Προσκεκλημένη Ομιλία
του καθ. Ihsan Bal

Στο πλαίσιο του Μεταπτυχιακού Προγράμματος "Σχεδιασμός ανθεκτικών, βιώσιμων και ευφυών υποδομών", το Τμήμα Πολιτικών Μηχανικών έχει την τιμή να φιλοξενήσει τον Δρ. Ihsan Bal, καθηγητή του Πανεπιστημίου Hanze (Ολλανδία), ο οποίος θα πραγματοποιήσει ομιλία με θέμα:

Digital Technologies in Structural Safety: Opportunities and Gaps Between AI and Engineering Practice

Η ομιλία θα πραγματοποιηθεί τη **Δευτέρα 2 Μαρτίου 2026, και ώρα 14:00-15:00** στο αμφιθέατρο «Μαστρογιάννης» του Τμήματος Πολιτικών Μηχανικών του Πανεπιστημίου Πατρών.

Η εκδήλωση είναι ανοικτή στο κοινό - δεν απαιτείται προεγγραφή για τη συμμετοχή.

Περίληψη

The presentation will address the role of digital technologies in improving structural safety, with particular emphasis on earthquakes and other extreme loading conditions affecting buildings and infrastructure. It comprises an overview of the current state of the art in digital solutions, including combination of artificial intelligence and image processing solutions for anomaly and damage detection. Recent advances in AI-based pattern recognition and automated inspections are discussed, highlighting their potential to transform structural assessment practices.

The presentation then shifts focus to real engineering projects and the built environment, identifying critical gaps between technological capabilities and practical engineering needs. While many advanced tools exist, they often fail to align with how engineers assess safety, interpret damage, and make decisions under uncertainty, especially during extreme loading, post-earthquake or emergency situations, or even in regular inspection processes. To identify this gap, several applied examples are presented. One example demonstrates the use of AI for crack detection and pixel-wise segmentation on masonry surfaces, showing how image-based methods can support quantitative damage assessment. Another example focuses on the inspection of Dutch dykes in the North Netherlands, a key component of the national water defense system. The presentation explains what engineers look for during dyke inspections and illustrates how existing digital technologies can enhance inspection efficiency, consistency, and decision support.