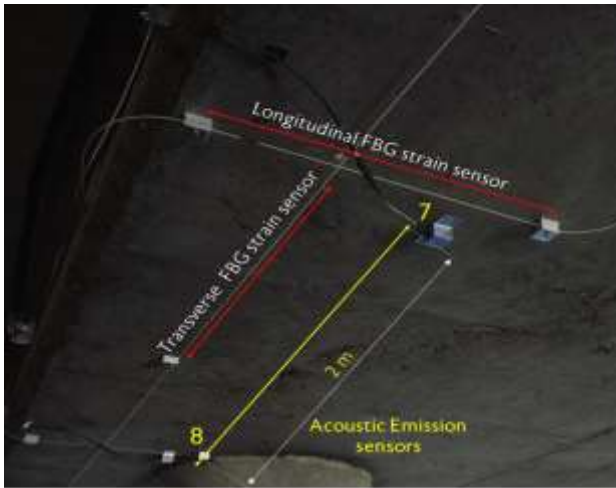


# Listening to concrete to enable infrastructure intelligence

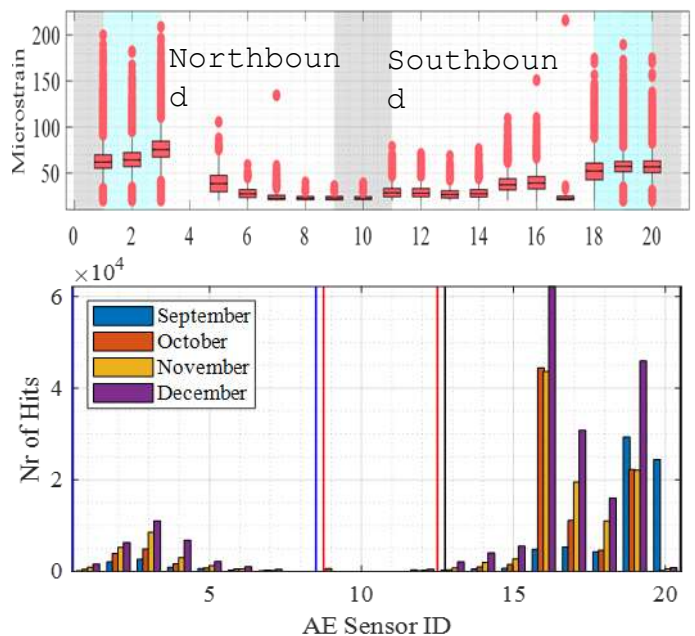
## Motivation

A structural health monitoring system based on Acoustic Emission (AE) testing is installed on a concrete half-joint bridge. The project aims to benefit maintenance activities by providing early indicators of deterioration.



## Monitoring system

A multi-sensing system has been installed on a half-joint nib, comprising twenty AE and eighty fibre optic strain and temperature sensors. The system provides continuous in-service data from a motorway bridge.



## Results

A cross-correlation between the peak vertical strain and AE hits for each sensor across the transverse direction of the half-joint is shown. Despite the strain distribution being symmetrical for both traffic directions, the recorded AE activity – a measure of signal intensity, was higher on the southbound direction. Extracted from AE signals can be employed as indicators for deterioration to enhance inspections in the field. In addition, it was found that mapping of areas of high AE activity is feasible with short-term AE monitoring campaigns.

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