香港科技大學
THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

土木及環境工程學系
DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

SEMINAR

3D PRINTING OF LIMESTONE-CALCINED CLAY-BASED CEMENTITIOUS MATERIALS

Speaker

Dr. Yu CHEN

Southeast University

Abstract

Extrusion-based 3D concrete printing (3DCP) is gaining significant attention from academia and industry due to its advantages in concrete construction. These benefits include enhanced architectural design freedom, elimination of formwork, optimized material usage, and reduced waste, labor, and costs. However, the sustainable advantages of 3DCP can be compromised due to the high content of ordinary Portland cement (PC) in most 3D printable cementitious materials. Efforts have been made to develop sustainable alternatives, such as using common supplementary cementitious materials (SCMs) like fly ash, silica fume, and slag. However, these SCMs, being industrial by-products, are depleting over time. For long-term development, limestone and calcined clay are promising alternatives to SCMs, thanks to their widespread availability and low CO2 footprint in material production. This presentation will provide recent studies on the rheology and interlayer bonding of 3D printed cementitious materials containing limestone and calcined clay

Biography

Dr. Yu CHEN is a professor and a member of Prof. Yamei ZHANG's research group at Southeast University. He obtained his PhD in 2021 at Microlab, TU Delft, under the supervision of Prof. Erik Schlangen. Following that, he continued at Microlab as a postdoc researcher until October 2023. His research focuses on material design and performance enhancement for 3D concrete printing. To date, he has published one English monograph (as first author) and 39 papers in SCI journals. He has served as one of the main tutors for the PhD course on Additive Manufacturing and 3D Concrete Printing during RILEM Week 2023, and held positions as Secretary-General of the 3D Printing Committee of the Solid Waste Branch of the Chinese Ceramic Society, committee member of the RILEM TC 303-PFC and 304-ADC.

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