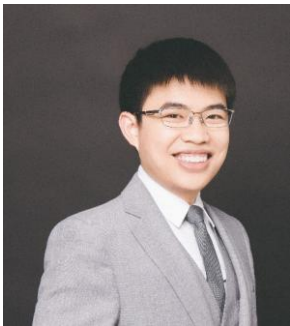


The interplay of cloud cover and 3D urban structures reduces human access to sunlight

15th January 2026 (Thu)
4:30 – 6:00 pm (UTC+8)
Rm 221, Chen Kou Bun
Building, CUHK

Sunlight exposure in urban areas is essential for human health, yet its reduction due to cloud cover and complex 3D urban architecture is often overlooked. Here we introduce a framework that combines natural day length variations, cloud cover and 3D urban structures to assess sunlight duration in cities. Applying this framework to 1,353 US cities, we found a significant decrease of 2,896 h (121 days) in available sunlight for 2020, with cloud cover accounting for 2,448 h (102 days) and urban structures contributing to a 448-h (19-day) loss. With the observed increasing trends in cloud cover and urbanization, sunlight loss is likely to worsen. Our study highlights the pressing need for interdisciplinary urban planning strategies that prioritize adequate access to natural sunlight.



Shengbiao Wu

Research Assistant Professor

**Division of Landscape Architecture, Department of Architecture,
Faculty of Architecture, The University of Hong Kong**

Dr. Shengbiao Wu is a Research Assistant Professor in the Division of Landscape Architecture at the University of Hong Kong (HKU). His research explores human-environment spatiotemporal interactions, focusing on urban greenspace dynamics, surface albedo, sunshine/shade patterns, and infrastructure accessibility. He has authored or co-authored over 70 refereed publications in top journals, including Nature Sustainability, Nature Human Behaviour, Nature Communications, Nature Cities, Remote Sensing of Environment, and ISPRS Journal of Photogrammetry and Remote Sensing. Dr. Wu's contributions have earned international acclaim, including the HKU Research Output Prize, the American Association of Geographers (AAG) Early-Career Award in Remote Sensing, and the Li Xiaowen Remote Sensing Excellent Youth Award.



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