Data-Driven Urban Systems Modeling towards a Smart City

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In this talk, we share some of the initiatives of the Institute of High Performance Computing, A*STAR to develop complex systems and machine learning models to reconstruct certain city dynamics particularly involving Singapore's land-use and transportation systems. The talk is broken down into three parts. Two of the three are on the Singapore transport system, and the final part is on our work on land-use policy. For the transport part, we discuss our efforts in (1) developing a full-scale model agent-based model of the Singapore rapid transit system, and (2) in building a framework to help enhance bus commuter experience. For the land-use, we present our latest paper quantifying the complex relationship between land-use and transport, by using geo-features at two differing levels of granularity (the more general land-use sector types and the more granular amenity structures) to evaluate their impact on public transit ridership in both time and space. The recurring theme in all three parts is: developing data-driven computational models that can serve as decision-support tools to assist urban and transport planners in strategizing and planning for a smart city.

References

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