

A PROPOSAL TO FACILITATE MANDATORY BRIDGE LOAD TESTS WITH ARTIFICIAL NEURAL NETWORK ANALYSES USING A DIGITAL DATA AGGREGATION PLATFORM

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Abstract

The paper presents an innovative concept of digital aggregation of data related to mandatory in-situ load tests of bridge structures. The proposed approach allows to manage various types of information regarding those experiments, in a way which is consistent with current good practises in BIM technology and digitalisation of construction industry. The proposed web platform will allow for vast improvements in decision-making process regarding admission of a given bridge for service, in proper analyses and even predictions of bridges mechanical response. Initial architecture of the system is introduced along with an appropriate literature review and the identification of key actors and their roles in the described information management process. To highlight the potential of the solution, two examples are shown. In both cases key advantages of digital aggregation are emphasised: the possibility to learn from previous analogical in-situ experiments, and the possibility to utilise modern machine learning algorithms and state-of-the-art open-source solutions.

Keywords: Bridge load tests; TensorFlow; Neural networks; API, BIM, Digitalization.