

LSGI Distinguished Lecture Series

“3D Mapping and Spatial Data Science for “Smart and Connected” Future World”

Overview

It was our pleasure to invite Prof. Joon Heo, Professor of Civil and Environmental Engineering & Director of Open Smart Education Center, Yonsei University, Korea, to deliver a seminar of the LSGI Distinguished Lecture Series on 30 April 2018.



Biographies

Joon Heo is a professor at the department of civil and environmental engineering, and the director of Open and Smart Education (OSE) Center, which was formed in 2014 and in charge of MOOC production, Yonsei Learning Management System (YSCEC), and other educational issues. He also served as an associate director of Yonsei Enterprise Support (YES) Foundation from 2009 to 2017, which is in charge of incubating and accelerating start-ups at Yonsei University.

He obtained his B.S. in the Department of Civil Engineering (Urban Engineering Major) from the Seoul National University in 1993, and his M.S. and Ph.D. in Civil and Environmental Engineering from University of Wisconsin-Madison in 1997 and 2001 respectively. In 2000, he joined a start-up company, Forest One Inc., a value-added geospatial information provider and IT consulting company, located in Evanston, IL. For the following five years, he led technology developments as CTO and provided technical services to Fortune 500 companies. He joined the Department of Civil and Environmental Engineering at Yonsei University in 2005 as a faculty member and has taught Geographic Information System (GIS), photogrammetry, and remote sensing. His areas of research interests include (1) spatial data production and analytics with specific domain expertise of infrastructure operation and management; (2) spatial data science with applications of transportation, health, business, military, and education; (3) image processing and remote sensing for natural resource management and construction. He has published over 100 refereed journal papers and over 150 conference papers.

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The future world under the name of “4th Industrial Revolution” or “Digital Transformation” can be characterized by the keywords, ‘Data’, ‘Smart’, and ‘Connected’, where ‘Spatial’ (Map) is the core infrastructure and the realization of the key words. The argument would be justified by business transactions by major IT companies such as Apple, Google, Microsoft, Amazon, Intel, and Nokia.

The first part of this presentation will introduce such industry trends around ‘Map’ and try to answer why spatial is so important in the future smart and connected world. The second part, a summary of research works at Spatial Computing for Sustainable Infrastructure (SCSI) Lab, at Yonsei University, is composed of two parts – 3D mapping science and spatial data science. The one will focus on 3D indoor mapping using lidar, of which contents will cover sensor calibration, sensor integration, SLAM machine, point cloud data management, 3D geometric and topological modeling, and on-going development of Hadoop-based large point cloud processing solution. The other will discuss a framework of spatial data science and a variety of related applications using spatial (big) data such as smart infrastructure and smart city applications, education, politics, public health using taxi trajectory, floating population, Digital Tachgraph (DTG), etc., and conventional remote sensing applications from data science perspectives as well. Particularly, it will substantiate the potential of spatial (big) data for pursuing correlational relationships, instead of causal relationship of traditional science.