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Abstracts

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Crime prediction using administrative big data and machine learning

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It is indisputable that machine learning techniques and big data analysis have become the main topics in almost all discipline of science and industry during the past decade. Concurrently, numerous governments in the world are collecting enough amounts of administrative data that can be analyzed by machine learning techniques to investigate the causes of social phenomena and to improve the efficiency of public administration. Despite the data analytic techniques and the capability of data storage have been remarkably improved, a large number of scholars in the field of social science hold conservative perspective on applying machine learning and big data analysis to explaining social phenomena. The goal of this study is to fill the void by providing empirical evidence. The present study will attempt to examine the validity of using administrative big data to predict crime incidents. Records of calls for service through 311 mayor's hotline system in Houston, Texas and the official crime reports of Houston Police Department were examined to assess whether signs of physical decay and the presence of social nuisance predict the crime incidents at neighborhood level. The results of this study will corroborate the Broken Windows Theory and present new windows to explore the causes of crime. Several policy implications for government and police administrators will be developed and discussed.

Recent Publications

1. Oh G and Connolly E J (2019) Anger as a mediator between peer victimization and deviant behavior in South Korea: A cross-cultural application of general strain theory. Crime and Delinquency DOI: 10.1177/0011128718806699.

2. Kim J, Oh G and Siennick E (2018) Unraveling the effect of cell phone reliance on adolescent self-control. Children and Youth Services Review 87:78-85.

3. Ha T, Oh G and Park H H (2015) Comparative analysis of defensible space in CPTED housing and non-CPTED housing. International Journal of Law, Crime, and Justice, 43(4):496-511.

4. Park H H, Oh G and Paek S Y (2012) Measuring the crime displacement and diffusion of benefit effects of open-street CCTV in South Korea. International Journal of Law, Crime, and Justice, 40(3):179-191.

Biography

Gyeongseok Oh is pursuing his PhD at SHSU Criminal Justice. He has completed his MS in Criminology and Criminal Justice at Florida State University in 2016 and MA in Criminal Justice at Yong In University. Before pursuing his graduate studies, he worked as a Detective in the Korean Police Agency for six years after obtaining his Bachelor's degree at Korean National Police University. He is currently working on the research project entitled, "Social media analysis of neighborhood sentiment and its impact on crime patterns" with Dr. Yan Zhang. His primary research interests include crime analysis using Big Data and machine learning, policing, and biosocial criminology.

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Application of the RNN in the fundamental physics with KamLAND experiment

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The development of the machine learning in recent years has begun to benefit the fundamental physics research. In the neutrino detector KamLAND aiming to unravel the mysteries of the universe, discriminating gamma-ray that inhibits the signal has been ultimate task. This research made it possible by using recurrent neural networks (RNN).

Recent Publications

1. A. Gando et al. "Search for Majorana Neutrinos Near the Inverted Mass Hierarchy Region with KamLAND-Zen", Physical Review Letters 117, p.082503 (2016)

2. A. Gando et al. "A Search for electron antineutrinos associated with gravitational wave events GW150914 and GW151226 using KamLAND", The Astrophysical Journal Letters, Volume 829, Number 2 (2016)

3. A. Gando et al. "Search for double-beta decay of 136Xe to excited states of 136Ba with the KamLAND-Zen experiment", Nuclear Physics A, Volume 946 p.171-181 (2016).

Biography

Shingo Hayashida is a research fellow of the Japan Society for the Promotion of Science (JSPS). He is expected to take PhD from Tohoku University in Japan in March 2019. He has published 6 papers in reputed journals.

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