

SOLAR CITIES FOR ENERGY TRANSITION FACILITATED BY GEOGRAPHICAL INFORMATION SCIENCE WITH MULTI-SOURCED SPATIOTEMPORAL BIG DATA

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12-1 PM SGT | Seminar Room

Abstract

Promoting renewable energy sources to reduce dependency on conventional fossil fuels is an effective way to achieve the United Nations' Sustainable Development Goals on carbon neutrality. In this context, solar farming has been experiencing explosive development in recent years. Compared with the utility-scale solar photovoltaic (PV) plants located at remote and bare lands with stable meteorological conditions, effectively harvesting solar energy in urban areas is challenging because: (i) solar distribution is significantly affected by a complex 3D built environment, (ii) proper PV installed capacity is uncertain with the solar distribution that is quantitatively large (for generating a large amount of electricity) and spatially concentrated (for easy installation and maintenance), and (iii) the uncertainty of the economic performance of the PV system when comparing the income and expenditure during the whole life cycle. In this talk, I will present the concept of a sustainable solar city with the development of six interactive modules to effectively penetrate solar energy into various urban systems. The concept will be implemented through estimating land surface solar irradiation, constructing 3D urban surfaces, modelling spatiotemporal solar potential distribution, planning solar PV systems, designing solar PV charging solutions, and revealing the socio-economic and environmental impacts of solar energy.

Speaker bio

Rui Zhu, Scientist, Institute of High Performance Computing (IHPC), Agency for Science, Technology and Research (A*STAR), Singapore

Dr. Zhu was a Research Assistant Professor at The Hong Kong Polytechnic University (PolyU) and Postdoctoral Associate at MIT Senseable City Laboratory. Zhu obtained his PhD degree in GIScience from PolyU (Hong Kong, China) with an exchange study at Université Laval (Canada), MSc from KTH – Royal Institute of Technology (Sweden), and BSc from Nanjing Normal University (China). Zhu has published more than 50 SCI papers related to Solar Energy. Zhu has served as a PI/Co-I for Hong Kong RGC research projects, Board of Director in CPGIS, members in AAG and ISPRS, and (guest) editor for several academic journals

<https://felix-rz.github.io/>

