The Institution of Engineers, Malaysia

Webinar Talk

Digital Twin for Offshore Pipeline Systems: A Knowledge-Driven Approach to Asset Integrity and Smart Infrastructure”

Organised By :
Civil & Structural Engineering Technical Division, IEM

Date :
16th July 2026

Time :
3pm - 5pm

Venue :
Virtual Platform - ZOOM

BEM CPD: 2
Ref. No.: Applying

Registration Fees
IEM Student: FOC
IEM Members: RM15
NON-IEM Members: RM70

Speaker

Dr MOHAMAD SHAZWAN , AHMAD SHAH

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Synopsis

The talk “Digital Twin for Offshore Pipeline Systems: A Knowledge-Driven Approach to Asset Integrity and Smart Infrastructure” will explore how conventional civil and structural engineering knowledge can be progressively transformed into advanced applications in structural integrity, finite element modelling, monitoring, and digital twin technologies. Positioned in a light yet practical manner, the session will highlight how foundational engineering principles—such as fatigue and fracture mechanics, reliability assessment, and finite element analysis—serve as stepping stones toward modern innovations in offshore infrastructure management.

The presentation will demonstrate how digital twin frameworks, integrated with sensor data and predictive modelling, enable real-time monitoring and proactive asset management for offshore pipeline systems. By bridging traditional engineering practices with AI-driven simulations and smart infrastructure concepts, the talk emphasizes practical pathways for engineers to adapt and evolve in line with industry needs.

Additionally, the speaker will share how this research direction has grown from earlier experiences in structural engineering and reliability studies, culminating in a broader pursuit at Imperial College London. This journey illustrates the importance of combining academic research with practical applications to achieve resilient, sustainable, and intelligent offshore infrastructure solutions.

Speaker’s Biodata

Mohamad Shazwan bin Ahmad Shah, born on 14 May 1991, is a Malaysian structural engineer and researcher specializing in structural integrity, reliability engineering, fatigue and fracture mechanics. He holds a PhD in Civil Engineering from Universiti Teknologi Malaysia, with a focus on fatigue and fracture in concrete, a Master of Science in Structural Engineering from the University of Sheffield, UK, and a First-Class Bachelor of Civil Engineering from UTM. His expertise spans finite element analysis, probabilistic modeling, and AI-driven predictive maintenance, with applications in offshore platforms, pipelines, and industrial structures. He has contributed significantly to the Theory of Critical Distance (TCD) for fatigue characterization in concrete and has advanced digital twin technology for structural health monitoring. Professionally, he has served as a Graduate Engineer at IJM Land and as a consultant for Uni-Technologies Sdn. Bhd., delivering high-impact projects for clients such as Petronas, Ayamas Food Corporation, and Johor Port. He is also a Japan-ASEAN STI Fellow, a registered Graduate Engineer with BEM, and a Professional Technologist under MBOT.

Shazwan has published extensively in international journals and conferences, with research contributions ranging from offshore structural resilience to Martian concrete for space colonization. His work bridges academia, industry, and policy, reinforcing Malaysia’s engineering landscape while contributing to global priorities in infrastructure resilience and sustainable development.