

CHUL MIN YEUM

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CONTACT INFORMATION

Assistant Professor

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RESEARCH INTERESTS

Smart Structure; Computer Vision; Mixed (Augmented) Reality; Machine Learning; Big Data; Nondestructive Testing; Sensing Technologies; Composite Structures; Digital Signal Processing; FE Modeling & Analysis.

EDUCATION

- Ph.D., Civil Engineering, Purdue University, West Lafayette, IN, USA** 2012-2016
• Dissertation: *Computer Vision-Based Structural Assessment Exploiting Large Volumes of Images.*
- M.S., Civil Engineering, Korea Advanced Institute of Science & Technology (KAIST), South Korea** 2008-2010
• Thesis: *Lamb Wave Mode Decomposition using Concentric Ring and Circular PZT Transducers.*
- B.S., Civil Engineering, Korea Advanced Institute of Science & Technology (KAIST), South Korea** 2002-2008

EMPLOYMENT HISTORY

- Assistant Professor, Department of Civil & Environmental Engineering** 2018-Present
University of Waterloo, Waterloo, ON, Canada
- Postdoctoral Researcher, Lyles School of Civil Engineering** 2016-2018
Purdue University, West Lafayette, IN, USA
- Research Assistant, Lyles School of Civil Engineering** 2012-2016
Purdue University, West Lafayette, IN, USA
- Researcher, Department of Civil & Environmental Engineering** 2010-2012
Korea Advanced Institute of Science & Technology (KAIST), South Korea
- Research Assistant, Department of Civil & Environmental Engineering** 2008-2010
Korea Advanced Institute of Science & Technology (KAIST), South Korea

RESEARCH EXPERIENCE

- KIMM-AKCE (PI)**, supported by KIMM. Award funding: \$20,000 (CAD) for 08/01/22-12/31/22 in the support of a research project entitled "Structure Inspection using Building Information Modeling and Augmented Reality" 2022
- HIIFP (PI)**, supported by MTO. Award funding: \$52,875 (CAD) for 04/01/22-03/31/2023 in 2022- Present

the support of a research project entitled “Development of an Image-based Surface Roughness Measurement System”

3. **Mitacs Accelerate (PI)**, supported by Mitacs (industry partner: JACOB). Award funding: 2022-Present \$30,000 (CAD) for 04/01/22-03/30/23 in the support of a research project entitled “Compatible Sewer Pipe Defect Detection and Estimation of its Key Characteristic with Two Different Imaging System”
4. **Mitacs Accelerate (PI)**, supported by Mitacs (industry partner: MDA). Award funding: 2022-Present \$45,000 (CAD) for 01/01/22-06/30/23 in the support of a research project entitled “Nuclear Decommissioning Management using Building Information Modeling and Augmented Reality”
5. **Seed Grant Program (Co-PI)**, supported by the Water Institute. Award funding: \$20,000 2021-2022 (CAD) for 04/01/2021– 03/31/2022 in the support of a research project entitled “Data fusion and analysis to predict overland flow flood risk: establishing a proof of concept”.
6. **SOSCIP GPU-Accelerated platform (PI)**, supported by SOSCIP consortium. Access 4 GPU 2021-2022 years and 100 TB storage to support research partnership with Rogers. Subscription period: 06/01/2021-12/31/2022
7. **Funding for research infrastructure (CFI-JELF)**, supported by John R. Evans Leaders Fund. 2021-2024 Award funding: \$277,830 (CAD) for 05/01/21-04/30/26 in the support of a research project entitled “Infrastructure for Advancing Vision-based Structural Assessment Technologies”.
8. **Consulting service (PI)**, funded by MacDonald, Detwiller, and Associates, Inc. (MDA) in the 2021 support of a research project entitled “Study on Decommissioning Robotics“. Award funding: \$5,000 (CAD) for 03/01/2021– 03/31/2021.
9. **Voucher for Innovation and Productivity (VIP) program (Co-PI)**, supported by Ontario 2021-2022 Centers of Excellence (OCE). Award funding: \$150,000 (CAD) for 09/01/2020 – 08/31/2022, leveraged from Roger’s grant for “Research partnership: 5G-Enabled Smart Infrastructure Applications”.
10. **Research partnership: 5G-Enabled Smart Infrastructure Applications (Co-PI)**, supported by 2020-2022 Rogers. Award funding from Rogers: \$135,000 (CAD) for 09/01/2020 – 08/31/2022. Use 5G to create geo-spatial maps in real-time using ground-based robots and design mobile edge computers for on-device analysis of the data using AI algorithms.
11. **Mitacs Globalink Research Internship (Principal Investigator)**, supported by Mitacs. Three 2021 international undergraduate students will come and do an internship in my lab during Summer 2021.
12. **Discovery Launch Supplement (Principal Investigator)**, supported by NSERC, Award 2020-2026 funding: \$12,500 (CAD) for 04/01/2020 – 03/31/2026: This award provides timely resources to support Early Career Researchers as they establish a Discovery Grant-funded research program (award of \$12,500 (CAD)).

- 13. Discovery Grant: Enhancing Infrastructure Resiliency Through Visual Data Analytics** *2020-2026*
(Principal Investigator), supported by NSERC under Grant No. RGPIN-1509, Award funding: \$130,000 (CAD) for 04/01/2020 – 03/31/2026: Deliver the computational algorithm to accelerate the development of safer, more resilient infrastructure by collecting and analyzing visual data.
- 14. Collaborative research with Aerialtronics (Principal Investigator)**, creating the data-sharing agreement with Aerialtronics: Develop vision-based visual inspection using an autonomous drone equipped with a new dual spectrum sensor, PENSAR (developed by Aerialtronics). *2018-2019*
- 15. CDS&E: Enabling time-critical decision-support for disaster response and structural engineering through automated visual data analytics (Postdoctoral Researcher, Purdue University)**, supported by NSF under Grant No. NSF-1608762 (07/17/16 – 07/15/19): Develop a deep learning algorithm to automatically classify images collected from post-event reconnaissance missions to enable scientific research and code development. *2017-2018*
- 16. EAGER: Active citizen engagement to enable lifecycle management of infrastructure systems, (Postdoctoral Researcher, Purdue University)**, supported by NSF under Grant No. NSF-1645047 (07/28/16 – 08/31/18): Develop a lifecycle structural management system using crowdsourcing images. *2017-2018*
- 17. Automated (Image-Based) collection and measurements for construction pay items, (Research Assistant, Purdue University)**, supported by Indiana Dept. of Trans. under JTRP Project SPR-4006 (08/01/15 – 08/01/17): Develop software for orthophoto generation and graphical measurement to improve efficiency and safety in measuring the pay items placed at a construction site. *2015-2017*
- 18. Ultra-low-power wireless sensors for advanced, in situ structural health monitoring, (Research Assistant, Purdue University)**, Supported by Small Business Innovative Research (SBIR) Program under Contract No. W9132T-12-C-0020 (08/01/12 – 08/01/15): Develop a self-contained, low-power distributed wireless sensor network to monitor usage patterns of a rapidly emplaced military bridge. *2012-2015*
- 19. Development of on-board SHM technologies for composite air vehicles, (Research Assistant, KAIST)**, supported by The Boeing Company (08/01/08 – 07/31/11): Develop an online structural health monitoring system that allows detection and localization of delamination in composite aircraft without relying on past reference data. *2008-2011*

TEACHING EXPERIENCES

- CIVE497-CIVE700: Smart Structure Technology** at University of Waterloo *W2022, W2021*
- This course offers an introduction to the emerging smart structure technologies in civil *W2020, W2019* engineering. Among several topics in smart structure, this course focuses on structural assessment using optical sensor data by implementing state-of-art image processing and computer vision techniques.
 - Course website: <https://github.com/chulminy/CIVE497-CIVE700>

AE/ENVE/GEOE 121: Computational Method at University of Waterloo

S2022

- This course offers a practical introduction to computer programming for engineering students using MATLAB. MATLAB is an easy and readable programming language and is an excellent choice for those learning programming for the first time. This course will cover various topics including programming fundamentals, matrix operations, file I/O, numerical methods, and data visualization. S2021, W2022 S2020, S2019
- Course website: [https://github.com/chulminy/AE ENVE GEOE 121](https://github.com/chulminy/AE_ENVE_GEOE_121)

EDUCATIONAL EXPERIENCES**Invited Guest Lecturer**

May 2022

- Building Instrumentation in AE 405 at Waterloo

Invited Guest Lecturer

July 2016

- Image-based Sensing in CE 597 at Purdue University.

Invited Guest Lecturer

June 2010

- International Research Experience for Undergraduates Program in Smart Structures, KAIST.

STUDENT ADVISING**Supervisor, Ph.D. Student, University of Waterloo**

2020-present

- **Rishabh Bajaj** (Started in F2020, co-supervised by Sriram Narasimhan): Adaptive image collection system for visual inspection
- **Zaid Abbas Al-Sabbag** (Started in F2020 as a master and will transfer to a PhD in F2021, co-supervised by Sriram Narasimhan): Application of mixed reality in civil engineering
- **Max Midwinter** (Started in S2020 as a master and will transfer to a PhD in F2021): Deep learning application for visual assessment.

Supervisor, Master Student, University of Waterloo

2019-present

- **Juan Park** (W2019 – W2021): Visual analytics for visual assessment.

Dissertation Committee, Ph.D. Student, University of Waterloo

2018-present

- **Daniel Lopez Morales** (started in F2020): Finding Exact Industrial Objects in Point Clouds using Machine Learning and Procedural Scene Generation
- **Kareem Mostafa** (Started in F2018): Image-based Learning for Smart City Rehabilitation
- **Stephen Phillips** (Started in F2017): Asset Information Modelling with Mobile Robotics

Thesis Committee, Master Student, University of Waterloo

2020-present

- **Tarek Ghareeb Mohamed** (2022): Early Flame Detection system Using Real-time Machine-Vision and Image Analysis
- **Ben O'Callaghan** (2021): Effects of GFRP Reinforcement on the Compressive Behaviour of Square SPF Timber Columns
- **Nik Knezic** (2021): Coagulant addition for managing sediment-associated phosphorus

bioavailability to prevent cyanobacterial blooms in drinking water reservoirs

- **Devin Feng** (2021): A Rules-based Mode Choice Model using CHAID Decision Trees and Dynamic Transit
- **Alan Xaykonga** (2021): AADT Estimation Models and Analytical Comparison of Pedestrian Safety Risk Evaluation Methods for Signalized Intersections
- **Matthew Iannetta** (2020): Design of a Remote, Integrated, Automatic and Continuous Bedload Sediment Transport Monitoring Station and Application in a Rural Stream in Southern Ontario
- **Evan Marco McLaughlin** (2020): A deep learning approach for automating concrete bridge defect assessment using computer vision

Supervisor, Undergraduate Research Internship (Co-op), *University of Waterloo*

2019-present

- **Noreen Gao** (F2021, S2022): Structure assessment using augmented reality
- **Alice Liang** (S2021): Crack segmentation using deep learning
- **Jason Connelly** (F2020): Augmented reality smart glass application for visual assessment
- **Max Midwinter** (W2019): Development of the adaptive image collection system for visual inspection (co-supervisor for an NSERC undergraduate student research award)
- **Joyceline Nathaniel** (W2019): Development of an image-based recommendation system for home buyers

Supervisor, Undergraduate Research Assistantship, *University of Waterloo*

2018-present

- **Andy Zhao** (S2022): Build a mobile data collection system (hardware)
- **Andrei Muresanu** (F2021): Flood risk analysis using deep learning
- **Shuxian Nian** (W2020): Disaster recovery monitoring
- **Jason Connelly** (F2019, S2020): Unity 3D design for Hololens application
- **Juan Park** (F2018; W2019): Structural assessment using big visual data
- **Max Midwinter** (F2018; S2019): Vision-based structural inspection
- **Shuai Yuan** (W2018): Smart assistance platform for pipe inspection
- **Tianyi Yu** (W2018): Smart assistance platform for pipe inspection
- **Wendy Chikowero** (W2018): Machine learning approach for finite element methods
- **Zaid Abbas Al-Sabbag** (W2018): Mobile digital image correlation solution
- **Marilyn Wang** (W2018): Detection of efflorescence stains using images
- **Tianpeng Hong** (W2018): Deployment of a PENSAR camera for visual inspection.

Supervisor, Globalink Research Internship, *Mitacs*

2021-present

- **Sameer Memon** (S2022): Robotics Based Infrastructure Inspection
- **Fedrick Hasan** (S2022): Augmented Reality Applications in Structure Assessment and Asset Management
- **Swasti Shreya Mishra** (F2021): Enabling resilient communities through Visual Data Analytics
- **Yao Lin** (S2021): Augmented reality applications in structure assessment and asset management

- **Bowei Song** (S2021): Augmented reality applications in structure assessment and asset management

Student Mentor, Master's Thesis, *Purdue University* 2013-2015

- **Ricardo E. Basora Rovira**: Vehicle classification method for use with rapidly emplaced mobile bridges: a sensitive study.

Student Mentor, Summer Undergraduate Research Fellowship (SURF), *Purdue University* Sum. 2013

- **Tong Li**: The development of a vision-based vibration measurement for civil structures.

Student Mentor, Undergraduate Research Program, *KAIST* 2008-2010

- **Min Sang Park and Byeong Mo Choi** (2010): Development of an automated real-time rail detecting system using non-contact sensing techniques.
- **Young Hwan Seo** (2009): Stress analysis of bolted joints.
- **Hyung Jin Lim** (2008): Theoretical modeling for A_0 Lamb wave reflection and transmission at a finite vertical discontinuity using Eigen-mode method.

HONORS & AWARDS

GRADflix from Waterloo AI Nov. 2021

- Zaid Al-Sabbag won first place in Waterloo.AI GRADflix Competition with his research on augmented reality and its uses in infrastructure maintenance (\$2,000 cash prize)
- Video: https://www.youtube.com/watch?v=9_qA6SwnLOU

MS Azure Credit from Microsoft Nov. 2019

- Microsoft awarded free Azure credits (\$20,000 in 2019, \$9,000 in 2020) to selected projects in AI for Waterloo.ai members. Dec. 2020

Editor's Choice from *Journal of Performance of Constructed Facilities* Feb. 2019

- The paper, "Post-Event Reconnaissance Image Documentation using Automated Classification" is selected as an Editor's Choice article.

NVIDIA GPU Grant from NVIDIA Dec. 2018

- This program seeds a gift of one GPU intended to enable researchers to get started using GPUs. One Titan V GPU is received for deep learning research.

Travel awards from *Natural Hazards Engineering Research Infrastructure (NHERI)* June 2018

- The awardee receives full travel support up to \$2,500 for the participation in NHERI-the Summer Institute at the University Texas at San Antonio

CE Outstanding Graduate Student from *Lyles School of Civil Engineering, Purdue University* May 2017

- This award recognizes excellence in both research and serve to the school, college and the university community (award of \$500).

Innovation in Computing Award from *Computer-Aided Civil and Infrastructure Engineering* July 2016

- The paper, "Vision-Based Automated Crack Detection for Bridge Inspection," is selected as 2015 Hojjat Adeli Award for innovation in computing (award of \$1,500).

Discovery, Engagement & Learning (DEAL) Grant from Purdue Graduate Student Government	2013-2014
<ul style="list-style-type: none"> This grant offers monetary assistance by helping multidisciplinary research of graduate students (award of \$2,500 for each project). 	
Research Assistantship from Purdue University	2012-2016
<ul style="list-style-type: none"> Graduate researcher assistantship in the Lyles School of Civil Engineering, Purdue University. 	
Top 25 Hottest Articles in <i>Wave Motion</i>	2011
<ul style="list-style-type: none"> The paper entitled “Lamb Wave Mode Decomposition using Concentric Ring and Circular PZT Transducers” is ranked as the 3rd hottest article (among 25) for 2011 full year through. 	
Research Assistantship from KAIST	2008-2010
<ul style="list-style-type: none"> Graduate researcher assistantship in the school of civil engineering, KAIST. 	
Undergraduate Research Program Award from KAIST	2008
<ul style="list-style-type: none"> Receive the 3rd prize for the winter/spring undergraduate research program at KAIST in 2008. 	
Scholarships for outstanding students from KAIST	2006-2008
<ul style="list-style-type: none"> This scholarship is awarded to three prominent students in the School of Civil Engineering, KAIST (award of \$2,000 per year for three years). 	

PRESENTATIONS & TALKS

Research Seminar,	Apr 2022
<ul style="list-style-type: none"> Organized by MARS-SHM (https://mars-shm.com/workshops/) 	
Research Seminar, Dankook University, Yongin, South Korea	Nov 2019
Research Seminar, Sejong University, Seoul, South Korea	Nov 2019
Research Seminar, Korea Advanced Institute of Science & Technology, Daejeon, South Korea	Oct 2019
Professional Presentation	Sep 2017
<ul style="list-style-type: none"> SHM-in-Action (invited) in the 11th Inter. Workshop on SHM (IWSHM), Stanford, CA, USA. 	
Professional Presentation	
<ul style="list-style-type: none"> 3rd Midwest Smart Structures Colloquium, Danville, IL. 	Oct 2017
<ul style="list-style-type: none"> 2nd Midwest Smart Structures Colloquium, West Lafayette, IN. 	Sep 2016
<ul style="list-style-type: none"> 1st Midwest Smart Structures Colloquium, Grafton, IL. 	Oct 2015

SYNERGISTIC LEADERSHIP POSITIONS

Committee Member, SEI Technical Activities Division Structural Control and Sensing Committee of the Technical Administrative Committee on Analysis and Computation.	Apr 2021-Sep 2027
Co-Organizer, 7 th World Conference on Structural Control and Monitoring (7WCSCM), Qingdao, China	June 2018

- Co-organized a special session on “*Innovations in Computer Vision for Structural Monitoring and Damage Detection.*”

Workshop Secretary, Global Policies for Infrastructure Monitoring & Management, Purdue University August 2012

PEER-REVIEWED JOURNAL PAPERS (24 published, 2 accepted, 1 submitted) *: direct- or co-supervision.

1. Zaid Abbas Al-Sabbag*, **Chul Min Yeum**, Sriram Narasimhan, “Enabling Human-Machine Collaboration in Infrastructure Inspections through Mixed Reality,” *accepted in Advanced Engineering Informatics*, (2022)
2. Ju An Park*, Xiaoyu Liu, **Chul Min Yeum**, Shirley J. Dyke, Max Midwinter*, Jongseong Choi, Zhiwei Chu, Thomas Hacker, Bedrich Benes, “Multi-output Image Classification to Support Post-Earthquake Reconnaissance,” *accepted in Journal of Performance of Constructed Facilities*, (2022).
3. Zaid Abbas Al-Sabbag*, **Chul Min Yeum**, Sriram Narasimhan, “Interactive Defect Quantification Through Extended Reality”, *Advanced Engineering Informatics*, 51, 101473, (2022)
4. Sangyoung Han, Taemin Heo, **Chul Min Yeum**, Kukjoo Kim, Jongkwon Choi, Mang Tia, “Machine learning approach to evaluate built-in curling of concrete pavement,” *preparing for resubmission*.
5. Jongseong Choi, Lazaros Toumanidis, Shirley J. Dyke, **Chul Min Yeum**, Patrikakis Charalampos, Ali Lenjani, Xiaoyu Liu, and Panagiotis Kasnesis, “Automated Graffiti Detection: A Novel Approach for Maintaining Historical Structures in Community,” *Applied Sciences*, 12(6), 2983, (2022).
6. Jongseong Choi, Ju An Park*, Shirley J. Dyke, **Chul Min Yeum**, Xiaoyu Liu, Iliia Billionis, and Ali Lenjani, “Similarity-based Building Search Capability for Post-event Image Data,” *Computer-Aided Civil and Infrastructure Engineering*, 37 (2), 261-275, (2022).
7. Ju An Park*, **Chul Min Yeum**, Trevor D. Hrynyk, “Learning-based Image Scale Estimation using Surface Textures for Quantitative Visual Inspection,” *Computer-Aided Civil and Infrastructure Engineering*, 36(2), 227-241, (2020).
8. Xiaoyu Liu, Shirley J. Dyke, **Chul Min Yeum**, Ilias Billionis, Ali Lenjani, and Jongseong Choi, “Automated Indoor Image Localization to Support a Post-Event Building Assessment,” *Sensors*, 20, no. 6 (2020).
9. Ali Lenjani, Ilias Billionis, Shirley Dyke, **Chul Min Yeum**, and Ricardo Monteiro, “A Resilience-based Method for Prioritizing Post-event Building Inspections,” *Natural Hazards*, 100, 877-896, (2020).
10. Ali Lenjani, Shirley Dyke, Ilias Billionis, **Chul Min Yeum**, Kenzo Kamiya, Jongseong Choi, Xiaoyu Liu, and Arindam Gan Chowdhury, “Towards fully automated post-event data collection and analysis: pre-event and post-event information fusion,” *Engineering Structures*, 208, no.1, (2020).
11. Bernard Engel, Won Seok Jan, and **Chul Min Yeum**, “Integrated environmental modeling for efficient aquifer vulnerability assessment using machine learning,” *Environmental Modelling and Software*, 124, (2020).
12. Ali Lenjani, **Chul Min Yeum**, Shirley J. Dyke, and Ilias Billionis, “Automated Building Image Extraction from 360-degree Panoramas for Post-Disaster Evaluation,” *Computer-Aided Civil and Infrastructure Engineering*, 35, no. 3, (2020).
13. **Chul Min Yeum**, Shirley J. Dyke, Bedrich Benes, Thomas Hacker, Julio A. Ramirez, Alana Lund, and Santiago Pujol, “Post-Event Reconnaissance Image Documentation using Automated Classification,” *Journal of Performance of Constructed Facilities*, 33(1), (2018). Editor’s Choice Selection (2019).
14. **Chul Min Yeum**, Jongseong Choi, and Shirley J. Dyke, “Automated Region-of-interest Localization and

Classification for Vision-based Visual Assessment of Civil Infrastructure,” *Structural Health Monitoring* 15, no. 3 (2019).

15. **Chul Min Yeum**, Alana Lund, Shirley J. Dyke, Julio A. Ramirez, “Automated Recovery of Documents from Earthquake Reconnaissance Images,” *Journal of Computing in Civil Engineering* 33, no. 1 (2018).
16. Jongseong Choi, **Chul Min Yeum**, Shirley J. Dyke, and Mohammad R. Jahanshahi, “Computer-Aided Approach for Rapid Post-Event Visual Evaluation of a Building Façade,” *Sensors*, 18, 3017 (2018).
17. **Chul Min Yeum**, Shirley J. Dyke, and Julio A. Ramirez, “Visual Data Classification in Post-Event Building Reconnaissance,” *Engineering Structures* 155 (2018): 16-24.
18. Hacker, Thomas, Shirley Dyke, Ali Irmak Ozdagli, Gemez Marshall, Christopher Thompson, Brian Rohler, and **Chul Min Yeum**, “A Researcher-oriented Automated Data Ingestion Tool for rapid data Processing, Visualization and Preservation,” *Advances in Engineering Software* 114 (2017): 134-143.
19. **Chul Min Yeum**, Jongseong Choi, and Shirley J. Dyke, “Autonomous image localization for visual inspection of civil infrastructure,” *Smart Materials and Structures* 26, no. 3 (2017).
20. **Chul Min Yeum**, Shirley J. Dyke, Ricardo E. Basora Rovira, Christian Silva, and Jeff Demo, “Acceleration-Based Automated Vehicle Classification on Mobile Bridges,” *Computer-Aided Civil and Infrastructure Engineering* 31, no. 11 (2016): 813-825.
21. **Chul Min Yeum** and Shirley J Dyke, “Vision-Based Automated Crack Detection for Bridge Inspection,” *Computer-Aided Civil and Infrastructure Engineering* 30, no. 10 (2015): 759-770. Recipient of 2015 Innovation Award for this journal
22. **Chul Min Yeum**, Hoon Sohn, Hyung Jin Lim, and Jeong Beom Ihn, “Reference-Free Delamination Detection Using Lamb Waves,” *Structural Control and Health Monitoring* 21, no. 5 (2014): 675-684.
23. Hyung Jin Lim, Hoon Sohn, **Chul Min Yeum**, and Ji Min Kim, “Reference-Free Damage Detection, Localization, and Quantification in Composites,” *The Journal of the Acoustical Society of America* 133, no. 6 (2013): 3838–3845.
24. Byeongjin Park, Hoon Sohn, **Chul Min Yeum**, and Thanh C Truong, “Laser Ultrasonic Imaging and Damage Detection for a Rotating Structure,” *Structural Health Monitoring* 12, no. 5–6 (2013): 494–506.
25. **Chul Min Yeum**, Hoon Sohn, Jeong Beom Ihn, and Hyung Jin Lim, “Instantaneous Delamination Detection in a Composite Plate Using a Dual Piezoelectric Transducer Network,” *Composite Structures* 94, no. 12 (2012): 3490–99.
26. Jungeun An, Raphael T. Haftka, Nam H. Kim, Fuh-Gwo Yuan, Byung Man Kwak, Hoon Sohn, and **Chul Min Yeum**, “Experimental Study on Identifying Cracks of Increasing Size Using Ultrasonic Excitation,” *Structural Health Monitoring* 11, no. 1 (2012): 95–108.
27. **Chul Min Yeum**, Hoon Sohn, and Jeong Beom Ihn, “Lamb Wave Mode Decomposition Using Concentric Ring and Circular Piezoelectric Transducers,” *Wave Motion* 48, no. 4 (2011): 358–370.

CONFERENCE PROCEEDINGS (40 published) *: direct- or co- supervision.

1. Rishabh Bajaj*, Zaid Abbas Al-Sabbag*, **Chul Min Yeum**, and Sriram Narasimhan, "Multi-Dimensional Structural Assessment with a Mobile Scanning Device," *Transforming Construction with Reality Capture Technologies*, University of New Brunswick, New Brunswick, Aug 23, 2022.
2. Zaid Al-Sabbag*, **Chul Min Yeum**, and Sriram Narasimhan, "Distributed Collaboration in Infrastructure Assessment through Mixed and Virtual Reality," *Transforming Construction with Reality Capture Technologies*, University of New Brunswick, New Brunswick, Aug 23, 2022.
3. Max Midwinter*, Zaid Abbas Al-Sabbag*, and **Chul Min Yeum**, "Unsupervised Semantic Segmentation with Pose Prior," *11th International Conference on Structural Health Monitoring of Intelligent Infrastructure (SHMII-11)*, Concordia University, Montreal, August 8, 2022.
4. **Chul Min Yeum**, Zaid Al-Sabbag*, Rishabh Bajaj*, Max Midwinter*, "Human-Machine Collaborative Infrastructure Assessment through Mixed and Virtual Reality," *Canada-Korea Conference on Science and Technology*, Niagara Falls, ON, July 4, 2022.
5. Niloofar Elyasi, Max Midwinter*, Eugene Kim, **Chul Min Yeum**, "Rapid Seismic Vulnerability of Low-Rise RC Buildings Using Machine Learning," *12 National Conference on Earthquake Engineering*, Salt Lake City, Utah, June 27, 2022.
6. Rishabh Bajaj*, Zaid Abbas Al-Sabbag*, **Chul Min Yeum**, Sriram Narasimhan, "Volumetric damage quantification for visual inspection," *8th World Conference on Structural Control and Monitoring, 2022*.
7. Zaid Abbas Al-Sabbag*, Max Midwinter*, **Chul Min Yeum**, Sriram Narasimhan, "Human-Machine and Human-Human Collaborative Inspection Through Extended Reality," *Engineering Mechanics Institute Conference, 2022*.
8. Jongseong Choi, Ju An Park*, **Chul Min Yeum**, Shirley J Dyke, "Similarity Learning to Building Search Capability: Post-event Image Data Application," *Asia Pacific Conference of the Prognostics and Health Management Society, Sep 9, 2021*.
9. Max Midwinter*, **Chul Min Yeum**, Eugene Kim, "Explainable Machine Learning for Seismic Vulnerability Assessment of Low-Rise Reinforced Concrete Buildings," *Canadian Society for Civil Engineering*, online, 2021.
10. Zaid Abbas Al-Sabbag*, Jason Paul Connelly, **Chul Min Yeum**, Sriram Narasimhan, "Real-time Quantitative Visual Inspection using an Extended Reality Headset," (short paper, presentation) 6th Annual Conference on Vision and Intelligent Systems, Waterloo, Ontario, Canada, Nov 25-27, 2020.
11. Ju An Park*, **Chul Min Yeum**, Trevor Hrynnyk, "Image Scale Estimation Using Surface Textures for Quantitative Visual Inspection," (short paper, presentation) 6th Annual Conference on Vision and Intelligent Systems, Waterloo, Ontario, Canada, Nov 25-27, 2020.
12. Juan Park*, **Chul Min Yeum**, Jongseong Choi, Xiaoyu Liu, "Automated Image Classification for Post-Earthquake Reconnaissance Images," (short paper, poster) 5th Annual Conference on Vision and Intelligent Systems, Waterloo, Ontario, Canada, Nov 26, 2019.
13. Shirley J. Dyke, Xiaoyu Liu, Jongseong Choi, **Chul Min Yeum**, Juan Park*, Ali Lenjani, Julio A. Ramirez, & Randall Poston, "Learning from Earthquakes Using the Automatic Reconnaissance Image Organizer," *submitted to the 17th World Conference on Earthquake Engineering*, Sendai, Japan, Sep 27- Oct 2, 2021 (postponed one year).
14. Ali Lenjani, Shirley Dyke, Ilias Bilionis, **Chul Min Yeum**, "Accelerating Post-Event Data Collection and Analysis Using Artificial Intelligence," (abstract) Tornado Hazard Wind Assessment and Reduction Symposium, IL, USA, Oct 14-15, 2019.

15. Ali Lenjani, **Chul Min Yeum**, Shirley Dyke, Ilias Bilonis, Jongseong Choi, Alana Lund, and Amin Maghareh, "Hierarchical Convolutional Neural Network for Activity Source Detection in Building Floors," Proceedings of the 12th International Workshop on Structural Health Monitoring, Stanford, CA, September 10-12, 2019.
16. Xiaoyu Liu, **Chul Min Yeum**, Shirley J. Dyke, Ali Lenjani, and Jongseong Choi, "Automated Image Localization and 3D Reconstruction for Post-Event Building Reconnaissance," (abstract) the Engineering Mechanics Institute Conference (EMI), CA, USA, June 18-21, 2019.
17. Ali Lenjani, **Chul Min Yeum**, Shirley J. Dyke, and Ilias Bilonis, "Automated Pre-disaster Building Images Extraction from Street View Imagery," (abstract) Tornado Hazard Wind Assessment and Reduction Symposium, IL, USA, Sep 26-27, 2018.
18. Jongseong Choi, **Chul Min Yeum**, Shirley Dyke, Mohammad Jahanshahi, and Gun Wook Park, "Rapid Vision-Based Inspection of Nonstructural Components in Buildings," Proceedings of the 9th European Workshop on Structural Health Monitoring, Manchester, UK, July 10-13, 2018.
19. **Chul Min Yeum**, Ali Lenjani, Shirley J. Dyke and Ilias Bilonis, "Automated Detection of Pre-Disaster Building Images from Google Street View," (short paper) the 7th World Conference on Structural Control and Monitoring, Qingdao, China, July 22-25, 2018.
20. Shirley J. Dyke, **Chul Min Yeum**, Mathieu Gaillard, Bedrich Benes, Thomas Hacker, Alana Lund, Ali Lenjani, Julio Ramirez, "The Automated Reconnaissance Image Organization Tool," (abstract) the 43th Annual Natural Hazards Research and Applications Workshop, Colorado, USA, July 8-11, 2018.
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