LEE KUAN YEW CENTRE FOR INNOVATIVE CITIES
PRESENTS

BROWNBAG LUNCHTIME TALK

Geospatial Knowledge Graph for Urban Studies

DATE AND TIME	DR JINGYA YAN	VENUE
21 November 2024, 1 - 2 pm	Adjunct Lecturer, Master of Science in Urban Science, Policy and Planning (MUSPP) Programme	Think Tank 22 Building 2, Level 3 (2.311)

SYNOPSIS - Cities are evolving into increasingly differentiated, complex, and diverse systems. Fundamental drivers of urban forms, such as energy, mobility, and information technology, have transformed radically within the past decade. These shifts have given rise to new lifestyles, alongside changing demographic and migration patterns, prompting a need for new social structures and a rethinking of spatial organization. The 'smart city' narrative, along with much of the enthusiasm surrounding artificial intelligence (AI) and optimization, often oversimplifies cities and their citizens, reducing them to mechanical components within a controllable urban system. While there is a growing demand to measure, monitor, and manage the complexity of urban environments, a new conceptual framework is required for digital urban representation. Semantic Web Technologies, initially developed for the World Wide Web, offer a way to represent 'the world' or subsets through relationships or graphs. These technologies utilize semantic data and ontologies, which are common vocabularies that define different urban domains. This approach enables the integration of knowledge and reasoning through descriptive logic, helping to overcome challenges in representing large, complex systems like cities. Specifically, it addresses data fragmentation through linked data (e.g., planning, transport, energy, and other domains) and facilitates interoperability between these domains by using ontologies to harmonize data formats.

DR JINGYA YAN received her Ph.D in Geomatics from The French Naval Academy Research Institute (IRENav), and she has a background in computer science. Her research focuses on knowledge graphs and ontology for the geospatial data model, which works on 3D city modelling and city information management. She worked on the Digital Underground project in the Singapore-ETH centre, which aims to develop 3D mapping of underground utilities. She works on the World Avatar project in CARES, Cambridge, which aims to create a digital 'avatar' of the real world by dynamic knowledge graphs. It integrates 3D city models with simulation models to support urban studies, such as City Energy Analyst and sea level rise risk analysis.

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