

Koichi Ito

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RESEARCH INTERESTS

A spatial data analyst equipped with research experiences as a master's student in urban planning at the National University of Singapore and consultant at the World Bank Group by leveraging programming skills, interested in researching human mobility with emerging spatial data sources, such as street-view imagery, and machine/deep learning techniques.

EDUCATION

The National University of Singapore Singapore
May 2021

- Master of Urban Planning
- Thesis supervised by Dr. Filip Biljecki: Assessing bikeability with street view imagery and computer vision
- 4.53/5.00 cumulative GPA (Highest Distinction)

Soka University of America Aliso Viejo, CA
May 2019

- Bachelor of Arts, Liberal Arts with Concentration in Environmental Studies
- Thesis supervised by Dr. Deike Peters: Assessment of a GEF-funded Sustainable Transport Project in Jakarta, Indonesia
- 3.95 /4.00 cumulative GPA (summa cum laude)

Council on International Educational Exchange Dakar, Senegal
Aug 2017 – Dec 2017

- Study abroad program

Honors

- Japan Student Services Organization Scholarship (US\$40,000) Aug 2020 – May 2021
- Soka University of America Makiguchi Scholarship (US\$10,000) May 2019
- Soka University of America Dean's List (GPA is 3.7 or higher) Dec 2015 – May 2019
- Soka University of America Merit Scholarship (US\$20,000) Aug 2015 – May 2019

PUBLICATIONS

Ito, K., & Biljecki, F. (2021). Assessing bikeability with street view imagery and computer vision. *Transportation Research Part C: Emerging Technologies*, 132, 103371. <https://doi.org/10.1016/j.trc.2021.103371>

Biljecki, F., & **Ito, K.** (2021). Street view imagery in urban analytics and GIS: A review. *Landscape and Urban Planning*, 215, 104217. <https://doi.org/10.1016/j.landurbplan.2021.104217>

ACADEMIC JOURNAL PEER REVIEW

International Journal of Applied Earth Observation and Geoinformation May 2022
Landscape and Urban Planning Jan 2022
Environment and Planning B: Urban Analytics and City Science Sep 2021

INVITED TALKS

"Application of GIS in Research and International Institution." Soka University of America, Advanced GIS Course. Online. Oct 2021

RESEARCH EXPERIENCE

The World Bank Group Washington, D.C.
Consultant with Dr. Takaaki Masaki Apr 2021 – Present

- Examine the impacts of conflicts on socio-economic indicators in African countries
- Compute zonal statistics of conflict data, nighttime light data, road network, food price, and educational facilities between 2010 and 2020 in R
- Contribute to the development of R Shiny dashboard apps by debugging and preparing datasets

The National University of Singapore Singapore
Graduate Researcher with Dr. Filip Biljecki Spring 2021

- Developed a workflow using street view imagery and computer vision to assess bikeability in Singapore and Tokyo
- Constructed a composite bikeability index with 34 indicators in Python, of which 21 indicators were extracted from more than 57,000 street view images by using a DeepLab3 model trained on Mapillary Vistas dataset for semantic segmentation, a YOLOv3 model trained on Pascal VOC dataset for object detection, and a ResNet50 model trained on Places365 dataset for image classification
- Extracted the remaining indicators from open data, such as OpenStreetMap, by using OSMnx in Python
- Prepared the documentation and secured ethical approval for this research (IRB)
- Designed and executed a large-scale survey using Amazon Mechanical Turk to assess perceptions and build a predictive LightGBM model based on extracted visual features on Amazon SageMaker

The National University of Singapore
Research Assistant with Dr. Filip Biljecki

Singapore
Fall 2020

- Conducted a systematic review on street view imagery in urban analytics and GIS studies between 2018 and 2020, screening 619 studies and reviewing 250 studies to classify into 10 application domains
- Visualized quantitative findings, such as share of data sources, data sizes, and share of open access publication, open-source code, and open data, in R
- Gained a comprehensive understanding of the state of the art of computer vision in GIS and urban analytics

The National University of Singapore
Course Project with Dr. Wen-Chi Liao

Singapore
Spring 2020

- Studied the impacts of the built environment on the cycling behaviors in New York City by using Citi Bike usage data between 2014 and 2018
- Built a linear regression model with built environmental characteristics, such as land use and infrastructure, and socio-economic characteristics as independent variables and bike usage count in census tracts as a dependent variable in R
- Found that built environmental characteristics, such as bike lanes and street trees, have positive and significant correlations with bike usage count

The National University of Singapore
Course Project with Dr. Sandeep Narayan Kundu

Singapore
Spring 2020

- Examined the correlation between wildfires and other spatial data, such as topography, land use, and vegetation, in Northern Territory in Australia from 2011 to 2016
- Built a zero-inflated negative binomial model in R to overcome the overdispersion and zero-inflation in the data
- Identified specific types of vegetations to be more susceptible to wildfires

WORK EXPERIENCE

The World Bank Group
Consultant

Washington, D.C.
Apr 2021 – Present

- Conduct spatial analysis in R to write a report on conflicts and socio-economic indicators in the Central African Republic
- Collect and wrangle more than 15 indicators for an internal R shiny app to identify the target population in Mozambique

Johnson Controls
Data Analytics Intern

Singapore
Nov 2020 – May 2021

- Built a data pipeline of PM2.5 data, weather data, and traffic data in Singapore on Azure Synapse with a real-time dashboard on Power BI
- Programed a real-time time-series model with LightGBM in Python on Azure Synapse

The World Bank Group
Urban Development Research Intern

Tokyo, Japan
Apr 2020 – Jan 2021

- Wrangled a comprehensive data set of more than 4,000 Tokyo-based startups' numerous information, such as addresses, investors, and accelerators in Python (The report is available here: <https://openknowledge.worldbank.org/handle/10986/36462>)
- Visualized financial performance of light rail transport system in Toyama prefecture between 2002 and 2019 (The report is available here: <https://openknowledge.worldbank.org/handle/10986/35180>)

ENDA LEAD Afrique Francophone
Research Intern

Dakar, Senegal
Aug 2017 – Dec 2017

- Wrote a report on accessibility to potable water in 500 villages in the Saint-Louis region in Senegal

LANGUAGES AND SKILLS

- Language Skills: Japanese (native), English (fluent), French (limited working proficiency)
- Computer Skills: Python (GluonCV, PyTorch), R, SQL, Spark, ArcGIS, QGIS, Google Earth Engine, Azure, AWS, Power BI

REFERENCES

Filip Biljecki Presidential Young Professor School of Design and Environment The National University of Singapore 4 Architecture Dr Singapore 117566 filip@nus.edu.sg	Sandeep Narayan Kundu Marine Geospatial Scientist Fugro Singapore Marine Pte Ltd 158 Mariam Way, #08-04 Ballota Park Singapore – 507083 snkundu@gmail.com	Victor Mulas Director at Tokyo Development Learning Center World Bank Group 2-2-2 Uchisaiwai, Chiyoda, Tokyo 100-0011, Japan vmulas@worldbank.org	Takaaki Masaki Economist The World Bank (Poverty & Equity Global Practice) 1818 H Street, NW Washington, DC 20433 USA tmasaki@worldbank.org
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