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

SMART WATER ASSET MAINTENANCE USING ACOUSTIC SENSING

Speaker

Dr. Wei Zeng

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Abstract

Water losses in water distribution systems (WDSs) significantly contribute to economic costs and additional energy consumption. If leaks in WDSs are not repaired in time, they may develop into breaks, which can lead to traffic interruptions, property damage and negative publicity for water utilities. Emerging IoT sensing techniques have created opportunities for proactive break management and leak detection in WDSs. The daily acoustic data collected from distributed wireless acoustic IoT sensors contains significant information associated with potential leaks, thus enabling timely leak detection in the WDS and early warning of pipe breaks. A framework integrating different acoustic signal processing, data analytics and AI machine learning techniques for leak detection will be presented in this seminar.

Biography

Dr Wei Zeng's research focuses on maintenance of water distribution systems with different sensing techniques (e.g., IoT acoustic sensors, pressure measurement, optical fibre sensing), signal processing methods, data analytics and machine learning techniques. Additionally, he is developing advanced hydraulic and acoustic techniques for wastewater system management, including blockage and overflow detection. His research aims to protect critical water infrastructures, contributing to the sustainability of water systems.

His research outcomes have been commercialised through a start-up company specializing in IoT technologies for urban water systems and successfully implemented in real-world water networks, assisting multiple water utilities in enhancing their leak detection practices.

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10:30 am – 11:30 am

Room 6591 (Lift 30/31)
Academic Building
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