Scour assessment by identification of soil stiffness change from vibration monitoring

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【Background】

It was found that the most common cause of bridge failures is from flood scouring bed material surrounding bridge foundations. In previous studies we use impact test on the bridge pier to identify changes in frequencies, which is a promising and conventional way of scour detection and then we have the real-time monitoring method which is a remote vibration monitoring for scour detection that guarantees highly frequent real-time scour inspection.

While in the majority of cases, it is very challenging to identify the soil condition around the bridge pier.

【Objective】

Use idealized model to simulate the soil interaction under target pier identify the change of soil stiffness based on decreasing of target frequency

【Approach】

By conducting combination of ANN (artificial neural network) and GA (genetic algorithm) which can help me finish the model updating and obtain the optimal group of spring stiffness with the target frequency.

【Publication plan】

・69th JSCE Annual Conference
・ICOSSAR 2021-2022,13th International Conference on Structural Safety & Reliability

【Results】

The Accuracy of ANN is 0.998 calculated by Coefficient of determination R^2 (the proportion of the variance in the dependent variable that is predictable from the independent variable)