### ➤ **Externally Funded (Current/Completed) Projects**

- 1) NASA, *Advancing Access to Global Flood Modeling and Alerting*, \$1,407,378 (UMKC \$178,000), 09/01/2019 ~ 08/31/2023.
  - Role in the project: Co-PI
  - Collaborating with seven universities, national labs, and private sectors to develop the generation remote sensing-based flood disaster resilience platform. Lead development in deep learning assisted remote sensing-based loss assessment.
- 2) **NSF SBIR**, *Situational Awareness in Autonomous Agriculture*, \$225K, 09/1/2018-02/28/2019
  - Role in the project: UMKC lead PI.
  - Development of autonomous and connected vehicle platform and high-throughput imaging technologies towards artificial intelligence (AI) assisted precision farming
- 3) **US DOT SBIR**, *High-Spatial- and Hyperspectral-Resolution Imaging for Bridge Inspection*, \$150K, 09/1/2018-01/31/2019
  - Role in the project: UMKC lead PI.
  - Development of high-speed and high-throughput imaging, robotic vehicles and edge-computing technologies for automating integrated structural health monitoring and condition inspection for civil infrastructure systems
- 4) **NSF**, Center for Big Learning (<http://nsfcbl.org/>). NSF Center for Big Learning (CBL) is a newly founded national center under the auspices of the IUCRC Program of NSF. The vision of the

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Center is to create intelligence and leverage collective wisdom from academia, industry, and governments. The CBL consortium focuses on large-scale deep learning (DL), intelligent platforms, and DL-enabled big data applications in a broad spectrum of disciplines. UMKC is a CBL site center (<https://info.umkc.edu/NSF-CBL/>).

- Role in the project: senior personnel at UMKC site center, and in charge of intelligent systems applications and coordination in civil infrastructure, construction, and transportation industries Kansas City.
- 5) **NSF, *Missouri Transect: Development of Aerial-Ground Sensing and Data-enabled Vulnerability-Resilience Modeling for Crop Systems subject to Drought***, \$75k, 01/01/2017 - 12/31/2017.
- Role in the project: sole-PI
  - This SEED project aims to prove the feasibility of evaluating crop system's water vulnerability and resilience through a novel sensing and modeling framework. Ongoing work has extended the analytic resilience modeling to community-based social / infrastructure / economic resilience modeling, and theoretical foundation for development of aerial-ground sensing networks.
- 6) **USDA, *NIFA-BARD Collaborative: Rapid Hydrophobicity Sensing and Computing through MAV-based Hyperspectral Imaging***, PI, \$148,995, 08/01/2015-03/31/2018.
- Role in the project: PI; collaborate with Professors Eyal Ben-Dor and Rony Wallach at Israel in development of rapid drone-based hyperspectral imaging and computing methods for monitoring and analyzing soil hydrophobicity.
  - To develop the next-phase USDA CAP grant in response to local, national and global water crisis and other disasters in agriculture (e.g. wildfire and mudflow) due to climate changes.
- 7) **Transportation Research Board, *Assessing, Coding, and Marking of Highway Structures in Emergency Situations***, \$31,000, 10/2013-10/2015 (Prime: Oregon State University)
- Role in the project: co-PI; collaborate with Oregon State, Merrimack and industry partners in developing the first national transportation structures assessing, coding and marking technologies and guidelines.
  - Principally in charge of smart app development and guidelines for transportation structures assessing, coding and marking.
- 8) **NASA, *Enhancing E-DECIDER with Loss and Damage Estimation Capability***, \$30,000 (<http://e-decider.org/>), 10/2013-10/2015 (Prime: Jet Propulsion Lab, NASA).
- Role in the project: Co-PI; collaborate with NASA/JPL, UC Davis, Indiana University, ImageCat, Inc. and national/local (mainly California) stakeholders in emergency responses in developing remote sensing-based damage detection, damage mapping, mobile cloud computing, and crowdsourcing innovations.
  - Ultimately the research team aims to develop the next-generation earthquake forecasting, preparedness and response decision-making gateways based on geophysics, remote sensing, and

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crowdsourcing-based technologies.

- 9) **NASA**, *High-level Understanding and Real-time Computing of Remotely-Sensed Very-High-Resolution Images for Built Environment Monitoring and Disaster Assessment*, \$50,000, 10/2012-08/2014.
  - Role in the project: sole-PI; explore and develop new disaster scene understanding algorithms ('disaster object bank').
- 10) **Microsoft Azure**, *Internet of Things: Aerial-Ground Networked Sensing and Azure Cloud for Assessing Crops System Resilience to Drought*, \$20K (as IoT Cloud sponsorship); 01/01/2017-12/31/2017
  - Role in project: sole-PI.
  - This project will compensate the need of the PI's Transect project and Empower that focuses on development of a IoT framework for crop / community systems monitoring and mobile-cloud resilience analytics.

### ➤ **Internally Funded Competitive Projects**

- 11) **UMKC Strategic Funds**, *UMKC Center for Big Imaging and Smart City Technologies*, \$200K, 01/01/2017 - 12/31/2018.
  - Role in project: PI; collaborative with Co-PIs / Professors Yugi Lee, Zhu Li, Travis Fields, Ceci Halman, and Alexis Petri
  - The goal of this Initiative is to establish a collaboratory – a center for UMKC faculty and students, industry, local government, and K-12 education to collaborate on applying big data and big imaging to opportunities for complex problems arising from realizing smart cities. In two years, we will (1) develop evidential collaboration with KC-based civil infrastructure industries and government partners; (2) influence underrepresented K-12 students through creative outreach projects; and (3) build high-quality and competitive research infrastructure for external funds.
- 12) **Missouri Extension**, *Empowering communities with smart drone networks for resilient disaster response*, \$20K, 01/01/2017 - 12/31/2017.
  - Role in project: sole-PI; collaborative with Missouri Extension field faculty and county officials
  - This project aims to develop an innovative and actionable community-based disaster response and broader-impact model through community outreach, training and education, and development of an innovative cyber-physical-social system (see illustration in the right).
- 13) **University of Missouri Research Board**, *Design-oriented Scoured Foundation Modeling*, \$25,900, 1/2011-8/2012.
  - Role in the project: sole-PI; explore and develop multi-hazard probabilistic soil-structure bridge system assessment considering flood/tsunami induced scour; develop flume-based soil-structure system monitoring and identification.
- 14) **University of Missouri System's Interdisciplinary Inter-Campus Award**, *Development and*

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*Application of a Hybrid Material Point and Immersed Finite Element Method (MPM-IFE) to Soil-Water Flow Modeling Considering Hydrophobicity*, \$59,400, 08/2015 - 07/2016.

- Role in the project: PI; collaborated with Dr. Xiaoming He at Missouri University of Science and Technology.
- This project aims to develop a novel computational approach to soil-water modeling considering surface hydrophobicity. Delivered products include a Python toolbox for Lattice Boltzmann Method and a MATLAB-based toolbox for Material Point Method.

### ➤ **Internally Funded Non-competitive Project**

15) **UMKC Toyota Research Initiation**, *Social Justice in Smart Energy*, \$5,000, 08/2011-08/2012.

- Role in the project: co-PI; development of mobile machine-vision apps for smarter energy analytics and home automation.

### ➤ **Internationally Funded Competitive Projects**

16) DAAD Worldwide Grant for one visiting student, Mr. Florian Klose. Research topic: *Stereo*

*imaging and implementation of FPGA-based embedded machine vision*, 06/01/2017 ~ 09/01/2017

17) DAAD Worldwide Grant for one visiting student, Ms. Alina Klerings. Research topic:

*Autonomous captioning for disaster scenes*, 06/01/2019 ~ 09/01/2019

### ➤ **Non-Funded Research Projects**

- The following research projects were conducted by student researchers in my labs, which have all yielded technical publications or significant deliverables. Projected undertaken by undergraduate students were mostly registered as CE400 Problem (Independent Study).

- Vertical and horizontal seismic and soil-structure interaction effects on Earth Covered Magazines (collaborator: Mr. Harold Sprague, Principal Technical Consultant at Parsons; Prativa Sharma, doctoral student, 2017).
- Deep learning of disaster-scene imagery database construction (Mallory Tackett, undergraduate student in physics, 2015).
- Building-integrated photovoltaics (BIPV) aided by multi-view drone imaging and 3D scene reconstruction (Leonardo Bueno, visiting undergraduate student from Brazil, 2015).
- Smart app for crowdsourcing based rain-garden assessment (Bhargava Gellaboina, graduate student in Computer Science, 2015).
- Smart app for disaster scene crowd-sensing and crowd-computing – an innovative app for disaster damage crowdsourcing (Avinash Desireddy, graduate student in Computer Science, 2014).
- Seismic damage survey in the aftermath of the 2014 South Napa Earthquake using drone-based aerial imaging and mobile-cloud disaster application (Jianfei Chen, summer 2014). A crowdsourcing campaign has been organized for seismic fault rupture recognition in vineyards (<http://goo.gl/RtiDNT>), which has attracted more than 4000 views in a week.
- Global disaster scene imagery database; undergraduate researcher (Ashlee Warnke,

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- undergraduate student in Civil Engineering, 2013)
- Flume testing and system identification of a self-vibrating progressively scoured model structure (undergraduate researcher, Ryan Holmes, 2012)
- Bathymetric bridge scour point cloud processing and integrated building information modeling; undergraduate researcher (Isaac Somogie, undergraduate student in Civil Engineering, 2011)
- Tower-line systems simulation and geospatial risk assessment subjected to combined hurricane winds and storm surges; undergraduate researcher (Ryan Holmes, 2011)

## **PUBLICATIONS**

### ➤ **Citations Index and Researcher ID**

- Google Scholar: <https://scholar.google.com/citations?hl=en&user=DY58wUoAAAAJ>.
- ORCID: <http://orcid.org/0000-0002-0793-0089>.

### ➤ **White Papers (non-peer reviewed)**

- W6. Aerial-Ground Robotic Quarry Mineral Assessment System; submitted to a private sector.
- W5. BIM-AI: Development of Big Imaging and Artificial Intelligence Technologies for Construction Monitoring and Integration with Building Information Modeling; submitted to a private sector.
- W4. Engineering for Every Drops: Development of an Aerial Hyperspectral Imaging and Ground Sensing Network Prototype; submitted to University of Missouri System.
- W3. Autonomous Connected Vehicles and Cognitive Remote Sensing (ACVCRS) for Critical Missions; submitted to University of Missouri System.
- W2. Empowering Rural Emergency Management through Collaborative Mobile-Cloud Crowdsourcing and Real-time Analytics; submitted to Missouri Extension.
- W1. Development of Aerial Robotics Infrastructure for Highway Infrastructure Monitoring and Rapid Response; submitted to Missouri Department of Transportation.

### ➤ **National Research Reports**

- R04. Olsen, M., Barbosa, A., **Chen, Z.**, Veletzos, M., Roe, G., and Tabrizi, K. (2016) Assessing, Coding, and Marking of Highway Structures in Emergency Situations ([NCHRP Project 14-29 Final Report](#)).

### ➤ **Disaster Reconnaissance Data Reports**

- R03. Sutley, E., Lequesne, R., Li, J., Kirkham, W., Chen, Z., Al-Sabawy, A., Daniel, L., Enderami, S. A., Kim, J., Mudaliar, T., Taher, S., Sharma, P., and Roueche, D. (2019). “StEER - 28 May 2019 Linwood, KS EF4 Tornado: Field Assessment Structural Team (Fast) Early Access Reconnaissance Report (EARR).” DesignSafe-CI (<https://doi.org/10.17603/ds2-xz1j-nm14>).
- R02. Yan, G., Chen, Z., et al.. (2019). “StEER - 22 May 2019 Jefferson City, MO EF3 Tornado: Field Assessment Structural Team (Fast) Early Access Reconnaissance Report (EARR)”. DesignSafe-CI; in preparation.

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R01. Koehler, R., Chen, Z., et al. “Geotechnical Engineering Reconnaissance of the 30 November 2018 M7.0 Anchorage, Alaska Earthquake, Phase II Report”. In preparation.

### ➤ **Book Chapters**

B03. **Chen, Z.**, Glasscoe, M.T., Eguchi, R., Huyck, C., and Kar, Bandana (2018). Roles of Remote Sensing Technologies in Disaster Resilience. To appear in Objective Resilience Primer Manual of Practice (ASCE Objective Resilience Committee, editor: Mohammad Ettouney).

B02. Guo, X., Dai, Z., & **Chen, Z.** (2019). Multi-Hazard Assessment of Seismic and Scour Effects on Rural Bridges with Unknown Foundations. In Earthquakes-Impact, Community Vulnerability and Resilience. IntechOpen (DOI: 10.5772/intechopen.85158).

B01. Glasscoe, M.T., Parker, J.W., Wang, J., Pierce, M.E., Yoder, M.R., Eguchi, R.T., Huyck, C.K., Hu, Z., Bevington, J., Ghosh, S., Gill, S., **Chen, Z.**, and Rosinski, A. (2016). Applications of E-DECIDER Decision Support Tools for Disaster Response and Recovery, Chapter 35 in Applied Geology in California, editor: Robert Anderson.

### ➤ **Journal Papers in Progress**

(Note for annotation: my name, **Chen, Z.** in bold; \* marks corresponding author; and my current or former students or research associates are underscored)

J40. Aryal, S., **Chen, Z.\*** and Tang, S. (2019). “Snapshot-hyperspectral Imaging and Detection of Complex Surface Damage.” ASCE Journal of Computing in Civil Engineer. In preparation.

J39. **Chen, Z.\*** and Chavakula, V. (2019). “Imprecise Naïve Credal Classification with Missing Values and Engineering Application.” Computer-Aided Civil and Infrastructure Engineering. In preparation.

J38. Sharma, P., **Chen, Z.\***, and Sprague, O. H. (2019). “Nonlinear Vertical-Horizontal Seismic Assessment of Earth Covered Magazines”. ASCE Journal of Performance of Constructed Facilities. In preparation.

J37. Sharma, P. and **Chen, Z.\*** “Nonlinear Optimization of Resilience Measurement for Rural Power Distribution Infrastructure”. Reliability Engineering & System Safety. In preparation.

J36. Sharma, P. and **Chen, Z.\*** “Quantitative Resilience Measures for Power Distribution Structures”. ASCE-ASME Journal of Risk and Uncertainty in Engineering. In preparation.

J35. Badroddin M. and **Chen, Z.\*** (2019). “Multi-Hazard and Probabilistic Understanding of Seismic and Scour Effects on Bridges: A Critical Synthesis and Assessment”. Journal of Earthquake Engineering. Under review.

J34. Guo, X. and **Chen, Z.\*** (2019). “Dynamic Performance and Damage Evaluation of a Scoured double Pylon Cable-Stayed Bridge under Ship Impact.” Engineering Structures. Under review.

J33. Guo, X. and **Chen, Z.\*** (2019). “Mainshock-integrated Aftershock Vulnerability Assessment of Bridge Structures.” Bulletin of Earthquake Engineering. Under review.

J32. Tang, S. and **Chen, Z.\*** (2019). “Machine Understanding of Disaster-Scene Mechanics”. IEEE Journal



or Selected Topics in Applied Earth Observations and Remote Sensing. Under review.

J31. Tang, S. and **Chen, Z.\*** (2019). “Scale-space Data Augmentation for Deep Transfer Learning of Structural Cracks”. *Journal of Nondestructive Evaluation*. Under review.

➤ **Refereed Journal Papers**

J30. Sharma, P. and **Chen, Z.\*** (2019). “Probabilistic Resilience Measurement for Rural Electric Distribution System Affected by Hurricane Events”. *ASCE-ASME Journal of Risk and Uncertainty in Engineering*. In press.

J29. Guo, X., Chen, Z., and **Chen, Z.\*** (2019). “Nonlinear Dynamic Response and Assessment of Bridges under Barge Impact and Local Scour”. *ASCE Journal of Performance of Constructed Facilities*. In press.

J28. Chen, J. and **Chen, Z.\*** (2019). “Spatial Path-Energy Optimization for Unmanned Aerial Vehicles Operation in Aerial-Ground Networking.” *ASCE Journal of Computing in Civil Engineering*. In press.

J27. Chen, X., Wu, G., Hou, S., Fan, J., Dang, J., & **Chen, Z.\*** (2019). “Development of Tactile Imaging for Underwater Structural Damage Detection.” *Sensors*, 19(18), 3925.

J26. Chen, J., Z. Dai and Z. **Chen\*** (2019). “Development of Radio-Frequency Sensor Wake-Up with Unmanned Aerial Vehicles as an Aerial Gateway.” *Sensors* 19(5): 1047.

J25. Chen, J., **Z. Chen\*** and C. Beard (2018). “Experimental investigation of aerial–ground network communication towards geospatially large-scale structural health monitoring.” *Journal of Civil Structural Health Monitoring* 8(5): 823-832.

J24. Ni, F., Zhang, J.\*, and **Chen, Z.** (2018). “Deep Learning Enabled Quantitative Concrete Crack Assessment”. *Computer-Aided Civil and Infrastructure Engineering*. DOI: <https://doi.org/10.1111/mice.12421>.

J23. Ni, F., Zhang, J.\*, & **Chen, Z.** (2018). “Pixel-level crack delineation in images with convolutional feature fusion. *Structural Control and Health Monitoring*”. e2286. DOI: <https://doi.org/10.1002/stc.2286>.

J22. Guo, X., Badroddin, M., and **Chen, Z.\*** (2019). “Scour-dependent empirical fragility modelling of bridge structures under earthquakes.” *Advances in Structural Engineering*, 22(6), 1384-1398. DOI: <https://doi.org/10.1177/1369433218815433>.

J21. Chen, H., Li, K., Chu, Y.\*, **Chen, Z.**, Yang, Y., (2018). “A Dimension Splitting and Characteristic Projection Method for Three-Dimensional Incompressible Flow”. *Discrete and Continuous Dynamical Systems - Series B*. In press.

J20. Guo, X., Badroddin, M., and **Chen, Z.\*** (2017). “Applied methods for seismic assessment of scoured bridges: a review with case studies.” *Earthquakes and Structures, An International Journal*, Vol. 13, No.5.

J19. Zhai, C.\*, Kong, J., Li, S., and **Chen, Z.**, (2016). “Experimental and finite element analytical investigation of seismic behavior of full-scale masonry infilled RC frames.” *Journal of Earthquake Engineering*. DOI:10.1080/13632469.2016.1138171.

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- J18. Guo, X. and **Chen, Z.\*** (2015). “Lifecycle Multihazard Framework for Assessing Flood Scour and Earthquake Effects on Bridge Failure” ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A. 10.1061/AJRUA6.0000844.
- J17. Zhai, C.\*, Jiang, S., and **Chen, Z.** (2015). “Dimensional Analysis of the Pounding Response of an Oscillator Considering Contact Duration.” ASCE Journal of Eng. Mech., 141(4).
- J16. Zhai, C\*. H., Wen, W. P., Li, S., **Chen, Z.**, Chang, Z., & Xie, L. L. (2014). “The damage investigation of inelastic SDOF structure under the mainshock–aftershock sequence-type ground motions.” *Soil Dynamics and Earthquake Engineering*, 59, 30-41.
- J15. Chen, J. and **Chen, Z.\*** “Mobile Imaging and Computing for Intelligent Structural Damage Inspection. Advances in Civil Engineering.” Volume 2014 (2014), Article ID 483729.  
<http://dx.doi.org/10.1155/2014/483729>.
- J14. **Chen, Z.\***, Chen, J., Shen, F., and Lee, Y. (2013). “Collaborative Mobile-Cloud Computing for Civil Infrastructure Condition Inspection.” Journal of Computing in Civil Engineering, 10.1061/(ASCE)CP.1943-5487.0000377.
- J13. Beard, C., **Chen, Z. Q.**, Kumar, V.\*, Lee, Y., Leon–Salas, W. D., and Rao, P. (2013). “SAVEUS: SAVING Victims in Earthquakes through Unified Systems.” International Journal of Communication Networks and Distributed Systems, 10(4), 402-420.
- J12. **Chen, Z.\***, Trombetta, N.W., Hutchinson, T.C., Mason, H.B., Bray, J.D., and Kutter, B.L., (2013). “Seismic System Identification for Centrifuge-based Nonlinear Building Models.” Journal of Earthquake Engineering, Volume 17, No. 4, pages 469-496.
- J11. Chang, Z.\*, Zhai, C., **Chen, Z.**, Li, S. and Xie, Li., (2013). “Quantitative Identification of Near-Fault Pulse-like Ground Motions Based on Energy.” Bulletin of the Seismological Society of America; No. 5; Vol. 103; Pg. 2591-2603; DOI: 10.1785/0120120320.
- J10. Zhai, C.\*, Wen, W., **Chen, Z.**, Li, S., and Xie, L., (2013). “Damage Spectra for the mainshock-aftershock sequence-type ground motions.” *Soil Dynamics and Earthquake Engineering*, Volume 45, 2013, Pg.1–12.
- J9. Trombetta, N.W., Mason, H.B., **Chen, Z.**, Hutchinson, T.C.\*, Bray, J.D., and Kutter, B.L. (2013). “Nonlinear dynamic foundation and frame structure response observed in geotechnical centrifuge experiment.” *Soil Dynamics and Earthquake Engineering*; Volume 50, July 2013, Pages 117–133.
- J8. Mason, H.B., Trombetta, N.W., Bray, J.D.\*, **Chen, Z.**, Hutchinson, T.C., and Kutter, B.L. (2013). “Seismic soil–foundation–structure interaction observed in geotechnical centrifuge experiments.” *Soil Dynamics and Earthquake Engineering*, Volume 48, May 2013, Pages 162–174.
- J7. Olsen, M., **Chen, Z.**, Hutchinson, T.C.\* and Kuester, F. (2013). “Optical techniques for multiscale damage assessment.” *Geomatics, Natural Hazards and Risk*, Vol. 4, No. 1, pp. 49-70.

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- J6. **Chen, Z.** and Hutchinson, T.C.\* (2011). “Structural Damage Detection using Bi-temporal Optical Satellite Images.” *International Journal of Remote Sensing*, Vol. 32, No. 17, pp. 4973-4997.
- J5. **Chen, Z.** and Hutchinson, T.C.\* (2010). “Image-based Framework for Concrete Surface Crack Monitoring and Quantification.” *Journal of Advances in Civil Engineering*, doi:10.1155/2010/215295.
- J4. **Chen, Z.** and Hutchinson, T.C.\* (2009). “Probabilistic Urban Structural Damage Classification Using Bitemporal Satellite Images.” *Earthquake Spectra (EERI)*, Vol. 26(1), pp. 87-109.
- J3. **Chen, Z.** and Hutchinson, T.C.\* (2007). “Urban Damage Estimation Using Statistical Processing of Satellite Images.” *Journal of Computing in Civil Engineering, ASCE*, Vol. 21(3), pp. 187-199.
- J2. Hutchinson, T. C.\* and **Chen, Z.** (2006). “Improved Image Analysis for Evaluating Concrete Damage.” *Journal of Computing in Civil Engineering, ASCE*, Vol. 20(3), pp. 210-216.
- J1. Hutchinson T. C.\* and **Chen, Z.** (2005). “Optimized Estimated Ground Truth for Object-based Urban Damage Estimation Using Satellite Images.” *Earthquake Spectra (EERI)*, Vol.21 (S1), pp. s239-s254.
- **Conferences with Full Papers in Proceedings (\* marks the presenter)**
- C34. Klerings, A., Tang, S.\*, and Chen, Z. (2019). “Structuralizing Disaster-scene Data through Auto-captioning.” In 27th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems, Nov. 5 - 8, Chicago, IL. ACM, New York, NY, USA (<https://doi.org/10.1145/1122445.1122456>).
- C33. Aryal, S., Tang, S., and Chen, Z. (2019). “Learning structural damage through hyperspectral images.” 9th International Conference on Structural Health Monitoring of Intelligent Infrastructure. St. Louis, MO, USA.
- C32. Sharma, P.\*, Chen, Z. (2019). “Probabilistic Resilience Distance Measures and Application for Rural Power Distribution Systems”. ASCE Engineering Mechanics Institute Conference 2019, Pasadena, CA, USA.
- C31. Chen, Z.\*, and Guo, X. (2018). “Probabilistic multi-hazard assessment of seismic and scour effects on bridge structures.” 9th International Conference on Bridge Maintenance, Safety and Management, Melbourne, Australia.
- C30. Veletzos, M., Olsen, M. J., Barbosa, A. R., Burns, P., Chen, Z., Roe, G., and Tabrizi, K. (2018). “Assessing, Coding & Marking of Highway Structures in Emergency Situations.” 11th U.S. National Conference on Earthquake Engineering, Los Angeles, CA, USA.
- C29. Ni, F., Chen, Z., and Zhang, J.\* (2018). “Convolutional Neural Networks based Quantitative Crack Assessment.” 7th World Conference on Structural Control and Monitoring, Qingdao, China.
- C28. Chen, Z.\* and Tang, S. (2017). “Level-of-detail Assessment of Structural Surface Damage using Spatially Sequential Stereo Images and Deep Learning Methods.” The 11th International Workshop on Structural Health Monitoring, Stanford, CA, USA.
- C27. Sharma, P., Chen, Z. \*, Thiagarajan, G., Daly, J., and Sprague, H. (2017). “Vertical-horizontal Seismic

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Response of Earth-covered Partially-embedded Structures”. 3rd Huixian International Forum on Earthquake Engineering for Young Researchers, Urbana, IL, USA.

C26. Chen, H. and Chen, Z\*. (2016). “Lattice Boltzmann modeling of two-phase flows in complex porous media considering surface hydrophobicity”, The 6th International Conference on Applied Mechanics and Civil Engineering (AMCE 2016), Hong Kong, China.

C25. Chen, Z.\* (2015). Robotic Opportunistic Aerial-Imaging and Ground-Sensing Network for Use in Emergency Situations. 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.

C24. Chen, Z. and Guo, X. (2015). Multi-hazard Life-cycle Analysis of Flood-Scour Effects on Seismic Bridge Performance. Proceedings of the ASCE Structures Congress, Portland, Oregon.

C23. Guo, X. and Chen, Z. (2015). Response Modeling of Scoured Bridges under Near-Fault Ground Motions. Earth and Space 2014: pp. 632-641.

C22. Chen, Z. (2014). “A Micro-UAV Approach to Earthquake Disaster Scene Sensing and Proof-of-Concept Studies”, 10th U.S. National Conference on Earthquake Engineering, Anchorage, Alaska.

C21. Chen, Z. and Chen, J. (2014). “Collaborative Mobile-Cloud Disaster Scene Computing for Rapid Post-disaster Response”, 10th U.S. National Conference on Earthquake Engineering, Anchorage, Alaska.

C20. Homles, R., Chen, Z., Tripath, R., and Chen, J (2013). 1-g Scale Hydraulic Flume-based Soil-Fluid-Structure Model Testing and Evaluation of Surging and Scouring Effects. Structures Congress 2013: pp. 2394-2409.

C19. Chen, Z. and Chen, J. (2012). Collaborative Mobile Sensing and Computing for Civil Infrastructure Condition Assessment: Framework and Applications, International Symposium on Smart Structures and Materials & NDE and Health Monitoring, San Diego, CA, USA.

C18. Mason, H.B. and Chen, Z. (2012). Progressive simulation and performance assessment of soil-foundation-structure systems due to main-shocks and successive aftershocks, the 2012 NZSEE Annual Conference, Christchurch, New Zealand.

C17. Pang, W. and Chen, Z. (2012). Failure Risk of 230 kV Electricity Transmission Lines in South Carolina under Hurricane Wind Hazards, ATC & SEI Advances in Hurricane Engineering Conference, Miami, FL, USA.

C16. Chen, Z. and Guo, X. (2012). Numerical Investigation of Dynamic Properties of Scoured Shallow Foundation and Impact on Seismic Response of Structures. The 6th International Conference on Scour and Erosion, Paris, France.

C15. Swanson, E., Chen, Z. and Sprague, H. (2012). Seismic response characterization for raised access floor and equipment system considering horizontal and vertical ground motion, Structures Congress 2012,

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Chicago, IL, USA.

C14. Mason, H., Jones, K., Zupan, J., Bray, J., Trombetta, N., Hutchinson, T., Chen, Z., Choy, B., Puangnak, H., and Kutter, B. Examining Structure-Soil-Structure Interaction Using Dynamic Centrifuge Testing. Proceedings of 2011 NSF Engineering Research and Innovation Conference.

C13. Chen, Z., Derakhshani, R. R., Halmen, C., & Kevern, J. T. (2011). A texture-based method for classifying cracked concrete surfaces from digital images using neural networks. In Neural Networks (IJCNN), The 2011 International Joint Conference on (pp. 2632-2637). IEEE.

C12. Chen, Z., Raychowdhury P. and Hutchinson, T.C. (2010). Effects of Foundation Configuration Variation on Seismic Response of Moment-Frame Buildings, 19th Analysis & Computation Specialty Conference, Structures Congress 2010, Orlando, FL, USA.

C11. Mason, H.B., Chen, Z., Jones, K.C, Trombetta, N.W., Bray, J.D, Hutchinson, T.C., Bolisetti, C., Whittaker, A.S., Choy, B.Y, Kutter and Fiegel, G.L. (2010). Soil-Foundation-Structure-Interaction Effects of Model Buildings within A Geotechnical Centrifuge, Proceedings of 9th US National and 10th Canadian Conference on Earthquake Engineering, Toronto, Canada.

C10. Chen, Z., Hutchinson, T.C., Trombetta, Mason, H.B., Bray, J.D, Jones, K.C, N.W., Choy, B.Y, Kutter, B.L., Fiegel, G.L., Montgomery, J., Patel, R.J., Reitherman, R.D., Bolisetti, C. and Whittaker, A.S. (2010). Seismic Performance Assessment of Nonlinear Building-Foundation Systems in a Centrifuge Test, Proceedings of Fifth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, USA.

C9. Mason, H.B., Bray, J.D, Jones, K.C, Chen, Z., Hutchinson, T.C., Trombetta, N.W., Choy, B.Y, Kutter, B.L., Fiegel, G.L., Montgomery, J., Patel, R.J., Reitherman, R.D., Bolisetti, C. and Whittaker, A.S. (2010). Earthquake Input Motions and Seismic Site Response in Centrifuge Tests Examining SFSI Effects, Proceedings of Fifth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, USA.

C8. Chen, Z. and Hutchinson, T.C. (2008). Probabilistic Representation of Structural Integrity of Urban Buildings in Remotely Sensed Images. IEEE International Geoscience and Remote Sensing Symposium (IGARSS), Boston, MA, USA.

C7. Chen, Z. and Chang, B. and Hutchinson, T.C. (2008). Image-based Monitoring of Structural Damage: Concrete Surface Cracks, 15th International Symposium on Smart Structures and Materials & NDE and Health Monitoring, San Diego, CA, USA.

C6. Chen, Z. and Hutchinson, T.C. (2007). Application of PDE methods for Image-based Concrete Surface Damage Detection, 14th Annual International Symposium on Smart Structures and Materials & Nondestructive Evaluation and Health Monitoring, San Diego, CA, USA.

C5. Chen, Z. and Hutchinson, T.C. (2007). Probabilistic Classification Framework for Urban Structural Damage Estimation Using Satellite Images, 4th IEEE GRASS & ISPRS Joint Workshop on Remote Sensing

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and Data Fusion over Urban areas, Paris, France.

C4. Chen, Z. and Hutchinson, T.C. (2007). Empirical Evaluation of Dissimilarity Measures for Use in Urban Structural Damage Detection, IS&T/SPIE Symposium on Electronic Imaging Science and Technology, San Jose, CA, USA.

C3. Chen, Z. and Hutchinson, T.C. (2005). Urban Damage Estimation Using Statistical Processing of Satellite Images: 2003 Bam, Iran Earthquakes, IS&T/SPIE Symposium on Electronic Imaging Science and Technology, San Jose, CA, USA.

C2. Hutchinson, T.C., and Chen, Z. (2004). Statistical Methods Applied to Image Analysis for Improved Evaluation of Concrete Damage. NSF-ANCER Workshop, Oahu, HI, USA.

C1. Chen, Z. and Ahlborn, T.M. (2003). Statistical Analysis of Prestress Losses for Two HPC Girders. Proceedings of the 3rd PCI / FHWA International Symposium on High Performance Concrete (CD-ROM), Orlando, FL, USA.

## **TUTORIALS AND INVITED LECTURES**

L3. Tutorial, 2019. “DfV: Dynamics from Video –from imaging basics to recent advances”, EVACES, 2019, Nanjing, China (<http://www.evaces2019.com/About.aspx?ClassID=20;https://photos.app.goo.gl/VoWJkjk5zM5LmdH9>).

L2. Short-course lecture (five days), 2018. “Soil-structure Interaction: Theories, Analysis, and Applications”. Yangzhou University, Yangzhou, China.

L1. Tutorial, 2017. “Soil-structure interaction: historical development and recent advances”, Southeast University, Nanjing, China.

### ➤ **Other Conference Presentation (\*marks the presenter)**

O48. Chen, Z.\*, Sharma, P., Sutley, E.J. (2019). “Deep learning of Tornado Disaster Scenes using Unmanned-Aerial-Vehicle (UAV) Images.” 2019 AGU Fall Meeting, San Francisco, CA, USA.

O47. Sharma P.\* and Chen, Z. (2019). “Resilience Assessment on the Power Outage caused by Hurricane Harvey 2017.” ASCE Structures Congress, Orlando, FL, USA.

O46. Chen, Z.\* and Tang, S. (2018). “Crowdsourcing of Disaster Scenes and Understanding Using Deep Learning.” 2019 Annual American Association of Geographers Meeting, Washington DC, USA (invited panel member).

O45. Aryal, S.\*, Tang, S., and Chen, Z. (2018). “Image-based Damage Detection: from learning deeply to collecting deeply”, ASCE Engineering Mechanics Institute Conference 2018 (EMI 2018), Boston, MA.

O44. Veletzos, M.\*, Olsen, M. J., Barbosa, A. R., Burns, P., Chen, Z., Roe, G., and Tabrizi, K. (2018). “Assessing, Coding & Marking of Highway Structures in Emergency Situations.” ASCE Structures Congress, Fort Worth, TX, USA.

O43. Chavakula, V.\*, Chen, Z., and Sharma, P. “Learning and Assessing Objective Regional Resilience

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using Credal Networks.” ASCE Engineering Mechanics Institute Conference 2017 (EMI 2017), San Diego, CA.

O42. Chen, Z.\*, Chen, H., and Chu, Y. (2017). “Coupled MPM-LBM Pore-scale Modeling of Multi-phase Flow in Stressed Porous Media Considering Hydrophobicity.” ASCE Engineering Mechanics Institute Conference 2017 (EMI 2017), San Diego, CA.

O41. de Patoul, B.\*, and Chen, Z. (2017). “Post-wildfire Vegetation Loss Mapping using Bitemporal Synthetic Aperture Radar Images.” ASCE Engineering Mechanics Institute Conference 2017 (EMI 2017), San Diego, CA.

O40. Tang, S.\*, and Chen, Z. (2017). “Real-Time Hyperspectral Imaging and 4D Geospatial-Spectral Modeling of Civil Infrastructure and Materials.” ASCE Engineering Mechanics Institute Conference 2017 (EMI 2017), San Diego, CA.

O39. Tang, S\*. and Chen, Z. (2017). “Image-based Water Stress Detection: A Deep Learning Framework and Evaluation”, ASPRS Annual Conference - Imaging and Geospatial Technology Forum (IGTF 2017), Baltimore, MD, USA.

O38. Tang\*, S. and Chen, Z. (2017). “Detection of Complex Concrete Damage – A Deep Learning Framework and Performance Evaluation”, International Workshop on Computing for Civil Engineering (IWCCE) Seattle, WA, USA.

O37. Tang\*, S. and Chen, Z. (2017). “Demo: Real-Time Deep Learning-based Visual Identification of Concrete Damage with Complex Scenes”, International Workshop on Computing for Civil Engineering (IWCCE) Seattle, WA, USA.

O35. Tang, S\*. and Chen, Z. (2016). “Detection of Complex Concrete Damage form the Air – A Deep Learning Framework and Robotic Drone-based Prototyping”, the 5th Annual Transportation Infrastructure Conference, Rolla, MO.

O34. Kar, B.\* and Chen, Z. (2016). “Veracity of Structured and Unstructured Big Data – A Case Study of Emergency Management”. Oral presentation at the Annual Meeting of the ASPRS 2016 Annual Conference and co-located JACIE Workshop, Fort Worth, TX.

O33. Kar, B.\* and Chen, Z. (2016). “Big Data Quality - A Comparison of Structured and Unstructured Data During a Disaster”. Oral presentation at the Annual Meeting of the Association of American Geographers (AAG), San Francisco, CA.

O32. Chen J. and Chen, Z.\* (2016). “Energy-Efficient Aerial and Ground Sensing for Rapid Field Response”, 2016 Defense Innovation Summit, Austin, TX (poster presentation).

O31. Chen, Z.\*, Lee, Y., O’Bannon D., and Treese, L. (2016). “Smart Green Infrastructure for Smarter Kansas City”. IEEE Smart Cities, Kansas City, MO (poster presentation).

O30. Chen, Z\*., E. Ben-Dor, R. Wallach, J. Chen, H. Chen, S. Tang (2016). “Soil Hydrophobicity Sensing,

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Computing, and Modeling: An Interdisciplinary Framework”, AFRI-NIWQP Project Director Meeting, Washington D.C., 2016 (poster presentation).

O29. Glasscoe, M.\*, Pierce, M., Ludwig, L.G., Rundle, J., Eguchi, R., Chen, Z., Rosinski, A. (2016). Decision Support and Data Discovery for Improved Hazard Analysis and Disaster Response, UNISDR Science and Technology Conference, Geneva, Switzerland, 2016.

O28. Chen, Z.\* and Guo, X. (2016). PBSE-Bridge: Performance-based Scour and Earthquake Demand Analysis for River-Crossing Bridges. The Geotechnical and Structural Engineering Congress 2016, Phoenix, AZ.

O27. Chen, Z.\* (2016). From Satellite, UAV, to Smartphone-based Disaster Scene Understanding: A Critical Review of Computational Damage Detection Methods. The Geotechnical and Structural Engineering Congress 2016, Phoenix, AZ.

O26. Alabsi, M., Chen, J. and Chen, Z.\* (2015). Integrated UAV (drone) Imaging and SfM Computing for Rapid Detection of Seismic Rupture in the Aftermath of the 2014 South Napa Earthquake. 2015 SCEC Annual Meeting, Palm Spring, CA, USA.

O25. Glasscoe, M.\*, Donnellan, A., Parker, J., Grant, R., Lyzenga G., Pierce, M., Wang J. , Ludwig, L.G., Eguchi, R., Huyck, C., Hu, Z., Chen, Z., Yorder, M., Rosinski, A. (2015). Disaster Response Tools for Data Discovery and Decision Support – GeoGateway and E-DECIDER. 2015 SCEC Annual Meeting, Palm Spring, CA, USA.

O24. Glasscoe, M.\*, Donnellan, A., Parker, J., Grant, R., Lyzenga G., Pierce, M., Wang J. , Ludwig, L.G., Eguchi, R., Huyck, C., Hu, Z., Chen, Z., Yorder, M., Rosinski, A. (2015). Disaster Response Tools for Decision Support and Data Discovery - E-DECIDER and GeoGateway. 2015 AGU Annual Meeting, San Francisco, CA, USA.

O23. Chen, Z.\* (2015). Development of a Micro-UAV Hyperspectral Imaging Platform for Assessing Agricultural and Post-Wildfire Soil-Water Hazards. 2015 AGU Annual Meeting, San Francisco, CA (poster presentation).

O22. Chen, Z.\* and Bian, Y. (2015). PaveRank: Crowdsourcing and Cloud Computing towards Trustful Pavement Condition Ranking. 5th International Transportation Systems Performance Measurement and Data Conference, Denver, Colorado (invited panelist).

O21. Glasscoe, M.\*, Parker, J.W., Pierce, M.E., Wang, J., Eguchi, R.T., Huyck, C.K., Hu, Z., Chen, Z., Yoder, M.R., Rundle, J.B., and Rosinski A., (2015). Decision Support and Data Discovery Tools for Disaster Response – E-DECIDER & GeoGateway. SSA’s 2015 Annual Meeting.

O20. Glasscoe, M., Parker, J., Pierce, M., Wang, J., Eguchi, R., Chen, Z., Yoder, M., and Rosinski, A., (2014). E-DECIDER Rapid Response to the M 6.0 South Napa Earthquake, AGU Annual Fall Conference, San Francisco, CA.

O19. Glasscoe, M.\*, Parker, J., Pierce, M., Wang, J., Eguchi, R., Chen, Z., Yoder, M., and Rosinski, A.,



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- (2014). E-DECIDER Disaster Response and Decision Support Cyber-infrastructure: Technology and Challenges, AGU Annual Fall Conference, San Francisco, CA.
- O18. Tripathi, R.\* , Chen, Z. and Richardson, J. (2014). “Parametric Modeling of Soil-Structure Oscillators for Rapid Coastal Disaster Response”, ASCE Earth and Space Conference.
- O17. Chen, Z.\* , (2014). Mathematical Evidence-theoretic Framework for Information Fusion of Disaster Scene Big Data, AGU Annual Fall Conference.
- O16. Glasscoe, M.\* , Parker, J.W., Pierce, M.E., Wang, J., Eguchi, R.T., Huyck, C.K., Hu, Z., Chen, Z., Yoder, M.R., Rundle, J.B., and Rosinski A., (2014). E-DECIDER Disaster Response and Decision Support Platform. Southern California Earthquake Center Annual Meeting, Palm Spring, CA.
- O15. Chen, Z.\* and Bian, Y. (2014). “Emerging and Trustful Citizen Scientist Technologies for Disaster Data Collection and Mapping”, 2nd Integrated Research on Disaster Risk Conference, Beijing, China.
- O14. Chen, Z.\* and Guo, X. (2014). “Probabilistic Multi-hazard Fragility Framework for Bridge Structures Incorporating Earthquake and Scour”, GeoShanghai International Conference, Shanghai, China.
- O13. Chen, Z.\* (2013). Mobile-Cloud Crowdsourcing-enabled Image Understanding and GIS Fusion for Rapid Post-Disaster Response. CaGIS/ASPRS 2013 Specialty Conference, San Antonio, Texas.
- O12. Chen, Z.\* (2013). Multi-hazard Fragility Analysis of Tsunami-Scoured Coastal Bridges considering Aftershocks, ASCE EMI 2013, Chicago.
- O11. Bian, Y. and Chen, Z.\* (2013). Overview of Helical Pile and Grouted Helical Pile for Use in Wind Turbine. Structures Congress.
- O10. H. B. Mason\*, J. D. Bray, G. Fiegel, T. C. Hutchinson, B. L. Kutter, R. Reitherman, A. Whittaker, Z. Chen, B. Choy, & N. Trombetta. (2009). “NEESR-SG: Seismic Performance Assessment in Dense Urban Environments”, NSF CMMI Engineering Research and Innovation Conference 2009 & 2009 NEES 7th Annual Meeting”, Honolulu, Hawaii.
- O9. Chen, Z.\* (2012). “Seismic System Identification using Centrifuge-based Soil-Structure Interaction Test Data. Quake Summit, Boston (poster presentation).
- O8. Chen, Z.\* (2012). “Remote Sensing and GIS Integration for Disaster Impact and Civil Infrastructure”. UMKC GIS Symposium.
- O7. Guo, X.\* and Chen, Z. (2012). “Seismic Performance of Scoured Bridge Systems: Preliminary Findings”, EERI Annual Meeting (poster presentation).
- O6. Chen, Z.\* and Hutchinson, T.C. (2011). Characterization of Disaster Effects Using Satellite Imagery for A Coastal Town Struck By The 2010 Chile Tsunami, EERI Annual Meetings, San Diego, California (poster presentation).
- O5. Mason, B.\* , Chen, Z., Choy, B., Montgomery, J., Trombetta, N., Bray, J., Fiegel, G., Hutchinson, T., Kutter, B., and Whittaker, A. (2009). “NEESR-SG Project: Seismic Assessment in Dense Urban

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Environments.” (online presentation).

O4. Trombetta N.\* and Chen Z. (2009). The Shaking of a City Block – Seismic Performance in Dense Urban Environments, the 27th Jacobs School of Engineering Research Expo, UCSD (poster presentation).

O3. Chen, Z.\* (2008). Scale-Space Dissimilarity-based Urban Structural Damage Detection, IEEE International Geoscience and Remote Sensing Symposium (IGARSS), Boston, Massachusetts (invited poster presentation).

O2. Chen, Z.\* (2008). Post-disaster Urban Damage Analysis Using Remotely Sensed Images, the 27th Jacobs School of Engineering Research Expo, UCSD (poster).

O1. Chen, Z.\* (2008). Visual Computing-based Monitoring of Structural Damage, the 8th Annual All-Grad Research Symposium, UCSD (poster presentation).

## **PUBLIC TALKS, PANEL SPEECH, AND SEMINARS**

S31. Chen, Z. (2019). “Multi-hazard Bridge Assessment and Management – a transition from the performance-based to a resilience-based approach.”, Invited lecture at the Jiangsu Transportation Research Institute Company, Nanjing, China.

S30. Chen, Z. (2019). Panel member, “Leveraging Crowdsourcing, Citizen Science, & Social Media to Produce Volunteer Geographic Information (VGI) for Hazard Science, Disaster Research, & Emergency Management.” Organizer: Dr. Sophia B Liu. 2019 Annual AAG Meeting, Washington DC, USA.

S30. Chen, Z. (2019). “Multi-hazard Civil Infrastructure Resilience: from first-principles based to data-driven assessment.” Invited keynote for University of Missouri System: Road to Resilience – Disaster to Social and Environmental Resilience Summit.

S29. Chen, Z. (2018). “Development of Smart UAV Technologies for Structural Health and Disaster Monitoring.”. Invited seminar at the Southeast University, Nanjing, China.

S29. Chen, Z. (2018). “Soil Hydrophobicity Evaluation – from Remote Sensing Detection to Numerical Modeling.” Invited seminar at the Nanjing University of Agriculture, Nanjing, China,

S28. Chen, Z. (2017). “Aerial robotics for civil infrastructure inspection.” Invited talk for the Industrial Day for the Society of American Military Engineers, Greater Kansas City Post.

S28. Chen, Z. (2017). “Soil Hydrophobicity Evaluation –from Remote Sensing Detection to Numerical Modeling.” Invited seminar at the Hong Kong University of Science and Technology, hosted by Dr. Gang Wang.

S27. Chen, Z. (2016). “Probabilistic Multi-hazard Performance Modeling and Assessment for Bridge Structures”. Invited talk at the 2016 SEAKM, Kansas City, MO

S26. Chen, Z. (2015). “Civil Infrastructure Condition and Disaster Understanding: from Data-enabled to Big-Data Computing”, University of Nebraska, Lincoln, NE.

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- S25. Chen, Z. (2014). “Disaster Scene Big Data and Analytics for Disaster Resilience”. Colloquium in Department of Physics, UMKC.
- S24: Chen, Z. (2014). “Seminar: Disaster Resilience through Big-data Centric Technologies and Multi-hazard Modeling”. Ha’erbin Institute of Technology (HIT), Ha’erbin, China, <http://civil.hit.edu.cn/show.php?id=3957>.
- S23: Chen, Z. (2014). “Seminar: Life-Cycle Seismic Assessment of Scoured Bridge Systems and Big-data Enabled Disaster Resilience”. Xiamen University, Xiamen, China, <http://archt.xmu.edu.cn/articles.asp?aid=3564>.
- S22: Chen, Z. (2014). “Seminar: Disaster Resilience through Big-data Centric Technologies and Multi-hazard Modeling”. Institute of Engineering Mechanics, Ha’erbin, China Earthquake Administration. <http://www.cea.gov.cn/publish/dizhenj/984/100061/20140611104029676776213/>.
- S21: Chen, Z. (2014). “Seminar: Big-data Enabled Disaster Response for Climatic Disaster Resilience”. School of Atmosphere Sciences, Nanjing University, Nanjing, China, <http://as.nju.edu.cn/newDetial.aspx?MType=WZSY&MenuType=WZSY-KYDT&CI=20140605-09010896-c97a5145>.
- S20. Chen, Z. (2014). “Seminar: Disaster Resilience through Big-data Centric Technologies and Multi-hazard Modeling”. Southeast University, Nanjing, China.
- S19. Chen, Z. (2014). “Seminar: Disaster Resilience through Sensing, Modeling, and Computing at a Geospatial Scale”, New Jersey Institute of Technology.
- S18. Chen, Z. (2014). “Invited talk: Disaster Resilience through Collaborative Remote Sensing and Crowdsourcing”, The Western Chapter Missouri Society of Professional Engineers (MSPE) meeting, Kansas City, MO.
- S17. Chen, Z. and Zheng, W. (2014). “Introduction of UMKC Soil-Structure Interaction (SSI) Class”, Kansas City ASCE Geotechnical Seminar, Kansas City, MO.
- S16. Chen, Z. (2013). “Emerging Imaging and Information Technologies for Natural Disaster Response”. Invited presentation at University of Oklahoma, Norman.
- S15. Chen, Z. (2013). “Novel Remote Sensing and Computing Technologies for Disaster Damage Assessment”. Invited visit at NASA/JPL lab.
- S12. Chen, Z. (2012). “Wind Energy Basics”. Invited lecture speaker to ME111, UMKC’s Gen-Ed class ‘Environmental Sustainability’.
- S10. Chen, Z. (2011,2012). “Structural Performance Evaluation for Civil Structures - A Systems and Multi-disciplinary Approach”. Invited lecture speaker to ME111, UMKC
- S9. Chen, Z. (2010). “Novel Remote Sensing and Computing Technologies for Disaster Damage Assessment”; ImageCat, Inc., Long Beach.

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S6. Chen, Z. (2009). Probabilistic Classification and Uncertain Quantification in Image-based Urban Damage Assessment, 7th International Workshop on Remote Sensing and Disaster Response, Austin, TX (invited presentation).

### **PATENT AND TECHNOLOGY DISCLOSURE**

#### ➤ **Provisional Patents**

- Chen, ZhiQiang and Patrick J. Piper. “Autonomous Vehicles System.” Filed on 07/07/2017; United States Provisional Number 62/530,068.

#### ➤ **UMKC Technology Disclosure**

- Chen, ZhiQiang, Chen, Jianfei. “Energy-Efficient Aerial and Ground Sensing.” UMKC Technology Disclosure 16UMK017.

### **SOFTWARE, CODES AND APPS DEVELOPMENT**

#### ➤ **OpenSees-based Development**

- 1) **ProMH-S<sup>3</sup>**: **Probabilistic Multi-Hazard Seismic and Scour Simulation for Bridge Structures** (<http://info.umkc.edu/digitlab/ProMH-S3>: currently under construction and planned to be released December 2019)
- 2) Nonlinear single and coupled multiple soil-structure oscillators simulation codes
- 3) Soil-box and foundation-structure simulation codes for centrifuge-based physical modeling

#### ➤ **Developed Matlab (C++ if noted) Toolboxes**

- 4) Soil-structure system identification toolbox
- 5) Probabilistic relevance-vector machine-based multi-class classification toolbox
- 6) Conventional and Kernel-based non-parametric fragility modeling toolbox
- 7) Level-set image segmentation toolbox
- 8) FreeFEM++ based finite element-based level set methods (C++)
- 9) Linear and nonlinear dimensionality reduction toolbox
- 10) Nonlinear manifold learning toolbox
- 11) Digital change detection toolbox for optical images
- 12) Digital change detection toolbox for inSAR images
- 13) Disaster ObjectBank – an object-bank approach to disaster scene recognition and classification
- 14) Evidence-theoretic (Dempster-Shafer theory-based) data fusion toolbox for crowdsourced disaster-damage inference
- 15) Mobile-cloud Smart Apps and GeoViewer Analytics
  - DS-Crowd: Disaster Scene Crowdsourcing for Disaster-induced Damage Assessment (<http://info.umkc.edu/digitlab/smart-app-disaster-scene-crowdsourcing>; an improved version will be released in May 2015 – currently archived at <https://github.com/bgz82/DSCROWD>)
  - RT-DSA GeoViewer: Real-Time Disaster Scene Analytics GeoViewer, (<http://lasir.umkc.edu:8080/RT-DSA-GeoViewer/>)

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- GreenGarden: Green Infrastructure Performance Assessment through Smart Technology (<https://github.com/bgz82/GreenGarden>)
- 16) Research Databases
- StrSurf-Data: a pixel-level labeled imagery database including structural surfaces from concrete structures and asphalt pavement, which support the development of regular machine-vision or advanced deep learning based damage detection methods.
  - GDS-Data: Global Disaster Scene Database (a global disaster imagery database, which currently includes ground-level disaster imagery from several recent disaster events, including the 2011 Japan Earthquake, the 2013 Moore Tornado, and the 2014 South Napa Earthquake). Web address: (A new web interface for this database is being established, which supports disaster-scene understanding including disaster and damage classification, granular classification, semantic segmentation, etc.).
  - HyperSurf-Data: a hyperspectral imaging database that captures various civil infrastructure surface scenes and supports structural damage detection, semantic segmentation, and quantification.

## **THESIS AND RESEARCH SUPERVISION**

### ➤ **Postdoctoral researcher**

- 1) Dr. Hao Chen, 02/2016 - 02/2017.
  - Research topic: multi-scale porous media modeling using a hybrid LBM-FEM framework; application research in geo-hydronechanics and biomechanics; now assistant professor at Southwest Jiaotong University, China

### ➤ **Visiting Scholars**

- 1) Dr. Xinye Wu: Xiamen University, China; 08/2014 - 09/2015; research topic: vehicle stability and transportation infrastructure monitoring.
- 2) Dr. Wei Zhan: Yangze University, China; 01/2015 - 07/2015; research topic: nonlinear manifold learning and optimization
- 3) Dr. Zhaohua Dai: Nanjing Forestry University; 09/2015 - 03/2016; research topic: construction automation technologies.
- 4) Dr. Xiaotong Peng: Jinan University; 10/2015 - 10/2016; research topic: innovative resilient steel structures to multiple hazards.
- 5) Mr. Florian Klose: Technische Hochschule Nürnberg Georg Simon Ohm, B.S. in Electrical Engineering, 2017 (DAAD supported visiting student through DAAD's RISE Worldwide program; now at ).
  - Research topic: stereo imaging and implementation of FPGA-based embedded machine vision.
- 6) Mr. Benoît de Patoul: ECAM Brussels Engineering School, B.S. in Electrical Engineering, 2017 (now University College London; and now at Amazon, London).
  - Research topic: InSAR Image Processing and Damage Detection for Wildfire Events.

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- 7) Ms. Alina Klering: Heidelberg - Universität Heidelberg, B.S. in Electrical Engineering; 05/01/2019 – 09/30/2019 (DAAD supported visiting student through DAAD's RISE Worldwide program).
  - Research topic: deep learning and autonomous captioning for disaster scene understanding.
- 8) Dr. Lirong Li: Hubei University of Technology; 06/2018 – 06/2019; research topic: machine vision and deep learning for automated industrial inspection.
- 9) Dr. Hong Li; Hubei University of Technology; 02/2019– 01/2020; research topic: machine vision and deep learning for automated industrial inspection.
- 10) Dr. Gaihua Wang; Hubei University of Technology; 09/2019– 08/2020; research topic: deep learning methods, remote sensing, and applications.

### ➤ **Ph.D. Students**

- 1) Xuan Guo, Civil Engineering, Fall 2011 - Nov 2014.
  - Dissertation: Seismic Vulnerability Analysis of Scoured Bridge Systems (<http://search.proquest.com.proxy.library.umkc.edu/docview/1654779015>)
  - Awarded “Outstanding PhD Student in Engineering” by the School of Computing and Engineering, University of Missouri-Kansas City, Dec 2014. Now Assistant Professor at Yangzhou University, China.
- 2) Jianfei Chen, Computer Engineering, Fall 2013 - May 2019
  - Dissertation: Aerial-ground sensing networks: architecture, sensor activation, interference, and spatial energy optimization.
  - Awarded UMKC's School of Graduate Studies; Research Grant (\$6,500) for dissertation research on February 2015. Now senior machine-vision engineer at Sonic Research, San Diego, CA, USA.
- 3) Shimin Tang, Electrical and Computer Engineering, Spring 2016 – present (expected graduation, Dec. 2019).
  - Dissertation topic: Deep learning of anomaly from hyperspectral imagery data; awarded UMKC's School of Graduate Studies Research Grant (\$6,500) for dissertation research on February 2016.
- 4) Prativa Sharma, Civil Engineering, Jan. 2017 – present (expected graduation, May 2020).
  - Dissertation topic: probabilistic community and infrastructure resilience measurement.
- 5) Mostafa Badroddin, Civil Engineering, Jan. 2017 – present (expected graduation, Dec. 2019).
  - Dissertation topic: probabilistic multi-hazard and multi-physics assessment of bridge and other soil-foundation-structure systems.

### ➤ **M.S. Students with Thesis**

- 1) Molan Zhang, Computer Science, September 2019 ~ present
  - Thesis: Weakly supervised deep learning for disaster-scene understanding in remote sensing images.
- 2) Sameer Aryal, Civil Engineering, Jan. 2018 – present (expected graduation, Dec. 2019).
  - Thesis: Snap-shot Hyperspectral Imaging for Civil Infrastructure Damage Detection

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- 3) Varun Chavakula, MS in Computer Science, Fall 2016 - Fall 2017.
    - Thesis: NCC-EM: A Hybrid Framework for Decision Making with Missing Information
  - 4) Rahul Tripathi, Civil Engineering, Fall 2012 - Spring 2014
    - Thesis: Parametric Soil-Structure Modeling for Rapid Climatic Disaster Response
  - 5) Jianfei Chen, Computer Engineering, Fall 2011 - Sep. 2013
    - Thesis: A Study of Smart Device-based Mobile Imaging and Implementation for Engineering Applications
  - 6) Eric Swanson, Civil Engineering, Fall 2011 - Spring 2015
    - Thesis: Seismic response characterization for raised access floor and equipment system considering horizontal and vertical ground motion
  - 7) Syed Hussain, Civil Engineering, Summer 2015 - Fall 2016
    - Thesis: Probabilistic Characterization of Pile Group Capacities Considering Flood-Induced Scour
- **UMKC Graduate and Undergraduate Problem/Independent Study Research Advisor (without thesis)**
- 1) Chao Liang, B.S. in Mechanical Engineering, 2018.
    - Research topic: Development of GUI Interface for Python-based Lattice Boltzmann Modeling for Soil with Variable Hydrophobicity.
  - 2) Hana Bushehr, B.S. in Civil Engineering, 2018.
    - Research topic: seismic design of precast wall / slabs in Earth covered Magazine Structures considering vertical/horizontal loads.
  - 3) Santoshi Nerella, MS in Computer Science, 2017.
    - Research topic: Mobile-Cloud Smart App for Green Garden Assessment and Server Design and Implementation with Microsoft Azure.
  - 4) Uday Ballingu, MS in Mechanical Engineering, 2015 Spring - present.
    - Research topic: Soil-Structure System Field Testing and Identification (in progress)
  - 5) Rishabh Bhojak, MS, Computer Science, 2015.
    - Research topic: Mobile-Cloud Smart App for Green Garden Assessment and Server Design.
  - 6) Bhargava Gellaboina, MS in Computer Science, 2015.
    - Research topic: Mobile-Cloud Smart App Development, GIS Web Portal, Server Implementation, and Testing.
  - 7) Avinash Desireddy, MS in Computer Science, 2014.
    - Research topic: Mobile-Cloud Smart App for Disaster Scenes Analytics.
  - 8) Chase Caleb, B.S. in Computer Science, in progress; Research Assistant (January 2015 - December 2015).
    - Research Topic: Robotic Arm Design and 3D Printing for Small UAS System.
  - 9) Mallory Tackett, B.S. in Physics, 2015

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- Research Topic: Disaster Scenes Database and Training Data Construction from the Moore Tornado and the South Napa Earthquake; hyperspectral imaging analysis for dentistry applications (UMKC Honors Scholar Program).
  - 10) Leonardo Bueno, B.S. in Civil Engineering (visiting student from Brazil), in progress; Independent Study (August 2014 - December 2014).
    - Research Topic: Building-integrated Photovoltaics (BIPV) Aided by Multi-view Drone Imaging and 3D Scene Reconstruction.
  - 11) Teddy Haile-Mariam, Civil Engineering, 2012 Spring - Fall 2012.
    - Research Topic: seismic mainshock-aftershock databases and analysis.
  - 12) Isaac Somogie, B.S. in Civil Engineering, December 2012, now Master's Student at University of Kansas; Independent Study (August 2012 - December 2012).
    - Research Topic: 3D Bathymetric Point Cloud Processing for Scoured Bridge Foundation
  - 13) Kingsley Kantanka, B.S. in Civil Engineering, May 2013 (now Structural Engineers at KCPL); Teaching Assistant (August 2011 - December 2011).
    - Research Topic: Transmission Line Loading and Evaluation.
  - 14) Ryan Holmes, B.S. Civil Engineering, May 2014 (now Master Student at UMKC); Research Assistant
    - Research Topic: Hydraulic Flume Testing of Scoured Fluid-Soil-Structure Models.
    - Awarded the UMKC Undergraduate Research Grant (SEARCH).
  - 15) Ashlee Warnke, B.S. Civil Engineering, May 2015; Research Assistant (May 2013 - December 2013).
    - Research Topic: Global Disaster Scene Database Construction.
- **Ph.D. Dissertation and M.S. Thesis Committee Member**
- 1) Siamak Riyazi, Ph.D., Civil Engineering; in progress.
  - 2) Ali Koleiny, Ph.D., Geosciences, in progress.
  - 3) Claire Nowasell, Ph.D., Civil Engineering; defended August 2016.
  - 4) Feichen Shen, Ph.D., Computer Science; defended May 2016.
  - 5) Directed Reading: disaster scene big data and computing, Summer, 2014.
  - 6) Sashi Saripalle, Ph.D., Computer Engineering; defended August 2015.
    - Dissertation: A Multimodal Biometric Authentication for Smartphones.
  - 7) Vikas Gottemukkula, Ph.D., Computer Engineering, August, 2014.
    - Dissertation: Biometrics for smartphones using eye prints.
  - 8) Abdel-Rahman Abueladas, Ph.D., Geosciences, June 2014.
    - Dissertation: Assessment of Seismic Hazards along the Northern Gulf of Aqaba.
  - 9) Cervente Sudduth, Ph.D., Civil Engineering, in progress
  - 10) Siamak Riyazi, Ph.D., Engineering, in progress.
  - 11) Mayuri Patil, M.S., Civil Engineering, 2014.



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- 12) Rasekh Zadeh, M.S., Civil Engineering, 2011.
- 13) Anirudha Kadambi, M.S., Civil Engineering, 2012.
- 14) Bradley Gardner, M.S., Civil Engineering, 2012.
- 15) Mohammad Bayazid, M.S., Hydraulic Engineering, 2012.
- 16) Jacob Morgan, M.S., Hydraulic Engineering, 2013.
- 17) Jacob Ambrose, M.S., Hydraulic Engineering, 2013.
- 18) Shetye, Gunjan, M.S., Civil Engineering, 2013.
- 19) Nalagotla, Jitesh Kumar Reddy, M.S., Civil Engineering, 2013.

## **UNDERGRADUATE AND GRADUATE TEACHING**

### ➤ **Undergraduate**

- 1) CE 321 - Structural Analysis
- 2) CE 421 - Matrix Methods
- 3) CE 401 - Advanced Structural Analysis

### ➤ **Graduate**

- 4) CE 5679 - Dynamics of Structures
- 5) CE 5501AE - Advanced Engineering Mathematics
- 6) CE 5501AS - Applied Soil-Structure Interaction Analysis and Design
- 7) CE 5501MM - Introduction to Finite Element Methods
- 8) CE 5501MF - Mathematical Foundation of Finite Element Methods (UM Course Sharing Award; co-instructor at UMKC)

## **RESEARCH COLLABORATORS**

*The following collaborators have worked with Dr. ZhiQiang Chen in research proposals or key publication work.*

### ➤ **Industries and National Labs**

- Ms. Margaret Glasscoe at the Solid Earth Group, Jet Propulsion Lab, NASA; Ms. Bandana Kar, Oak Ridge National Lab; Mr. Ron Eguchi, President at ImageCat, Inc.; Mr. Zongbo Wang, Ainstein, Inc.; Mr. Andrew Bodkin, Bodkin Design & Engineering, LLC.; Mr. Harold Sprague, Principal Technical Consultant, Parsons Corporation; Mr. Daug Bausch, Niyam IT; Dr. Kent Yu, SEFT Consulting Group; Mr. Jerome Bouvard, Parrot.

### ➤ **Academic**

- UMKC: Dr. Xiaobo Chen (nanomaterials synthesis, characterization, and modifications); Dr. Yugi Lee (mobile-cloud computing); Dr. Rao Praveen (big data and databases); Dr. Corry Beard (Networking); Dr. Jejung Lee (geosciences); Dr. Zhu Li (machine vision); Dr. Debeora O'bannon (green infrastructure); Dr. Jerry Richardson (bridge scour; river engineering).
- Other Universities: Dr. Xiaoming He (Applied mathematics), University of Missouri Science and

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Technology; Dr. WeiChiang Pang (Hurricane modeling and risk analysis), Clemson University; Dr. Hussam Mahmoud (Hybrid simulation), Colorado State University; Dr. Brian Phillips (Hybrid simulation), University of Maryland; Drs. Mike Olsen, Andrea Barbosa, Ben Mason at Oregon State University; Dr. Edwin Chow, Texas State University; Dr. Yang (Cindy) Yi (Wireless power delivery/real-time embedded computing), University of Kansas; Dr. Marlon Pierce (cloud computing infrastructure), Indiana University; Dr. Raja Sengupta (UAV, SLAM), Dr. Kenichi Soga (Wireless network sensing; geosystems and infrastructure monitoring), University of California, Berkeley.

### ➤ **International Collaborators**

- Israel: Prof. Eyal Ben-Dor, Chair, Professor at the Department of Geography, Tel-Aviv University Prof. Rony Wallach, Faculty of Agriculture, Food and Environment, the Department of Soil and Water Sciences, The Hebrew University of Jerusalem.
- Germany: Dr. Thomas Esch, German Aerospace Center (DLR) (inSAR imaging and disaster response).
- Japan: Dr. Ji Dang, Saitama University (image-based structural health monitoring)
- China: Drs. Jian Zhang and Dr. Gang Wu, Southeast University, (Smart City and Mega-structure monitoring); Drs. Quan Gu (soil-structure interaction), Ying Lei (structural health monitoring), Xiamen University; Dr. Changhai Zhai (Earthquake Engineering), Harbin Institute of Technology.

## **PROFESSIONAL ACTIVITIES**

### ➤ **Reviewer for Funding Agencies**

- The Icelandic National Research Fund (2010, 2011, 2013); NASA (2015); National Science Foundation (2017, 2018, 2019); United States Department of Agriculture (2016); Department of Homeland Security (2017); University of Missouri System Research Board Fund (2011, 2012, 2013, 2014).

### ➤ **Frequent Reviewer for Journals**

- IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing; IEEE Transaction on Geosciences and Remote Sensing Letter; IEEE Transaction of Geoscience and Remote Sensing; IEEE Transaction on Mechatronics; IEEE Sensors.
- EERI Earthquake Spectra.
- ASCE Journal of Computing in Civil Engineering; ASCE Journal of Bridge Engineering; ASCE Natural Hazards Review; ASCE Journal of Structural Engineering; ASCE-ASME Journal of Risk and Uncertainty in Engineering.
- International journals: Advances in Civil Engineering; Agricultural Water Management; Automation in Construction; Computer Aided Civil and Infrastructure Engineering; Computer Modeling in Engineering & Sciences; Computers in Industry; Entropy; Earthquake Engineering and Engineering Vibration; Frontiers in Environmental Science; International Journal of Computers and Concrete; Journal of Earthquake Engineering; Journal of Flood Risk Management; Journal of Civil Structural

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Health Monitoring; Journal of Structural Integrity and Maintenance; Journal of Harbin Institute of Technology; Journal of Asian Architecture and Building Engineering; Mathematical Problems in Engineering; Measurement; Sensors; Remote Sensing; Shock and Vibration; Soil Dynamics and Earthquake Engineering; Structural Engineering and Mechanics; Structure and Infrastructure Engineering; Structural Engineering International; Water Science and Engineering.

### ➤ **Editorial and Academic Services**

- Guest Editor of ASCE Natural Hazards Review, 2017 - present.
- Guest Lead Editor of International Journal of Geophysics, 2018 - present.
- Short-course organizer and Chair, 2019 EVACES, Nanjing, China
- Session Organizer and co-Chair, 2018 ASCE EMI Conference, Boston, MI.
- Session Organizer and Chair, 2014 US National Conference on Earthquake Engineering, Anchorage, Alaska.
- Session Organizer and Chair in 2012 Structures Congress, Chicago, IL.
- Session Chair in IEEE International Geoscience & Remote Sensing Symposium, July 6-11, 2008, Boston, MA

### ➤ **Book Review**

- CRC: Integrating Scale in Remote Sensing and GIS, CRC Press. 2015; CRC: Remote Sensing Cloud Computing, 2018

### ➤ **Professional Society**

- American Society of Civil Engineers (ASCE), 2004 – present
  - ASCE Structural Engineering Institute
  - Member of ASCE Performance-Based Design of Structures Committee
  - Member of ASCE Multiple Hazard Mitigation Subcommittee
  - ASCE Infrastructure Resilience Division (IRD): Member of Disaster Response and Recovery Committee; Member of Emerging Technologies Committee
- Institute of Electrical and Electronics Engineers (IEEE), 2006 - present
- Earthquake Engineering Research Institute (EERI), 2007 – present
- Chi Epsilon, 2010 – present

### ➤ **UMKC Community Services**

- Dr. Chen hosted the popsicle bridge session for the annual Kansas City Summer Transportation Institute, Jun, 2016; Dr. Chen presented to Kansas City Summer Transportation Institute on Jun 24, 2015 on small/micro UAV or drone technologies and policy implications; Judge for the PLTW-Kansas City Engineering Design Competition or the Biomedical Research & Design Competition, Apr. 2016; KC STEM Competition Judge, 2016; UMKC SEARCH Symposium Judge, 2014; Black and Veatch Scholars, Small-scale soil-structure shaking and real-time mobile imaging and computing for Prep-KC students, Dec. 2012; Interactive dynamic demonstration of liquefaction,

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outreach for Women in Engineering and Technology Program, May 2011; Environmental Studies Affiliated Faculty member, 2012-present; UMKC SEARCH grants reviewer, 2013; Judge for UMKC Community of Scholar, 2012, 2014; participated in numerous SCE organized students and K-12 outreach, 2010-2018.

### ➤ **Local and National Community Services**

- RideKC Committee of KCTA, 2018; Global Earthquake Disasters, Damage Mapping and Crowdsourcing, Middle School Week, Apr. 2013; ‘Champion’ for reporting regional civil infrastructure report card in Kansas City area: Energy Infrastructure, Dec. 2012; Volunteer for EERI’s GEO-CAN Community: Haiti earthquake damage assessment from aerial imagery, Feb. 2010; Volunteer for USUCGER: Liquefaction effects in Haiti identified from aerial imagery, Mar. 2010

## **HONORS AND OTHER AWARDS**

- University of Missouri Faculty Scholar, 2013.
- IBM Smarter Planet Faculty Innovation Award, “*Smart Sensing and Computing for Smarter Energy*”; 12/2011-12/2012.
- NSF USUCGER’s Early Career Travel Award, 2012; NSF Travel Award from NSF for Real-Time Hybrid Simulation Workshop, 2011; NSF Travel Award for NSF CMMI Proposal Workshop, Lincoln NE, 2010; NSF Travel Award for NSF-NEES Geotechnical Workshop, 2009.
- Fellowship from Chancellor’s Interdisciplinary Collaboratories Program, University of California, San Diego, 2008.
- Calit2 Graduate Fellow and The Holmes Foundation Fellowship, University of California, Irvine, 2004 & 2005.
- University Graduate Fellowship, Michigan Technological University, 2001.

## **MEDIA COVERAGE**

### ➤ **Local and National News**

- “Group from UMKC studying tornado damage in Jefferson City”, KCTV, [https://www.kctv5.com/weather/group-from-umkc-studying-tornado-damage-in-jefferson-city/article\\_8d831462-7e6e-11e9-a5fd-bb2956f33168.html](https://www.kctv5.com/weather/group-from-umkc-studying-tornado-damage-in-jefferson-city/article_8d831462-7e6e-11e9-a5fd-bb2956f33168.html), May 24, 2019.
- “KC researcher’s idea to aid tornado rescue could soon be reality”, KSHB 41 TV News -- [http://www.kshb.com/dpp/news/local\\_news/kc-researchers-idea-to-aid-tornado-rescue-could-be-reality-soon](http://www.kshb.com/dpp/news/local_news/kc-researchers-idea-to-aid-tornado-rescue-could-be-reality-soon), May 22, 2013.
- Live interview at the KCTV5’s Morning Show and discussion of remote sensing research for real-time rescue and recovery (interviewed by Dave Hall, david.hall@kctv5.com), May 22, 2013, <http://www.kctv5.com/>.
- “Eclipse watch: Drones to help UMKC-led researchers analyze gridlock” <http://www.startlandnews.com/2017/08/eclipse-drones-umkc-gridlock/>.

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- “Group develops drone emergency response protocol”  
[http://www.newspressnow.com/news/local\\_news/group-develops-drone-emergency-response-protocol/article\\_e7ff400b-8763-5971-a629-550793d97784.html](http://www.newspressnow.com/news/local_news/group-develops-drone-emergency-response-protocol/article_e7ff400b-8763-5971-a629-550793d97784.html).
- “University of Missouri-Kansas City Pursues Hyperspectral Agriculture with Bodkin Design”,  
<http://www.prweb.com/releases/2017/03/prweb14190944.htm>.
- “NASA's E-DECIDER Rapid Disaster Decision Support Products”,  
<http://www.jpl.nasa.gov/spaceimages/details.php?id=PIA18797>.
- **UM System and UMKC**
  - “Experts available to the media for stories related to flooding in the Midwest”,  
[https://www.umsystem.edu/ums/news/news\\_releases/050219\\_news](https://www.umsystem.edu/ums/news/news_releases/050219_news)
  - “Aware Vehicles, UMKC partner to develop Unmanned Aerial Vehicle automation”,  
[https://info.umkc.edu/news/the-future-of-drone-technology/`](https://info.umkc.edu/news/the-future-of-drone-technology/)
  - “UMKC Center for Big Imaging and Smart City Technologies”,  
[https://info.umkc.edu/umatters/umkc-center-for-big-imaging-and-smart-city-technologies/.](https://info.umkc.edu/umatters/umkc-center-for-big-imaging-and-smart-city-technologies/)
  - “Drone Technology Proves Beneficial to Emergency Response”,  
<https://info.umkc.edu/umatters/drone-technology-proves-beneficial-to-emergency-response/>
  - “Professor Receives Seed Grant to Create Hydrophobicity Sensing Prototype”  
[http://info.umkc.edu/umatters/professor-receives-seed-grant-to-create-hydrophobicity-sensing-prototype/.](http://info.umkc.edu/umatters/professor-receives-seed-grant-to-create-hydrophobicity-sensing-prototype/)
  - “Advanced Drone and Mobile Technologies to Assist Emergency Managers”,  
[http://info.umkc.edu/news/advanced-drone-and-mobile-technologies-to-assist-emergency-managers/.](http://info.umkc.edu/news/advanced-drone-and-mobile-technologies-to-assist-emergency-managers/)
  - “Dr. ZhiQiang Chen works to prevent scour -- the number one cause of bridge collapse”,  
<http://www.umkc.edu/news/news-release.asp?id=1027>.
  - Dr. ZhiQiang Chen Researcher in National Earthquake Disaster Response Project.  
[http://sce.umkc.edu/2013/11/05/dr-zhiqiang-chen-researcher-in-national-earthquake-disaster-response-project/.](http://sce.umkc.edu/2013/11/05/dr-zhiqiang-chen-researcher-in-national-earthquake-disaster-response-project/)
  - “Damage Mapping on the Go”, [http://info.umkc.edu/scenews/2013/10/03/damage-mapping-on-the-go/.](http://info.umkc.edu/scenews/2013/10/03/damage-mapping-on-the-go/)
  - Invited speaker for the MSPE WC Meeting [http://info.umkc.edu/scenews/2014/04/08/professors-chen-and-kevern-speak-at-mspe-wc-meeting/.](http://info.umkc.edu/scenews/2014/04/08/professors-chen-and-kevern-speak-at-mspe-wc-meeting/)
  - ZhiQiang Chen’s Remote Sensing Research Will Help First Responders.  
[http://info.umkc.edu/scenews/2013/05/22/zhiqiang-chens-remote-sensing-research-will-help-first-responders/.](http://info.umkc.edu/scenews/2013/05/22/zhiqiang-chens-remote-sensing-research-will-help-first-responders/)