

Seungbum Koo, Ph.D.

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Area of Interest

scientific programming, machine learning, numerical analysis, finite element analysis, wave physics

Education

Georgia Institute of Technology

M.S. in Computer Science

Atlanta, GA

01/2018 – current

GPA | 4.00/4.00

The University of Texas at Austin

Ph.D. in Civil, Architectural and Environmental Engineering

Austin, TX

05/2017

Dissertation | Subsurface elastic wave energy focusing based on a time reversal concept

Advisor | Dr. Loukas F. Kallivokas

Program | Mechanics, Uncertainty, and Simulation in Engineering

GPA | 3.90/4.00

University of California, Berkeley

M.S. in Civil and Environmental Engineering

Berkeley, CA

05/2010

Program | Structural Engineering, Mechanics and Materials

GPA | 3.80/4.00

Seoul National University

B.S. in Civil, Urban and Geosystem Engineering

Seoul, South Korea

02/2009

GPA | 3.72/4.30

Research Experience

- Machine learning: structural material behavior estimation
- Finite element analysis: acoustic and elastic wave propagation simulation
- Augmented reality equipped mobile application development
- Absorbing boundary condition: perfectly matched layers (PMLs)
- Time-reversal method: wave energy focusing for enhanced oil recovery
- Spatio-temporal event localization: wave-causing events identification

Publication

Journal Papers

8. Goh, H., **Koo, S.**, and Kallivokas, L.F., 2019. Resolution control in time-reversal (TR) wave-focusing with a switching TR mirror. *The Journal of Acoustic Society of America (JASA)*, 145(4), pp.??-?? [[doi](#)]
7. **Koo, S.**, Kim, J., Kim, C., Kim, J., and Cha, H.S., 2019. Development of An Augmented Reality Tour Guide for A Cultural Heritage Site. *Journal on Computing and Cultural Heritage (JOCCH)*, 12(2), pp.??-?? [[doi](#)]
6. **Koo, S.**, Karve, P.M. and Kallivokas, L.F., 2016. A comparison of time-reversal and inverse-source methods for the optimal delivery of wave energy to subsurface targets. *Wave Motion*, 67, pp.121-140. [[doi](#)]

Conference Papers

5. **Koo, S.**, Kim, C., Sim, J., Lee, D., and Kim, J., 2018, Automatic Quantitative Evaluation System for Apartment Complex Remodeling, in *12th International Symposium on Architectural Interchanges in Asia*, Pyeongchang, South Korea, pp.1954-1958. ([link](#))
4. **Koo, S.**, Park, M., Shin, H., and Kim, J., 2018, Heating Budget Based Automated Thermostat System, in *12th International Symposium on Architectural Interchanges in Asia*, Pyeongchang, South Korea, pp.1959-1963. ([link](#))

3. **Koo, S.** and Kallivokas, L.F., 2017, Wave energy delivery to multiple subsurface targets using time reversal method, in *13th International Conference on Mathematical and Numerical Aspects of Wave Propagation*, Twin Cities, MN, USA, pp.205-206. ([link](#))
2. Goh, H., **Koo, S.**, and Kallivokas, L.F., 2017, Resolution Control in Half-space Time-reversal Wave Focusing, in *13th International Conference on Mathematical and Numerical Aspects of Wave Propagation*, Twin Cities, MN, USA, pp.161-162. ([link](#))

Abstract Proceedings

1. **Koo, S.**, Karve, P.M., and Kallivokas, L.F., 2016, Wave energy focusing to target subterranean formations: a comparison between a time reversal and an inverse-source approach, in *12th World Congress of Computational Mechanics*, Seoul, South Korea, pp.2270. ([link](#))

Grant, Award, Certificate, and Honor

Research Grant

- National Research Foundation of Korea 06/2018 – 05/2021
 Title | Development of a sensor system using the Internet of Things (IoT)
 to detect visitor's traffic line and anomaly behavior in a multi-purpose facilities
 Assign. No. | 2018R1A6A3A11049901

Awards

- Professional Development Award, The Graduate School, The University of Texas at Austin 05/2017
- Travel Award, United States Association for Computational Mechanics 03/2016

Scholarships

- Superior Academic Performance, Seoul National University
 Semesters | Fall 2008, Spring 2008, Spring 2007, Fall 2003
- National Scholarship For Science and Engineering, Korea Scholarship Foundation
 Semesters | Fall 2007, Spring 2004

Honor

- Graduated with Honors (cum laude) 02/2009
 Seoul National University

Certificates

- Engineer-in-Training (EIT), No. 57019 11/2016
 Texas Board of Professional Engineers
- Certified Teaching Assistant 05/2015
 Cockrell School of Engineering, The University of Texas at Austin
- Fundamentals of Engineering – Civil (FE Civil) 04/2011
 National Council of Examiners for Engineering and Surveying (NCEES)

Patent and Copyright

Patent

3. Automatic Floor Plan Recognition Technology Based Structural Safety Evaluation Program (pending)
 on Bearing Wall Extension and Demolition

Copyrights

2. Automatic Remodeled Floor Plan Safety Grader on the Bearing Wall Removal 10/2018
 Reg. No. C-2018-026350
1. Augmented Reality Tour Guide Program for Cultural Heritage 09/2018
 Reg. No. C-2018-025798

Presentations

Invited Talks

3. "Time Reversal Concept for Wave Energy Focusing", *Texas Consortium for Computational Seismology 11th biannual Research meeting*, Houston, TX (04/2016)
2. "Seismic wave refocusing using time reversal method in half space", *Seminar Series in Korean American Scientists and Engineers Association*, Austin, TX (11/2014)

Poster Presentation

1. "Wave energy focusing to multiple subterranean targets using time reversal idea", *The University of Texas at Austin Graduate And Industry Networking*, Austin, TX (01/2017)

Work Experience

Lecturer at <i>The University of Texas at Austin</i> , Austin, TX Taught calculus, differential equations, linear algebra, structural analysis, and reinforced concrete.	01/2015 – 01/2018
Research Assistant at <i>The University of Texas at Austin</i> , Austin, TX Developed software for the simulation of seismic wave propagation in earth.	08/2011 – 05/2017
Intern at <i>Samsung Construction and Trading</i> , Oido, South Korea Railway construction design modification	12/2008 – 02/2009