

Human-centred analytics for a Smart Nation

MENTION the term Smart Nation and most people will conjure up visions of an urban landscape dotted with sensors—traffic cameras, GPS-equipped vehicles, and so on.

While such infrastructure-centric investments will clearly improve operations in areas such as transportation, power and water, I believe that we must also envision a Smart Society — one that enables individuals to lead healthier, productive lives and that fosters greater community participation.

Such human-centric innovations can often be built by applying emerging technologies, such as machine learning and analytics, to already existing, often human-generated, data streams — what I label as “soft sensors”.

At Singapore Management University (SMU), several such projects are currently underway via the Centre for Applied Smart-Nation Analytics, recently established under the Government’s Translational R&D for Application to Smart Nation funding initiative.

In one such effort, we are collaborating with the Health Promotion Board (HPB) to explore the use of machine learning to foster healthier lifestyles through improved food intake monitoring.

Researchers at SMU’s Living Analytics Research Centre (Larc), led by Associate Professor Steven Hoi, have built food image recognition technology, powered by state-of-the-art deep learning techniques, and applied it to a database of nearly 1,000 popular Singapore food items.

Presently, HPB’s Healthy 365 app allows users to track not only calories burnt (via the National Steps Challenge) but also monitor calorie intake via a diet journal.

In support of HPB’s mobile food

applications for smart food logging, SMU is building such advanced automated food recognition capabilities, providing users a smarter way to update their diet journal.

Such human-centric sensing also underpins the collaboration between SMU and the Municipal Services Office (MSO).

MSO operates the popular One-Service platform (including a mobile app), which residents can use to report specific municipal issues, such as overflowing garbage or faulty street lights.

I am coordinating a joint pilot project that investigates the feasibility of engaging residents via mobile crowdsourcing technologies to voluntarily perform a variety of location-specific municipal tasks.

Over the past three years, Larc researchers, in partnership with investigators from Conduent Labs India, have developed novel techniques for coordinated mobile crowdsourcing, which recommend tasks to individual users such that they align better with their predicted routine commuting paths.

At SMU, we have successfully used these technologies to deploy Ta\$ker, a mobile crowdsourcing app used daily by hundreds of students to provide reports (such as queue lengths at foodcourts) for a smart campus monitoring service.

We are now developing applications to pilot such crowdsourcing concepts nationwide.

These projects provide early examples of a new wave of innovation for a smart society, which harnesses the power of analytics on user-generated data and the voluntary participation of a wider swathe of city residents.

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