

## Data Science for Social Impact

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Big data-driven science is bringing innovations to many research fields that have a direct social impact. In this talk, I'd like to share recent efforts on research related to Sustainable Development Goals (SDGs). One of them is the inference of socio-economic activities based on satellite imagery such as the well-being status and poverty mapping. Recent advances in computer vision algorithms and the availability of high-resolution satellite images for remote sensing help us tackle these problems from a new perspective. In particular, this talk will feature our group's recent findings on the correlations of happiness and urban green space, measured systematically from satellite imagery. We will show environmental and social welfare like green space become more important than wealth in determining happiness, once society reaches a certain level of GDP (gross domestic product) per capita. In another research, we examine one of the most remote and closed areas in the world, North Korea. The talk will show how a human-machine collaborative algorithm can compute, for the first time, local-level and district-level estimates of economic activity from publicly available satellite imagery. The multi-faceted evaluation based on partial statistics confirms that our method, leveraging no label information, can explain up to 80% of the regional variation. Efforts on reliable and timely measurements of economic activities are fundamental for understanding economic development and designing government policies. Besides these projects, the possibilities to utilize satellite imagery for social impact are endless. I will end the talk by outlining several future directions including climate change and epidemics.

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