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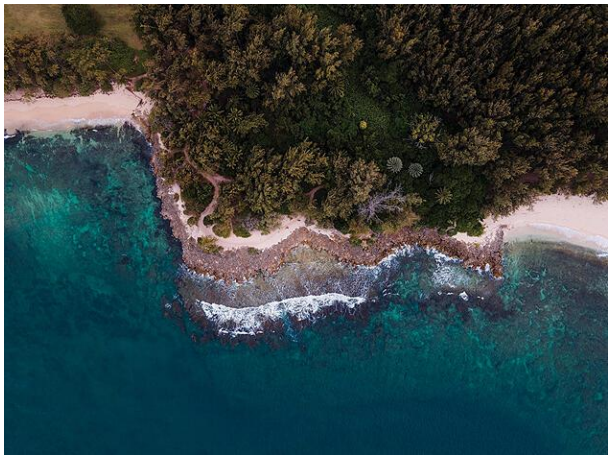
English translation

Strengthening Critical Infrastructure Underground and Offshore to Address Urban Land Scarcity Singapore

Nanyang Technological University (NTU) in Singapore has announced that researchers from its School of Civil and Environmental Engineering (CEE) are working on projects to strengthen critical infrastructure underground and offshore using advanced technologies and innovative materials to address urban challenges.



As the world's population explodes, urban land scarcity must be addressed. CEE researchers are addressing this challenge by researching how to utilize underground space and protect low-lying areas from rising sea levels due to global warming. Supported by the interdisciplinary Centre for Urban Solutions (CUS), projects include reducing the cost of underground construction, developing new digital platforms to improve safety, and developing environmentally friendly building materials to adapt to rising sea levels.

Associate Professor Wu Wei, head of the Underground Engineering Cluster at CUS, is working with a cross-functional team to pioneer digital solutions to manage the unpredictability of the underground. They are developing a method to use artificial intelligence (AI) to accurately map underground structures such as cavities and rocks, and are aiming for autonomous anomaly detection technology using machine learning.

Professor Chu Jian, CEE Chair and CUS Director, is also leading two research projects under the Coastal Protection and Flood Resilience Institute Singapore to improve coastline stability and explore sustainable materials for coastal protection. One of these efforts is biocement, a durable and sustainable cement alternative produced from waste materials that contributes to the circular economy.

Professor Chu said about CEE and CUS research activities supported by strategic collaborations with industry and government: "Most of our research projects are funded by government agencies or industries that address national needs directly. All the work contributes to building up a city’s resilience against the changing climate."

https://spap.jst.go.jp/asean/news/250102/topic_na_01.html