

JONGSEONG BRAD CHOI, Ph.D.

Assistant Professor
Department of Mechanical Engineering
The State University of New York, SUNY Korea
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RESEARCH INTERESTS

Visual Analytics; Structural Health Monitoring; Prognostics and Health Management; Computer Vision; Deep Learning; Photogrammetry; Aerial Manipulation; Hypersonic Propulsion; Compressible Flow

EDUCATION

PhD., Mechanical Engineering, Purdue University, West Lafayette, IN, USA 05/2020
✚ Dissertation: *Automating Visual Data Collection and Analytics toward Lifecycle Management of Engineering Systems*

MSc., Mechanical Engineering, University of Mississippi, University, MS, USA 05/2014
✚ Thesis: *Parametric Scramjet Analysis*

BSc., Mechanical Engineering, University of Mississippi, University, MS, USA 05/2012

EMPLOYMENT HISTORY

Assistant Professor, Department of Mechanical Engineering 08/2020 – Present
The State University of New York, SUNY Korea, Incheon, South Korea

Research Assistant Professor, Department of Mechanical Engineering 08/2020 – Present
The State University of New York, Stony Brook University, Stony Brook, USA

Graduate Research Assistant, School of Mechanical Engineering 08/2014 – 05/2020
Purdue University, West Lafayette, IN, USA

Graduate Research and Teaching Assistant, Department of Mechanical Engineering 08/2012 – 05/2014
University of Mississippi, University, MS, USA

PROFESSIONAL POSITION

Committee, Board of Finance 01/2022 – Present
The Korean Society of Mechanical Engineers (KSME) – Division of Reliability Engineering, South Korea

Chair Committee, Board of Internal Business 01/2021 – Present
The Korean Society of Prognostics and Health Management (KSPHM), South Korea

Short Course Committee 01/2021 – 09/2021
International Conference on Prognostics and Health Management Asia-Pacific 2021

RESEARCH PROJECTS (Total held amount **1,028 million KRW (857k USD)** as PI and co-PI, 1 USD = 1,200 KRW)

23. **(PI) Development of a 3D-based Ship Assessment Platform and Utilization through Web Service**, supported by **KR** (Korean Register of Shipping), awarded funding of 44 million KRW (equivalent to 36.7k USD) *03/2024 – 10/2024 (ongoing)*
22. **(PI) True Twin: Development of Image-based Indoor 3D Modeling Technique for Facility Digital Twin Models**, supported by **MDS Intelligence Inc.**, awarded funding of 60.5 million KRW (equivalent to 50.4k USD) *11/2023 – 2/2024*
21. **(PI) 2023 Global Product Service Localization Research**, supported by **ITP** (Incheon Technopark), awarded funding of 5 million KRW (equivalent to 4.2k USD). *08/2023 – 10/2023*
20. **(PI) Remote Inspection for Shipment Engine Reliability exploiting Metaverse and Digital Twin Models**, supported by **KR** (Korean Register of Shipping), awarded funding of 44 million KRW (equivalent to 36.7k USD) *05/2023 – 12/2023*
19. **(PI) 2023 Steam Activity Research Program for Incheon Academy of Science & Arts (IASA)**, supported by **IASA**, awarded funding of 16 million KRW (equivalent to 13.3k USD). *03/2023 – 12/2023*
18. **(PI) 2022 Global Product Service Localization Research**, supported by **ITP** (Incheon Technopark), awarded funding of 5 million KRW (equivalent to 4.2k USD). *09/2022 – 12/2022*
17. **(PI) Emulation and Enhancement of Human Capability on Infrastructure Assessment: Engineering Soft-Power Engaged Monitoring and 3 Major Techniques** supported by **NRF** (National Science Foundation of Korea) under Grant No. NRF-2022R1F1A106361711, awarded funding amount of 101.43 million KRW (equivalent to 84.5k USD). *06/2022 – 02/2024*
16. **(PI) Development of An Integrated MCU (Mechanical Control Units) Component and Module Corresponding to Smart-Car Complex Control System** supported by **ITP** (Incheon Technopark), awarded funding of 28 million KRW (equivalent to 23.3k USD). *05/2022 – 12/2022*
15. **(PI) Space Exploration and In-Situ Resource Utilization Center (SRC)** supported by **NRF** (National Research Foundation of Korea) under Grant No. NRF-2022M1A3C2085237, awarded funding of 475 million KRW (equivalent to 395.8k USD). *04/2022 – 12/2026 (ongoing)*
14. **(PI) Development of IMU-based self-stabilizing autonomous guided vehicle (AGV) control system and hardware** supported by **AIDL co.**, awarded funding of 5.7 million KRW (equivalent to 4.8k USD). *03/2022 – 07/2022*
13. **(PI) 2021 Global Product Service Localization Research**, supported by **ITP** (Incheon Technopark), awarded funding of 10 million KRW (equivalent to 8.3k USD). *10/2021– 12/2021*
12. **(PI, Equipment Grant) Two Electric Rover Vehicles, Velodyne LiDar Puck, and RTKGPS Sensor**, supported by **KICT** (Korea Institute of Civil Engineering and Building Technology), awarded funding equivalent to 53 million KRW (equivalent to 44.2k USD). *06/2021 – 06/2025 (ongoing)*
11. **(Co- PI) XR based Intuitive Inventory System for Smart Factory**, supported by **RAPA** (Korea Radio Promotion Association), awarded funding of 200 million KRW (equivalent to 167k USD), 3 conference paper published **[C6],[C7],[C8]**. *04/2021 – 12/2021*
10. **(PI) Automating Visual Assessment of Infrastructure exploiting Computer Vision and Big Visual Data**, supported by **NRF** (National Science Foundation of Korea) under Grant No. NRF-2021R1G1A1012298, awarded funding of 30 million KRW (equivalent to 25k USD), 1 journal paper published **[J10], [A1]**. *03/2021 – 03/2022*

9. **Integrating Human and Machine for Post-Disaster Visual Data Analytics**, supported by NSF under Grant No. NSF-1835473, 2 journal paper published [J7], [J9]; 1 journal paper accepted [J10]; 1 conference paper accepted [C9]; 1 proposal submitted [P5]. 01/2019 – 05/2020
8. **STORM: Safeguarding Cultural Heritage through Organizational Resources Management**, collaborated with EU (European Union) under Grant No. H2020 n. 700191, 1 conference paper published [C4]; 1 journal paper under review [J13]. 04/2017 – 05/2020
7. **RETH: Resilience ExtraTerrestrial Habitat**, supported by New Horizon Program at Purdue University and NASA (The National Aeronautics and Space Administration), 3D models & videos were published in numerous articles worldwide (e.g., usatoday.com, space.com, etc.); Available in <https://phys.org/news/2019-07-humans-lava-tubes-moon.html>, 1 conference paper published [C5]. 08/2018 – 01/2019
6. **Active Citizen Engagement to Enable Lifecycle Management of Infrastructure Systems**, supported by NSF under Grant No. NSF-1645047, 2 journal paper published [J6], [J8]. 05/2017 – 08/2018
5. **Vision-based Visual Inspection System for A Large Number of Aerial Images**, 1 journal paper published [J6]; 1 proposal funded [P5] 01/2017 – 12/2017
4. **Sensor Integrated Autonomous Flight UAV System Development**, 2 proposals generated [P1], [P2] 05/2016 – 05/2021
3. **Automated Region-of-Interest Localization and Classification for Facility Visual Assessment**, 1 journal paper published [J5]; 1 conference paper published [C2]. 05/2015 – 05/2017
2. **Image-Based Collection and Measurements for Construction Pay Items**, supported by INDOT (Indiana Department of Transportation) under Grant No. SPR-4006, 1 journal paper published [J4]; 1 conference paper published [C1]; 1 technical Report published [C3]. 05/2015 – 08/2017
1. **Parametric Analysis of Scramjet Engine Varying Material and Fuel (Research Assistant)**, supported graduate program by University of Mississippi, 3 journal papers published [J1], [J2], [J3]; 1 Master thesis generated 08/2012 – 05/2014

TEACHING RECORDS

Course Teaching

MEC 559: (Graduate Course) Mobile Robotics and Autonomous Vehicle – Computer Vision and Control at the State University of New York, SUNY Korea	Sp 24
MEC 510: (Graduate Course) Object-Oriented Programming for Scientists and Engineers – Visual Analytics for Mechanical Engineers at the State University of New York, SUNY Korea	Sp22, 23, 24
MEC 410: Design of Machine Elements at the State University of New York, SUNY Korea	Sp22, 23
MEC 301: Thermodynamics at the State University of New York, SUNY Korea: Recorded the highest course evaluation score in the department	Fa20, 21, 22, 23
MEC 320: Numerical Methods in Engineering Design and Analysis at the State University of New York, SUNY Korea	Fa21, 22, 23
MEC 363: Mechanics of Materials at the State University of New York, SUNY Korea	Sp21

Student Advising

RAs - Ph.D. Course, the State University of New York, SUNY Korea

- **Jonathan Boyack:** Smart and resilience city application exploiting visual data and computer vision techniques 2020.08 – Present
- **Ricardo Ortiz:** Development of RKTGPS-based Autonomous vehicle using ROS 2024.01 – Present
- **Hansol Lim:** NeRF-based 3D Video Generation 2024.07 – Present

RAs - Master's Course, the State University of New York, SUNY Korea

- **Hanbeom Chang:** Development of LiDAR-RGB sensing system 2023.02 – Present
- **Alfredo Valenzuela:** Long-distance monitoring using PTZ camera sensing 2022.08 – Present
- **Jee Won Lee:** Camera modules and controls development for long-distance assessment 2022.03 – Present
- **Hansol Lim:** NeRF-based 3D Video Generation (**Graduated**) 2022.08 – 2024.06
- **Ricardo Ortiz:** RTKGPS-based autonomous driving (**Graduated**) 2021.08 – 2023.12

RAs - Undergraduate Course Present

- **Soo-Jung Chi:** LiDAR-RGB 3D Modeling of a Large Facilities 2024.01 – Present
- **Hojin Song:** Vision-based Autonomous Vehicle 2024.01 – Present
- **Eunjae Lee:** 3D Reconstruction and Vision Sensing 2024.01 – Present
- **Sooyeon Yang:** Visual Analytics and Sensing 2024.01 – Present
- **Yoonseong Kim:** True Twin – Precise Indoor Mapping through Photogrammetry 2023.07 – Present
- **Sambridha Bhattarai:** Hexabot Control and Manipulation 2023.07 – Present

Dissertation Committee Chair, Ph.D. Student, the State University of New York, SUNY Korea

- **Mark Anthony Rotor:** Designing tidal turbine (HATT) blades utilizing Artificial Neural Network (ANN) where I serve as chair of the committee 2021.01– 2023.08
- **Saebom Jin:** Breaking the Vicious Cycle: How Vulnerable Cities Can Develop Smart and Sustainable with Adaptation Planning 2023.04– 2023.12

Theis Committee Member, Master Student, the State University of New York, SUNY Korea

2021.08– 2023.06

- **Suyeon Lee:** Prognostics using Nonlinear Cumulative Damage Model for Electronic Devices where I serve as member of the committee

Supervisee Graduations, the State University of New York, SUNY Korea

- **Hye Jee Chang:** Visual Analytics (Fa20, Sp21), Georgia Tech, Undergrad's program, USA
- **Pureun Jeong:** Visual Analytics (Fa21, Sp22), Yujin Robotic Co. South Korea
- **Sooyon Chang:** SLAM for visual assessment (Fa20, Sp21, Fa21), Purdue Univ., Ph.D. program, USA
- **Hyunseung Cha:** Motor driver development for EV (Fa20, Sp21, Fa21), Army Service, South Korea
- **Hansol Lim:** EV system for visual assessment (Fa20, Sp21), SUNY Korea, Master's program, South Korea
- **Prince-David Malendele:** SLAM for visual assessment (Fa20, Sp21), Brookhaven Natl. Lab., USA
- **Jimin Shin:** Lidar sensing and rover control (Sp22, Fa22), SUNY Korea, Master's program, South Korea
- **Seunghyun Cha:** Lidar sensing and rover control (Sp22, Fa22), KT Co., South Korea
- **Dannielle Macmaster:** Aerospace metabus platform development (Sp23, Fa23), undecided
- **Leeloy Makusha:** Aerospace metabus platform development (Sp23, Fa23), undecided
- **Jaewon Lee:** PTZ Camera Control (Fa22, Sp23), SUNY Korea, Master's program, South Korea

Research Mentor, Undergraduate Research Course, Purdue University

- **Wookjin Chung:** 6 credits of undergraduate research (Sp2018, Fal2019)
- **Jonghyun Park:** 6 credits of undergraduate research (Sp2018, Fa2019)
- **Gun Wook Park:** 6 credits of undergraduate research (Sp2017, Fa2017)
- **Sharda Parth:** 3 credits of undergraduate research (Sp2018)

- **Yisong Yin:** 6 credits of undergraduate research (Fa2016, Sp2017)

Curriculum Development and Educational Service

High School Credit System and Curriculum

2016 – 2017

- Chosen and served as an instructor for the 16-hour course “Computer Vision and Sustainable Cities Applications” organized by Incheon Metropolitan City Office of Education

TRAILS: Teachers and Researchers Advancing Integrated Lessons in STEM, *Purdue University*

2016 – 2017

- Supported by NSF under Grant No. NSF-1513248
- Participated as a graduate research assistant in promoting practices that increase students' motivations and capacities to pursue careers in STEM area.

SLED: Science Learning through Engineering Design, *Purdue University*

2015- 2016

- Supported by NSF under Grant No. NSF-0962840
- Participated as a graduate research assistant in collaboration between STEM disciplinary faculty and grades 3-6 teachers.

SYNERGISTIC LEADERSHIP POSITION

Organizing Committee & Session Organizer & Session Chair for a Conference

- **AeroNDT 2023, Busan, South Korea** 11/2023
- **KSME Annual Meeting 2023, Incheon, South Korea** 11/2023
- **PHM Korea 2023, Seoul, South Korea** 07/2023
- **KSME-Reliability Division Annual Meeting 2023, Jeju, South Korea** 03/2023
- **KSME Annual Meeting 2022, Jeju, South Korea** 11/2022
- **PHM Korea 2022, Seoul, South Korea** 07/2022
- **KSME-Reliability Division Annual Meeting 2022, Jeju, South Korea** 03/2022
- **PHM Korea 2021, Jeju, South Korea** 07/2021
- **PHM Asia-Pacific 2021, Jeju South Korea** 07/2021

Banquet Master & MC for a Conference

- **AeroNDT 2023, Busan, South Korea** 11/2023
- **PHM Korea 2023, Seoul, South Korea** 07/2023

Seminar Organizer

Human-Machine Collaboration through MR & VR, SUNY Korea, Incheon, South Korea

10/2022

- Hosted Prof. Chul Min Yeum, University of Waterloo, to hold an open seminar to SUNY Korea community

Lecture Series Co-Organizer

Twice every year

Annual PHM Lecture Series for Industry, Yonsei University, Seoul, South Korea

- Assisted organizing 3-days lecture series and was in charge of generating and online publishing high-quality video disseminating PHM workflow

Session Chair

07/2022

Korean Society of Prognostics and Health Management (KSPHM) 2022, Seoul, South Korea

- Served as a chair of the session "Future Mobility and Battery"

Colloquium Organizer

06/2022

Two Departments Collaborating Seminar (Biomedical Engineering at Purdue Univ. and Mechanical Engineering at SUNY Korea), SUNY Korea, Incheon, South Korea

- Hosted 6 prestigious scholars for this colloquium (3 from Purdue and 3 from SUNY Korea) to share ideas with SUNY Korea students and searching future collaboration between two institutions

Workshop Director

04/2019

4th Midwest Smart Structure Colloquium at *Purdue University*, West Lafayette, IN, USA

- Organize, design, and direct a 3-days colloquium with 50 participants which is held in Bowen Laboratory at Purdue University

HONORS & AWARDS

Awards

Outstanding Thesis Award from Korean Society of Mechanical Engineers (KSME) Reliability Division 2024 03/2024

- Mr. Ricardo Ortiz's Master's Thesis entitled "Autonomous Manipulation of Unmanned Ground Vehicle (UGV) with an User-Guided-Path on a Map: Quantitative Simulation and Analysis", supervised by **Jongseong Choi**, received the Outstanding Thesis Award.

Outstanding Paper Award from the 14th International Symposium on NDT in Aerospace (AeroNDT2023) 11/2023

- The paper entitled "Real-Time 3D Video Generation Using NeRF", authored by Hansol Lim and **Jongseong Choi***, received the outstanding paper award. Only 4 papers were selected for this award among all papers submitted to the conference.

Outstanding Paper Award from the 14th International Symposium on NDT in Aerospace (AeroNDT2023)

- The paper entitled "Region of Interest Locator with Digital Twin Model Generation of Large-Scale Facility", authored by Jonathan Boyack, Hansol Lim, Alfredo Valenzuela, **Jongseong Choi***, Sangho Song, Yongseok Choi, and Dongguk Im, received the best paper award. Only 10 papers were selected for this award among all papers submitted to the conference. 11/2023

Excellent Presentation Award from Korean Society of Mechanical Engineers (KSME) Annual Meeting 2023 11/2023

- The paper entitled "Seamless 3D Scene Control of NeRF Generated Digital Twin Environments", authored by Hansol Lim and **Jongseong Choi***, received the Excellent Presentation Award.

Best Paper Award from Korean Society of Mechanical Engineers (KSME) Annual Meeting 2023 11/2023

- The paper entitled "Falling Hazard Assessment Application: Automated Labelling Large Data Sets for Transfer Learning Models", authored by Jonathan Boyack and **Jongseong Choi***, received the Best Paper Award.

Outstanding Project Award from Incheon Technopark (ITP) 11/2023

- The team MEIC (Ricardo Ortiz, Jonathan Boyack, Alfredo Valenzuela, and Sambridha Bhattarai, supervised by Prof. Brad Choi, won "2023 Global Product-Service Localization Research Award Competition" held by ITP

The Promising Scientist Award from PHM Korea 2023 07/2023

- His talk is entitled "Engineering-Soft-Power engaged visualization analytics and human-machine collaboration remote assessment for large-scale structures" and won the Young Scientist Award.

07/2023

Best Paper Award from Annual Conference of the PHM Korea Society (PHM Korea 2023)

- The paper entitled "Real-Time, Non-Intrusive Inspection of Structures and Machines Using Visual Analytics and SfM-Based Digital Twin Generation", authored by Hansol Lim and **Jongseong Choi***, received the Best Paper Award.

Best Paper Award from *Korean Society of Mechanical Engineering (KSME) Annual Meeting 2022, KSME*

11/2022

- The paper entitled "A Real-Time Log Data Analytics-based Electric Vehicle Path Optimization", authored by Jonathan Boyack and **Jongseong Choi*** won the best paper award. Only 2 papers were selected for this award among all papers submitted to the Reliability Division in KSME.

Best Paper Award from *Korean Society of Mechanical Engineering (KSME) Annual Meeting 2022, KSME*

11/2022

- The poster entitled "Indoor Navigation System Designed for a Safety of Construction Site", authored by Pureun Jeong, Jimin Shin, Seung Hyun Cha, **Jongseong Choi*** won the best paper award. Only 2 papers were selected for this award among all papers submitted to the Reliability Division in KSME.

Outstanding Project Award from Incheon Technopark (ITP)

- The team MEIC (Jonathan Boyack, Ricardo Ortiz, and Jee Won Lee, supervised by Prof. Brad Choi, won "2022 Global Product-Service Localization Research Award Competition" held by ITP

11/2022

Travel Award & Workshop Invitation from *NHERI RAPID Experimental Facility, NSF*

07/2019

- This award selects 20 attendees who has professional research background for the RAPID 4 days Equipment Training Workshop at the University of Washington, Seattle, as well as support up to \$1,500 Travel Fund.

Travel Award for Conference from *College of Engineering, Purdue University*

05/2018

Honorable Mentions from 3rd Midwest Smart Structure Colloquium, *University of Illinois (UIUC)*

10/2017

- This award recognizes excellence PhD candidates supporting up to \$1,000 for 2019 EWSHM conference at Hilton Hotel, Manchester, UK

Resident Assistant Scholarship from University of Mississippi

08/2012 – 08/2013

Honor Program Scholarship from University of Mississippi

01/2011

- This scholarship is awarded to prominent undergraduate students in the School of Engineering.

PROFESSIONAL TALKS & PRESENTATION

[T17] Invited Speaker, "Remote Sensing through Engineering-Soft-Power", Korea Electronics Technology Institute (KETI), South Korea	12/2024
[T16] Invited Speaker, "A Real-Time Log Data Analytics-based Electric Vehicle Path Optimization", Argonne National Lab., IL, USA	05/2023
[T15] Invited Guest Lecturer, "Human-Machine Collaborative Remote Monitoring and Sensing", Korean Register, Busan, South Korea	12/2022

[T14]	Invited Guest Lecturer , “Human-Machine Collaborative Remote Monitoring and Sensing”, ME Seminar Series, Hanyang University, Seoul, South Korea	11/2022
[T13]	Invited Guest Lecturer , “Computer Vision engaged Infrastructure Remote Sensing”, Dept. Architecture Engineering Seminar Series, Inha University, Incheon, South Korea	11/2022
[T12]	Invited Speaker , “Citizen Engaged Infrastructure Assessment and Remote Sensing”, Young Promising Scientists Session (유망과학자 세션), Korean Society of Mechanical Engineers (KSME) Annual Conference 2022, Jeju, South Korea	11/2022
[T11]	Invited Guest Lecturer , “Cultural Heritage Long-term Preservation and Monitoring”. National Museum of Modern and Contemporary Art, Cheongju, South Korea	09/2022
[T10]	Invited Guest Lecturer , “Citizen Engaged Infrastructure Assessment and Remote Monitoring”, Artificial Intelligence Winter School, The Korean Society for Mechanical Engineers (KSME) – AI-Machine Research Group, KAIST, Daejeon, South Korea	02/2022
[T9]	Research Seminar , “AI to Enable Water Quality Control”, Magpiesoft co., Daejeon, South Korea	02/2022
[T8]	Research Seminar , “AI for Possible Military Applications”, HANCOM Intelligence co., Seongnam, South Korea	11/2022
[T7]	Research Seminar , “Citizen Engaged Building Cultural Heritage Management”, Incheon City Hall, Incheon, South Korea	11/2021
[T6]	Invited Speaker , “Automating Visual Data Analytics to Aid Lifecycle Management of Infrastructure toward Sustainable Cities”, Conference on Toward ‘Ontact’ Industries through PHM (PHM Korea 2021), Korea Society for Prognostics and Health Monitoring (KSPHM), Jeju, South Korea	09/2021
[T5]	Research Seminar , “Infrastructure Management with Automated Vision Systems”, Incheon City Museum, Incheon, South Korea	10/2021
[T4]	Research Seminar , “Vision-based visual inspection for large-scale infrastructure”, Korea Institute of Construction Technology (KICT), Ilsan, South Korea	09/2020
[T3]	Research Seminar , Midwest Smart Structure Colloquium (MSSC), Midwest area US	10/16, 10/17, 4/19
[T2]	Research Seminar , 9th European Workshop on SHM, Manchester, UK, July	08/2018
[T1]	Poster Session , Herrick board meeting, West Lafayette, IN, USA	11/2015, 11/2016, 11/2018

PATENTS

[A1]	Jongseong Choi* (2021.11), Computer Vision Technique to Extract Structural Information from Citizen Science Data: Automated Lifecycle Infrastructure Monitoring Application. Korean Patent No. 10-2021-1068454	11/2021
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BOOK CHAPTER

[B1]	Changwoon Han and Jongseong Choi (2022.10). Chapter 10: Information of PHM research and facilities, <i>PHM BOK Guide: Prognostics and Health Management Body of Knowledge</i> (pp. 307-345). Hongreung Publishing. ISBN: 979-11-5600-966-5
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PEER-REVIEWED JOURNAL PAPERS (18 published, 2 accepted, 6 under review); *corresponding author

[J26]	Hansol Lim, Jongseong Choi* , Hanbeom Chang, Chul Min Yeum (2024), LiDAR-3DGS: LiDAR Reinforced 3D Gaussian Splatting for Multimodal Radiance Field Rendering, <i>IEEE Transactions on Pattern Analysis and Machine Intelligence</i> . (under review)
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- [J25] Jonathan Boyack, **Jongseong Choi*** (2024), Jongryeol Jeong, Hyungchai Park, and Sewhan Kim (2024), LogPath: Log Data Based Energy Consumption Model Analysis to Enable Path Optimization of an Electric Vehicle, *Transportation Research Part D: Transport and Environment*. doi: [10.2139/ssrn.4813786](https://doi.org/10.2139/ssrn.4813786) (under review)
- [J24] Jonathan Boyack, **Jongseong Choi***, Sambridha Bhattarai, Alfredo Valenzuela, Hansol Lim, Sangho Song, and Hwasup Jang (2024), Digital Twin for Region of Interest Inspection of a Ship Engine Generated using Photogrammetry for Reliability and Education, *Visual Informatics*. (under review)
- [J23] Ricardo Ortiz, **Jongseong Choi***, Alfredo Valenzuela (2024), Unmanned guided vehicle (UGV) through Real Time Kinematics and Mapping API localization, *Robotics and Autonomous Systems*. (under review)
- [J22] Jonathan Boyack and **Jongseong Choi*** (2024), Photogrammetry Engaged Automated Image Labeling Approach, *Structural Health Monitoring*. (under review)
- [J21] Francisco Yumbra*, Marcelo Fajardo, Anthony Piguave, Diego Ronquillo, Ricardo Ortiz, **Jongseong Choi**, Gabriel Diaz, and Xicu Garcia (2024), An Open-Source Multi-Robot Framework System for Collaborative Environments based on ROS2, *IEEE Access*. (under review)
- [J20] Ricardo Ortiz, **Jongseong Choi***, Alfredo Valenzuela, Francisco Yumbra, Taewook Kang, Okhue Cho, Jong-Eun Park, and Chul Min Yeum (2024), Autonomous Manipulation of Unmanned Ground Vehicle (UGV) with a User-Guided-Path on a Map: Quantitative Simulation and Analysis, *Mathematics*. (accepted)
- [J19] Lissette Iturburu, Xiaoyu Liu, Xin Zhang, Benjamin E. Wogen, Juan Nicolas Villamizar, Shirley J. Dyke, Julio Ramirez, **Jongseong Choi***, and Gianella Valencia, Sergio M. Alcocer (2024), Building Pose Detection for the Characterization of Reinforced Concrete Buildings, *The Structural Design of Tall and Special Buildings*, e2020, doi: [10.1002/tal.2120](https://doi.org/10.1002/tal.2120)
- [J18] Benjamin E. Wogen, **Jongseong Choi***, Xin Zhang, Xiaoyu Liu, Lissette Iturburu, and Shirley J. Dyke (2024), Automated Bridge Inspection Image Retrieval Based on Deep Similarity Learning and GPS. *Journal of Structural Engineering*, 150(3), 04023238. doi: [10.1061/JSENDH.STENG-12639](https://doi.org/10.1061/JSENDH.STENG-12639)
- [J17] Ok-Hue Cho and **Jongseong Choi*** (2024), "A Comparative Analysis of IoT based Network Anomaly Detection and Prediction Using Vector Autoregressive Models", *Journal of Machine and Computing*, 127-137. doi: [10.53759/7669/jmc202404013](https://doi.org/10.53759/7669/jmc202404013).
- [J16] Alfredo Valenzuela, **Jongseong Choi***, Ricardo Ortiz, Byungkon Kang, Michael Kim, and Taewook Kang (2023), Development of Mobile App to Enable Local Update on Mapping API: Construction Sites Monitoring Through Digital Twin, *Electronics*, 12(23), 4738. doi: [10.3390/electronics12234738](https://doi.org/10.3390/electronics12234738)
- [J15] Xiao-Le Han, Toshiro Hata, **Jongseong Choi**, Yan-Jun Du, Yi-Jie Wang, & Ning-Jun Jiang* (2023), Deep Learning Based Approach for Automated Characterization of Large Marine Microplastic Particles, *Marine Environmental Research*, 183, 105829. doi: [10.1016/j.marenvres.2022.105829](https://doi.org/10.1016/j.marenvres.2022.105829)
- [J14] Xiaoyu Liu, Shirley J. Dyke*, Ali Lenjani, Ilias Bilionis, Xin Zhang, & **Jongseong Choi** (2023), Automated Image Localization to Support Rapid Building Reconnaissance in a Large-scale Area, *Computer-Aided Civil and Infrastructure Engineering*, 38(1), 3-25. doi: [10.1111/mice.12828](https://doi.org/10.1111/mice.12828) (IF: 11.775, JCR top 0.72%)
- [J13] Ju An Park, Xiaoyu Liu, Chul Min Yeum*, Shirley J. Dyke, Max Midwinter, Chungwook Sim, **Jongseong Choi**, Zhiwei Chu, Thomas Hacker, & Bedrich Benes (2022), Multioutput Image Classification to Support Post-Earthquake Reconnaissance, *Journal of Performance of Constructed Facilities*, 36(6), 04022063. doi: [10.1061/\(ASCE\)CF.1943-5509.0001755](https://doi.org/10.1061/(ASCE)CF.1943-5509.0001755) (Editor's Choice Selection)
- [J12] Xiao-Le Han, Ning-Jun Jiang*, Yu-Fei Yang, **Jongseong Choi**, Devandra N. Singh, Yan-Jun Du, & Yi-Jie Wang (2022), Deep Learning Approach for the Detection and Instance Segmentation of Clayey Soil Desiccation Crack, *Computers and Geotechnics*, 146, 104733. doi: [10.1016/j.compgeo.2022.104733](https://doi.org/10.1016/j.compgeo.2022.104733)
- [J11] **Jongseong Choi***, Lazaros Toumanidis, Chul Min Yeum, Patrikakis Charalampos, Ali Lenjani, Xiaoyu Liu, Panagiotis Kasnesis, Ricardo Ortiz, Nin-Jun Jiang, & Shirley J. Dyke (2022), Automated Graffiti Detection: Automated Graffiti

Detection: A Novel Approach for Maintaining Historical Architectures in Community, *Applied Sciences*, 12(6), 2983. doi: [10.3390/app12062983](https://doi.org/10.3390/app12062983)

- [J10] **Jongseong Choi***, Ju An Park, Shirley J. Dyke, Chul Min Yeum, Xiaoyu Liu, Ali Lenjani, & Ilias Bilonis (2022), Similarity Learning to Enable Building Searches in Post-event Image Data, *Computer-Aided Civil and Infrastructure Engineering*, 37(2), 261-275. doi: [10.1111/mice.12698](https://doi.org/10.1111/mice.12698) (IF: 11.775, JCR top 0.72%)
- [J9] Xiaoyu Liu, Shirley J. Dyke*, Chul Min Yeum, Ilias Bilonis, Ali Lenjani, & **Jongseong Choi** (2020), Automated Indoor Image Localization to Support Post-Event Building Assessment. *Sensors*, 20(6), 1610. doi: [10.3390/s20061610](https://doi.org/10.3390/s20061610)
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CONFERENCE PROCEEDINGS & OTHER ARTICLES (28 published, 6 accepted); *corresponding author

- [C34] (Invited) **Jongseong Choi***, “Visual Analytics and Human-Machine Collaborative Remote Assessment Approach for Infrastructure Management”, 20th World Conference on Non-Destructive Testing 2024 (WCNDT 2024), May 27 – 31, 2024.
- [C33] Hansol Lim and **Jongseong Choi***, “NeRF Generated Digital Twin Model for Real-Time, Perspective-Free Visual Analytics”, 20th World Conference on Non-Destructive Testing 2024 (WCNDT 2024), May 27 – 31, 2024.
- [C32] Hanbeom Chang, **Jongseong Choi***, Ricardo Ortiz, and Chul Min Yeum, “Digital Twin Platform for Remote Assessment: Application in Extensive Ship Engine Inspection”, 20th World Conference on Non-Destructive Testing 2024 (WCNDT 2024), May 27 – 31, 2024.
- [C31] Alfredo Valenzuela, Jee Won Lee, Chul Min Yeum, Ricardo Ortiz, and **Jongseong Choi***, “Remote Monitoring Assessment Through Pan-Tilt-Zoom Automated Camera Control”, 20th World Conference on Non-Destructive Testing 2024 (WCNDT 2024), May 27 – 31, 2024.
- [C30] Jonathan Boyack, & **Jongseong Choi***, “Data Localization on A Digital Twin Model to Enable Remote Assessment: Implementation on a full-scale Ship Engine”, 20th World Conference on Non-Destructive Testing 2024 (WCNDT 2024), May 27 – 31, 2024.
- [C29] Ricardo Ortiz, Alfredo Valenzuela, and **Jongseong Choi***, “Enhanced Construction Site Monitoring with RTK-GPS Guided Unmanned Mobile Robot and Mapping API Integration”, 20th World Conference on Non-Destructive Testing 2024 (WCNDT 2024), May 27 – 31, 2024.

- [C28] **(Outstanding Paper Award)** Hansol Lim and Jongseong Choi*, Hansol Lim, Alfredo Valenzuela, and Hanbeom Chang, “Real-Time 3D Video Generation using NeRF”, The 14th International Symposium on NDT in Aerospace (AeroNDT2023), Busan, South Korea, Nov 5 – 8, 2023.
- [C27] **(The Best Paper Award)** Jonathan Boyack, Hansol Lim, Alfredo Valenzuela, Jongseong Choi*, Sangho Song, Yongseok Choi, and Dongguk Im, “Region of Interest Locator with Digital Twin Model Generation of Large-Scale Facility”, The 14th International Symposium on NDT in Aerospace (AeroNDT2023), Busan, South Korea, 5 – 8 Nov 2023.
- [C26] Alfredo Valenzuela, Jee Won Lee, Chul Min Yeum, Ricardo Ortiz, and Jongseong Choi*, “Automated Pan-Tilt-Zoom Camera Control to Enable Monitoring Assessment”, The 14th International Symposium on NDT in Aerospace (AeroNDT2023), Busan, South Korea, 5 – 8 Nov 2023.
- [C25] **(Best Paper Award)** Jonathan Boyack, & Jongseong Choi*, “Falling Hazard Assessment Application: Automated Labelling Large Data Sets for Transfer Learning Models”, Korean Society of Mechanical Engineers (KSME) Annual Meeting 2023, Incheon, South Korea, Nov 1 – 4, 2023.
- [C24] Alfredo Valenzuela, Ricardo Ortiz, Sambridha Bhattarai, and Jongseong Choi*, “Localize Map Update Mobile App to Enable Construction Sites Monitoring: User-Guided Path Generation for Robot Operation”, Korean Society of Mechanical Engineers (KSME) Annual Meeting 2023, Incheon, South Korea, Nov 1 – 4, 2023.
- [C23] **(Excellent Presentation Award)** Hansol Lim and Jongseong Choi*, “Seamless 3D Scene Control of NeRF Generated Digital Twin Environments”, Korean Society of Mechanical Engineers (KSME) Annual Meeting 2023, Incheon, South Korea, Nov 1 – 4, 2023.
- [C22] Hanbeom Chang, Jaewon Lee, Danielle Macmaster, Leeroy Makusha, Jongseong Choi*, and Chul Min Yeum, “Human-Machine Collaborative Platform in Metaverse”, Korean Society of Mechanical Engineers (KSME) Annual Meeting 2023, Songdo, South Korea, Nov 1 – 4, 2023.
- [C21] Alfredo Valenzuela and Jongseong Choi*, “Locally Update Scenes to Enable a User-Guided Path Planning”, Annual Conference of the PHM Korea Society (PHM Korea 2023), Seoul, South Korea, July 7 – 8, 2023.
- [C20] **(Best Paper Award)** Hansol Lim and Jongseong Choi*, “Real-Time, Non-Intrusive Inspection of Structures and Machines Using Visual Analytics and SfM-Based Digital Twin Generation”, Annual Conference of the PHM Korea Society (PHM Korea 2023), Seoul, South Korea, July 7 – 8, 2023.
- [C19] Ricardo Ortiz, Alfredo Valenzuela & Jongseong Choi*, “Development of RTK-GPS Engaged Autonomous Mobility: Implementation and Analysis for Structural Health Monitoring Application”, Advanced Smart Materials and Structures 2nd International Conference (ASMaS2023), Ho Chi Minh, Vietnam, Jun 28 – 30, 2023.
- [C18] Jonathan Boyack, & Jongseong Choi*, “An Automated Falling Hazard Assessment of High-Rise Buildings Using Transfer Learning and Orthophoto Generation”, Advanced Smart Materials and Structures 2nd International Conference (ASMaS2023), Ho Chi Minh, Vietnam, Jun 28 – 30, 2023.
- [C17] Jongseong Choi*, “Automating Visual Analytics to Aid Lifecycle Management of Infrastructure”, Structural Congress 2023, New Orleans, LA, May 3 – 6, 2023.
- [C16] Jeewon Lee, Hanbeom Chang, Jongseong Choi*, and Chul Min Yeum, “Automated Pan-Tilt-Zoom Camera Control Enabling Long-Range Visual Exploration for Extraterrestrial Missions”, Korean Society of Mechanical Engineers (KSME)-Reliability Division 2023, Jeju, South Korea, Mar 22 - 24, 2023.
- [C15] **(Best Paper Award)** Pureun Jeong, Hansol Lim, Jimin Shin, and Jongseong Choi*, “SLAM for Skid-Steering Mobile Robot Systems”, Korean Society of Mechanical Engineers (KSME)-Reliability Division 2023, Jeju, South Korea, Mar 22 - 24, 2023.
- [C14] Ricardo Ortiz, Jee Won Lee, Jonathan Boyack, & Jongseong Choi*, “Development of User-Designated-Path Driving Ground Robot for Construction Sites”, Korean Society of Mechanical Engineers (KSME) Annual Meeting 2022, Jeju, South Korea, Nov 9 – 12, 2022.

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- [C12] (**Best Paper Award**) Jonathan Boyack & **Jongseong Choi***, “A Real-Time Log Data Analytics-based Electric Vehicle Path Optimization”, Korean Society of Mechanical Engineers (KSME) Annual Meeting 2022, Jeju, South Korea, Nov 9 – 12, 2022.
- [C11] Jonathan Boyack & **Jongseong Choi***, “Electric Vehicle Path Optimization using Real-Time Log Data for Decision Making”, Annual Conference of the PHM Korea Society, Jun 29 – July 1, 2022.
- [C10] **Jongseong Choi** & Shirley J. Dyke*, “ARIO: Automatic Reconnaissance Image Organizer to Learn from Earthquake”, Annual Conference of Korean Society of Mechanical Engineers, Division of Reliability, Jeju, South Korea, Mar 23 – 25, 2022.
- [C9] 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,” Proceedings of 17th World Conference on Earthquake Engineering, Sendai, Japan, Sep 27- Oct 2, 2021.
- [C8] **Jongseong Choi*** & Jonathan Boyack, “Automating Visual Data Analytics to Aid lifecycle Management of Infrastructure toward Sustainable cities”, Annual Conference of the PHM Korea Society, Sep 8 – 10, 2021.
- [C7] **Jongseong Choi***, Ju An Park, Chul Min Yeum, & Shirley J Dyke, “Similarity Learning to Building Search Capability: Post-event Image Data Application”, Proceedings of Asia Pacific Conference of the Prognostics and Health Management Society 2021, Jeju, South Korea, Sep 8 – 11, 2021.
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- [C2] Chul Min Yeum*, **Jongseong Choi**, & Shirley J. Dyke (2017), “Automated Region-of-Interest Localization and Classification for Visual Assessment on Civil Infrastructure,” Proceedings of the 11th International Workshop on Structural Health Monitoring, Stanford, CA, September 12-14, 2017.
- [C1] Chul Min Yeum*, **Jongseong Choi**, & Shirley J. Dyke (2017), “Image Localization for Computer-enhanced Visual Inspection of Civil Infrastructure,” Proceedings of Engineering Mechanics Institute Conference, San Diego, CA, United States, June 4-7, 2017.

PROPOSAL DEVELOPMENT to U.S. GOVERNMENT (5 generated, 1 awarded).

<p>[P5] Active Citizen Engagement to Enable Lifecycle Management of Infrastructure Systems</p> <ul style="list-style-type: none"> • (Funded under Grant No. CMMI-1645047) Co-authored successful proposal with funded \$100,000 from National Science Foundation (NSF). 	<i>07/2016</i>
<p>[P4] Automating Damage Quantification, Localization and BIM Updating Using Optical Data</p> <ul style="list-style-type: none"> • Co-authored successful proposal and requested \$400,000 to National Science Foundation (NSF). 	<i>02/2020</i>
<p>[P3] HDBE (E-Defense): Enabling Building Damage Assessment by Engaging Remote Experts</p>	<i>01/2018</i>

- Co-authored and requested \$700,000 to National Science Foundation (NSF).
- [P3] **S&SA: Autonomous Infrastructure Inspection and Condition-Based Maintenance** *05/2017*
- Co-authored proposal and requested to National Science Foundation (NSF).
- [P1] **S&SA: Reconfigurable Aerial Robots for Intelligent Assessment to Industrial Disasters** *11/2016*
- Co-authored proposal and requested to National Science Foundation (NSF).