

Deep learning in SHM and beyond

Topic: Deep learning in structural engineering

TITLE: Physics-informed neural networks

RESEARCH BACKGROUND:

Machine learning methods usually fully rely on data to provide outputs, thus not necessarily sticking to the physics underlying complex phenomena. However, the physics of the problem can be used to improve the performance and generalization capability of machine learning methods.

RESEARCH ACTIVITIES:

1. Introduction to *physics-informed neural networks* (PINNs)
2. Application of PINNs to simple case studies
3. Development of PINNs to describe *ultrasonic guided waves* propagation and interaction with damage

METHODOLOGY: Analytical – Numerical

DURATION: 7-9 months

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