

# Jihoon Chung, WELL AP, LEED GA

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## CONTACT INFORMATION

Center for Architecture Science and Ecology  
Rensselaer Polytechnic Institute  
New York, United States

Tel: +1 (347) 204-2049  
E-mail: chungj11@rpi.edu  
<https://j-chung.kr/>

## RESEARCH INTERESTS

*Building Information Modeling / Internet of Things / Ontology Engineering*  
interoperability, technical specification, 3D concrete printing, digital fabrication, printing simulation analysis, spatial network analysis, parametric design, machine learning, deep learning, computer vision (object detection, facial recognition), natural language process (text classification)

## EDUCATION

### **Rensselaer Polytechnic Institute**, New York, United States

Ph.D., Architectural Science (Built Ecologies), August 2021 – Current

- Advisor: Dr. Dennis Shelden

M.S., Architecture (Design Technology), August 2021 – Current

- Advisor: Dr. Dennis Shelden

Graduate Certificates, January 2022 – Current

- Machine Learning & AI, Business Intelligence, and Systems Engineering

### **Yonsei University**, Seoul, Korea

M.S., Architectural Engineering (Construction IT), GPA: 3.97/4.0, February 2021

- Thesis: “Technical Specification Framework for 3D Concrete Printers”
- Advisor: Dr. Ghang Lee

B.Arch, Architecture (5-year program), February 2019

- Thesis: “Haebang-ro: Relationship between Haebang-chon and Yongsan Park”
- Advisor: Moongyu Choi, AIA & KIRA

### **National University of Singapore**, Singapore

Exchange Program for two semesters in AY2017

### **Gunmyungwon (건명원)**, Seoul, Korea

Future New School of Humanities, Arts & Science, February 2016

## RESEARCH & WORK EXPERIENCE

### **Center for Architecture Science and Ecology**, New York

**August 2021 – Current**

#### *Research Assistant*

- Developed a monitoring system for indoor air quality based on BIM & IoT sensors
- Researched on web data system for building information interoperability
- Taught a research-oriented class ‘Research Investigation’ in Fall semester 2022
- Work as a project mentor for undergraduates in an interdisciplinary project ‘Smart Dormitory Devices and Development System’ in Fall semester 2022 & Spring semester 2023

### **Saman Corporation**, South Korea

**February 2021 – August 2021**

#### *Researcher*

- Planned application services using real-time data collected from IoT sensors on construction sites in a national research project ‘Development of and digital twin platform for smart construction’
- Assisted to prepare kick-off meetings and presentations in a national research project ‘XR Flagship Project (Construction part)’

- Wrote bills of quantities in a pilot design project on a box culvert organized by Korea Expressway Corporation

**Building Informatics Group, Yonsei University**

**February 2018 – January 2021**

*Research Assistant*

- Proposed a technical specification framework for 3D concrete printers through a systematic literature review and a Delphi study
- Developed a multi-dimensional classification algorithm for housing defect text data using BERT-based multitask learning technique (Recurrent Neural Network)
- Explored optimization algorithm for buildability of 3D concrete printing focused on operation planning and concrete properties

**Yonsei University, South Korea**

**March 2019 – June 2020**

*Teaching Assistant*

- Assisted an undergraduate course on the 'Engineering-Information Processing' in Semester 1, AY2020
- Managed a computer lab for undergraduate students and the research group's website in Semester 1, AY2019

**ATEAM Ventures, South Korea**

**May 2015 – August 2015**

*Strategic Planning staff*

- Planned strategies for marketing & sales and held a 3D-printer exhibition at KINTEX, Ilsan
- Installed a factory to assemble 3D-printers and managed mechanical components
- Managed all customer inquiries, wrote customer manuals, and sent thank-you letters to early customer

**XbarX (X\_X), South Korea**

**May 2014 – February 2015**

*Sales Director & Co-founder*

- Launched a beer recommendation app and beer-distribution platform
- Got partnership with 218 beer pub, bar, and restaurant in Seoul, South Korea
- Got a shared 3rd award with a \$4,500 cash prize in 'The 3rd Chung Ju-young Start-up Competition' and funding, \$140,000 from a start-up accelerator

**PUBLICATIONS**

**(Submitted) Chung, J.,** Jacoby-Cooper, G., Rook, K., Kendall, E., McGuinness, D., Henrique, O., and Shelden, D. (2023) "Towards an Indoor Environmental Quality Management Ontology" *SWoCoT 2023: Workshop on Semantic Web of Constrained Things*

**(Submitted) Chung, J.,** Tsamis, A., and Shelden, D. (2023) "A framework for monitoring and identifying indoor air pollutants based on BIM with IoT sensors" *Proceedings of Computer-Aided Architectural Design. Interconnections: Co-computing beyond boundaries: 20th International Conference, CAAD Futures 2023*

Lee, G., **Chung, J.,** and Kim, J. (2021) "On What Basis Should We Buy a 3D Concrete Printer?" *Building Construction*, 21(4), 31-34.

**Chung, J.,** Lee, G., and Kim, J. (2021) "Framework for Technical Specifications of 3D Concrete Printers" *Automation in Construction*, 127, 103732, <https://doi.org/10.1016/j.autcon.2021.103732>

**(Submitted) Woo, J., Chung, J.,** and Koo, H. (2021) "A Study on the Pedestrian Route Choices and Accessibility in the Retail Areas after Acute COVID-19: Focused on the Peak Commercial Activity's Hours in the Mangwon District" *Journal of the Urban Design Institute of Korea*

**Chung, J.,** Lee, G., Kim, J. and Choi, J. (2020) "A Comparative Analysis of the Classification System for Three-Dimensional Concrete Printers" *Korean Journal of Construction Engineering and Management*, 21(2), 3-14, <https://doi.org/10.6106/KJCEM.2020.21.2.003>

**Chung, J.,** Lee, G., and Kim, J. (2020) “A Systematic Review of the Geographic and Chronological Distributions of 3D Concrete Printers from 1997 to 2020”, *Proceedings of the 37th International Symposium on Automation and Robotics in Construction (ISARC)*, pp. 84-19, Kitakyushu, Japan, 27-28 Oct., <https://doi.org/10.22260/ISARC2020/0014>

Lee, G., Cho, J., Song, T., Roh, H., Jung, J., **Chung, J.**, Yong, G., and Jeong, D. (2020) “Construction Field Management Using a Popular Text Messenger” *Proceedings of the 18th International Conference on Computing in Civil and Building Engineering*, pp. 971-979, [https://doi.org/10.1007/978-3-030-51295-8\\_67](https://doi.org/10.1007/978-3-030-51295-8_67)

**Chung, J.,** Lee, G., and Kim, J. (2018), “Performance Evaluation Criteria for Building 3D Printing Focused on Concrete Properties”, *Proceedings of the 2018 Annual Conference of the Korea Institute of Construction Engineering and Management*, pp. 27-29, South Korea, 9 Nov.

#### PATANT

Kim, J., Lee, G., Lee, D., Lee, J., **Chung, J.** (2020), “3D printer for construction with continuous printing on the go and 3D printing system comprising it”, Application Serial No. KR20200101482A, South Korea, <https://patents.google.com/patent/KR20200101482A/ko>

#### HONORS & AWARDS

**Research Assistantship Award** for 2021-2023 academic year **August 2021**  
*Rensselaer Polytechnic Institute, New York*

**The 17th Outstanding Thesis Competition**, Honorable Mention **April 2021**  
*Architectural Institute of Korea, South Korea*

**2019 Yonsei Startup Lab Contest (\$2,700)**, Best Startup Award **July 2019**  
*Yonsei University, South Korea*

**2018 KICEM Annual Conference**, Excellent Paper Award **November 2018**  
*Korea Institute of Construction Engineering and Management, South Korea*

**Academic Sholarship** for four semesters **March 2016 – September 2018**  
*Yonsei University, South Korea*

**The 12<sup>th</sup> Architectural Engineering Competition (\$900)**, Excellent Award **September 2016**  
*The Korean Structural Engineers Association, South Korea*

**Volunteer Full-Scholarship** for two semesters **March & September 2016**  
*Dongbu Foundation, South Korea*

**The 3<sup>rd</sup> Chung Juyung Startup Competition (\$4,500)**, Excellent Startup Award **August 2014**  
*The Asan Nanum Foundation, South Korea*

**The 18<sup>th</sup> National Boxing Competition for Non-Athlete**, The 1<sup>st</sup> Prize **August 2012**  
*Korea Boxing Institution, South Korea*

#### PRESENTATIONS & WORKSHOPS

**Build an IoT monitoring system for your smart home** **February 4, 2023**  
*Black Families Technology Awareness Day 2023, RPI [Workshop]*

**Air Quality Monitoring System based on BIM & IoT** **November 2, 2022**  
*EBESS Industry Workshop ‘Well-being & Sustainability in the Built Environment’, RPI [Poster]*

**Air Quality Monitoring System based on BIM & IoT** **May 13, 2022**  
*2022 Three Minute Thesis, RPI [Oral]*

**Air Quality Monitoring System based on BIM & IoT** **May 13, 2022**  
*2022 7<sup>th</sup> Annual Graduate Research Symposium, RPI [Poster, Oral – 3<sup>rd</sup> Place]*

**Build an IoT monitoring system for your smart home** **February 12, 2022**  
*Virtual Black Families Technology Awareness Day 2022, RPI [Workshop]*

<b>A Systematic Review of 3D Concrete Printers from 1997 to 2020</b>	<b>October 28, 2022</b>
<i>37th International Symposium on Automation and Robotics in Construction (ISARC) [Oral]</i>	
<b>Performance Evaluation Criteria for Building 3D Printing</b>	<b>November 30, 2018</b>
<i>2018 Annual Conference of KICEM [Oral]</i>	

CERTIFICATIONS	<b>WELL AP</b>	<b>February 6, 2023</b>
	<i>International WELL Building Institute (IWBI)</i>	
	<b>LEED Green Associate</b>	<b>August 13, 2022</b>
	<i>U.S. Green Building Council</i>	
	<b>2020 AI Technical Development Workshop (Image/Video Recognition)</b>	<b>August 7, 2020</b>
	<i>Korea Electric Power Corporation (KEPCO)</i>	
	<b>The 9<sup>th</sup> Image Recognition Application Workshop</b>	<b>October 19, 2019</b>
	<i>Fast Campus ( 패스트캠퍼스 )</i>	
	<b>The 3<sup>rd</sup> Object Detection Application Workshop</b>	<b>September 7, 2019</b>
	<i>Fast Campus ( 패스트캠퍼스 )</i>	
	<b>DA BIM Specialist Intermediate Workshop</b>	<b>July 14, 2019</b>
	<i>DAGROUP Urban Design &amp; Architecture Co., Ltd</i>	
	<b>2018 BIGDATA X CAMPUS (Python-based Big Data Analysis)</b>	<b>June 14, 2018</b>
	<i>Korea Data Agency</i>	

SKILLS	<p><b>Programming Languages:</b> Python, JAVA, C#, C++, Javascript (Node.js, Three.js, Express.js), P5 Processing, SQL</p> <p><b>CAD/CAE:</b> Rhino(+Grasshopper), Revit(+Dynamo), Sketchup, CATIA, AutoCAD, Midas Civil</p> <p><b>Design tools:</b> Photoshop, Illustration, Indesign, Premiere Pro, Experience Design</p> <p><b>Machining:</b> Arduino, Raspberry Pi, 3D printer, Laser Cutter</p> <p><b>Others:</b> SPSS, Tensorflow(+Keras), Pytorch, Protégé</p>
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LEADERSHIP EXPERIENCES	<b>Project leader, Social Algorithm 7.0 Workshop</b>	<b>August 2020</b>
	<ul style="list-style-type: none"> <li>Led a team project in an international online-workshop organized by Social Algorithm Research Group</li> <li>Analyzed spatial network using Rhino + Grasshopper with Python, and conducted on-site surveys for the validation</li> <li>Based on the analysis result, submitted a journal article to <i>Journal of the Urban Design Institute of Korea</i></li> </ul>	
	<b>Casting Director &amp; Co-founder, We Ask, Korea</b>	<b>January 2013 – September 2014</b>
	<ul style="list-style-type: none"> <li>Co-founded a conference-planning organization called '젊음이 묻습니다', gathering 100+ NGO-interested students</li> <li>Invited 30+ celebrities to have talks with students, such as Im Kwon-taek, Ko Un, Kim Jung-man, and so on</li> <li>Got sponsorships from publishers, theatres, and student councils to implement marketing plans</li> </ul>	
	<b>The 9<sup>th</sup> Chief Representative, Global Intelligence, Korea</b>	<b>January 2012 – July 2013</b>
	<ul style="list-style-type: none"> <li>Directed a volunteer group consisting of 69 college students to organize mentoring programs for teenagers</li> </ul>	

**VOLUNTEER  
EXPERIENCE**

<b>First East Brooklyn High School &amp; Code Nation</b> , New York <i>Programming Tutor</i>	<b>September 2022 – Current</b>
<b>Y-Zone Project</b> in STEM Alliance, New York <i>Bilingual (Korean/English) Volunteer Translator</i>	<b>October 2021 – September 2022</b>
<b>Major Mentoring Program</b> in Yonsei University, Korea <i>Architecture-Major Mentor</i>	<b>March 2019 – May 2021</b>
<b>Architecture School</b> in Junglim Foundation, Korea <i>Architecture Tutor</i>	<b>August 2018 – October 2018</b>
<b>Global Volunteering Program</b> in Dongbu Foundation, Vietnam <i>Student Volunteer</i>	<b>January 2017</b>
<b>Student Volunteer Group</b> in Dongbu Foundation, Korea <i>Volunteer &amp; Scholarship Holder</i>	<b>February 2016 – February 2017</b>
<b>Global Engineering Program</b> in Yonsei University, Indonesia <i>Student Volunteer &amp; Assistant Manager</i>	<b>August 2016</b>
<b>Seoul Junghwa Secondary School</b> , Korea <i>Speech Tutor</i>	<b>September 2012 – December 2012</b>
<b>Seoul Soongduck Primary School</b> , Korea <i>Speech Tutor</i>	<b>March 2012 – July 2013</b>
<b>Kyoto International School</b> , Japan <i>Korean Tutor</i>	<b>August 2012</b>

**REFERENCES**

Available upon request.