

Kim, Seongyong

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EDUCATION

- Master of Engineering in Civil and Environmental Engineering** Mar. 2017 – Feb. 2019
Seoul National University (SNU), Graduate School, Seoul, Republic of Korea
LeeJaeWoon Scholarship Foundation with two semesters & Brain Korea 21 Plus scholarship
- Bachelor of Engineering in Architectural Engineering** Mar. 2010 – Feb. 2017
Seoul National University (SNU), Seoul, Republic of Korea (Alternative military service at firehouse: 2013 –15)
The Excellence Award in the Graduation Exhibition
Moon-Joo Scholarship Foundation with two semesters of high honors
- Busan Science High School (BSHS)** Mar. 2008 – Feb. 2010
Busan, Republic of Korea
High school for scientifically gifted students

RESEARCH INTERESTS

Indoor Spatial Information | Floor Plan Analysis, IndoorGML, Computer Vision (Deep Learning)
Geographic Information System | Remote Sensing Image (Satellite, UAV), Object Detection, Spatial Analysis

EXPERIENCE

- Institute of Construction and Environmental Engineering (ICEE)** Seoul, Republic of Korea
Research Fellow Mar. 2019 – Present
- Committed to various projects based on capabilities of dealing with GIS tools and utilizing deep-learning networks
- Seoul National University Spatial Informatics Group** Seoul, Republic of Korea
Full-time Student Researcher Mar. 2017 – Feb. 2019
- Experienced broad research fields in GIS/LBS laboratory and performed various research projects upon request of the government departments
 - Supported research activities on constructing indoor information and analyzing spatial data onto maps
 - Primarily took a role of developing and analyzing algorithms when collaborating with lab colleague, and particularly interested in image processing based on Deep Learning

GRADUATE THESIS

Increasing Generality of Floor Plan Analysis Process Using Style Transfer. (2019)

PROJECTS

Classify into three categories according to the area of interest, and summarize my contribution

1) Indoor Spatial Information, 2) Geographic Information System, 3) Policy Analysis

1. Indoor Spatial Information

Development of Core Technology for Building and Updating Indoor Information Considering Cost Efficiency

Funded for five years by Ministry of Land, Infrastructure and Transport (MOLIT) Jul. 2017 – Present

- Our group has been in charge of utilizing scanned floor plans while the goal of the whole project is to build indoor information in IndoorGML using various materials and to utilize that information
- Primary concern, by developing cost-effective technology based on floor plans, is to build and update indoor information through user participation in places such as Open Street Maps
- Developed a vectorising module that is robustly applicable to complicated and various formats of floor plans; addressed the conversion of complicated formats through Generative Adversarial Networks in Deep Learning

PROJECTS, CONTINUED

2. Geographic Information System

Empirical Model for Next-Generation Land Information Combining Multi-Sensor and GeoAI Technology

Funded by Land and Geospatial InformatiX Corporation of Korea (LX) Jan. 2019 – Dec. 2019

- Designed a model that updates the land usage in cadastral maps using hyperspectral drones in Jeonju-city
- Performed segmentation on drone images using CNN-based networks and enabled raster outputs compatible with cadastral maps using spatial analysis tools in ArcGIS

Pilot Project of Hydrographic Survey Using Drone Targeting the Han River and Cheongmi Stream

Funded by Seoul Regional Construction and Management Administration (SROCM) Jun. 2018 – Jul. 2018

- Evaluate the accuracy of the control points of LiDAR and Sonar images by referring to the International Hydrographic Organization's regulations

Object Detection Model on the Remote Sensing Image & Fusion Plan of Geographic Information

Funded by Land and Geospatial InformatiX Corporation of Korea (LX) Jul. 2017 – Oct. 2017

- Proposed a model to detect unauthorized facilities occupying on the national and public land using spatial data
- Through the model builder in ArcGIS, built a module to find parcels containing objects detected through watershed algorithm, even though they are not recorded in the ledger

3. Policy Analysis

Improvement of Address System-based Industrial Strategy Considering the Fourth Industrial Revolution

Funded by Ministry of the Interior and Safety (MOI) Jul. 2017 – Dec. 2017

- Ameliorated the National Point Number, an address system that numbers each grid across the whole country, and developed a strategy applying them to the platforms or industry

SKILLS

Licenses	2015 Registered Engineer Architecture, Korea
Computer skills	MATLAB, Python TensorFlow, PyTorch
GIS tools	ArcGIS, QGIS Orfeo ToolBox, Semi-automatic Classification Plugin, GDAL, ENVI

PUBLICATIONS & PATENT

Working Articles

“Analyzing Complicated Floor Plans Using Style Transfer”, co-authors Seula Park, Hyeonjung Kim, and Kiyun Yu (currently under review at *Automation in Construction*)

Articles

“Indoor network generation using building evacuation maps”, co-authors Seula Park, Kiyun Yu, and Jeong-Ok Kim, *Journal of the Korean Society of Hazard Mitigation*, Vol. 18, No. 7, 2018, 387-394.

“Detection of unauthorized facilities occupying on the national and public land using spatial data”, co-authors Jae-Bin Lee, Hanme Jang, and Yong Huh, *Journal of the Korean Society of Surveying, Geodesy, Photogrammetry and Cartography*, Vol. 36, No. 2, 2018, 67-74.

International Conference Presentations

“Application of Style Transfer in the Vectorization Process of Floorplans (Short Paper)”, co-authors Seula Park, and Kiyun Yu, *10th International Conference on Geographic Information Science (GIScience 2018). Schloss Dagstuhl-Leibniz-Zentrum fuer Informatik*, Melbourne, Australia, 2018.

“Proposal for a Method of Extracting Road Layers from Sensing Image Using Conditional GANs”, co-authors Seula Park, and Kiyun Yu, *Proceedings of the 2nd International Conference on Digital Signal Processing. ACM*, Tokyo, Japan, 2018.

Patent

- Kiyun Yu, **Seongyong Kim**, Janghuk Im, and Jiyeong Kim, Method for Location Identification Using Volunteered Geographic Information, Korea Patent No.10-2953235, issued Dec. 2019

RELATED ACTIVITIES

Participated in the Startup Company as a GIS engineer

Jan. 2018 – Present

- Participated in the startup whose goal is building a platform of customized house recommendation system
- As a first step, designed a system that automatically gathers apartment and relevant POI information from government and major portal site
- Currently, working on the patent for the house recommendation system that includes distance-based index for each POI and learning-based model based on implicit feedback

The Idea Competition for Personal Theme Maps Hosted by National Geographic Information Institute (NGII)

- Received the grand prize (awarded by the Minister of Land, Infrastructure, Transport, Jan. 2018)
- Designed the Safety Maps for Women by indexing and quantifying hazard levels using viewshed of surveillance cameras, distribution of street lamps, etc.

ADDITIONAL EXPERIENCE

Alternative military service at firehouse:

- Contributed to the community as an ambulance staff (Oct. 2013-Oct. 2015); received the prize of ‘Heart Saver’ for saving a person from a heart attack (awarded by Busan Metropolitan City Fire Disaster Headquarters on Jul. 30, 2014)

Outreach activities:

- As volunteer corps of Institute for Global Social Responsibility (IGSR), participated in the March Village Resettlement (the Global Village program from *Habitat for Humanity*) on Bantayan Island in Cebu, the Philippine (Jan. 11-21, 2017); constructed Typhoon-resistant concrete houses and provided education for local schoolchildren
- Received the Silver Award from Korean Red Cross by donating blood more than 30 times
- Lent homeless people a helping hand by being a volunteer participant of The Big Issue; took care of children at daycare centers for foreign and multicultural kids