

RECENT RESEARCH ACTIVITIES ON LOW-CARBON AND RESILIENT INFRASTRUCTURES

Speaker

Prof. Yan Zhuge

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Abstract

Prof. Zhuge will present recent research advancements from her team in the areas of advanced cementitious composites and sustainable construction materials. The topics include: FRP/fibre textile-reinforced ultra-high-performance concrete (UHPC) composites, 3D-printed high-performance concrete (HPC) with co-extruded FRP grid reinforcement, green construction materials, and self-healing concrete technologies.

The first part of the presentation will introduce a series of novel FRP-UHPC tubular members, comprising UHPC bodies internally reinforced with carbon FRP in the form of either grids or bars. Additionally, recent developments in 3D-printed HPC plates incorporating co-extruded FRP grid reinforcement will be discussed. In the second half, the focus will shift to a novel self-healing system. An innovative capsule containing a blend of drinking water treatment sludge (DWTS) and calcium hydroxide ($\text{Ca}(\text{OH})_2$) is introduced as a sustainable healing agent for sealing concrete cracks. Experimental results show that cracks with an initial width of 400 μm were fully healed after 7 days of water curing, resulting in significant improvements in compressive strength and recovery of water permeability in the healed specimens.

Biography

Prof Yan Zhuge is a Professor of Structural Engineering and serves as the Professorial Lead in Research Education at the UniSA STEM, University of South Australia (UniSA). She has a BEng (Hons) in Civil Engineering and a Masters in Structural Engineering from Beijing, China, a PhD in Structural Engineering from Queensland University of Technology (QUT), Australia. Her primary research focuses on green concrete materials, fibre composite materials and structures. Yan has published 270+ SCI papers in the referred international journals and has been invited as a Plenary/keynote speaker at international conferences. Her contributions have garnered several Australian government awards and fellowships and attracted funding from the Australian Research Council (ARC) as well as industry partnerships. Yan held the position of a member in the ARC College of Experts from 2019-2025, and was the winner of 2018 South Australia Winnovation award in Engineering category. Yan is an elected fellow of Australian Academy of Technology and Engineering (ATSE).



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4:00pm - 5:00pm



**Civil Engineering
Conference Room
Room 3574 (Lift 27/28)**

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