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Application of machine learning with impedance based techniques for structural health monitoring of civil infrastructure (Article) (Open Access)

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Abstract

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Increased attentiveness on the environmental and effects of aging, deterioration and extreme events on civil infrastructure has created the need for more advanced damage detection tools and structural health monitoring (SHM). Today, these tasks are performed by signal processing, visual inspection techniques along with traditional well known impedance based health monitoring EMI technique. New research areas have been explored that improves damage detection at incipient stage and when the damage is substantial. Addressing these issues at early age prevents catastrophe situation for the safety of human lives. To improve the existing damage detection newly developed techniques in conjugation with EMI innovative new sensors, signal processing and soft computing techniques are discussed in details this paper. The advanced techniques (soft computing, signal processing, visual based, embedded IOT) are employed as a global method in prediction, to identify, locate, optimize, the damage area and deterioration. The amount and severity, multiple cracks on civil infrastructure like concrete and RC structures (beams and bridges) using above techniques along with EMI technique and use of PZT transducer. In addition to survey advanced innovative signal processing, machine learning techniques civil infrastructure connected to IOT that can make infrastructure smart and increases its efficiency that is aimed at socioeconomic, environmental and sustainable development. ©BEIESP.

SciVal Topic Prominence

Topic: Structural health monitoring | Damage detection | Smart aggregates

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