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Award-winning paper in 2022.

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Announcement

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Smart Infrastructure and Construction



Award-winning paper in 2022

Papers published in *Smart Infrastructure and Construction* are eligible for awards from the Institution of Civil Engineers. Papers from any of the ICE journals can be nominated for several awards. In addition, each journal has awards dedicated to their specific subject area.

On Friday 13 October 2023, ICE president Keith Howells presented an award to the following paper published in *Smart Infrastructure and Construction* in 2022. The editorial panel nominated their best papers and an awards committee chaired by Tim Broyd allocated the awards.

Telford Premium Prize

The Telford Premium Prize, presented to the best paper published in *Smart Infrastructure and Construction*, was awarded to Maroni *et al.* (2022).



Thomas Telford Premium Prize winners (left to right, from second left) Enrico Tubaldi, Hazel McDonald and Daniele Zonta with ICE president Keith Howells

Abstract

Flood-induced scour is the principal cause of bridge failure worldwide. Nevertheless, bridge scour risk assessment is still based on visual inspections, which may be affected by human errors and cannot be performed during flood peaks. This problem, together with the simplifications in scour estimation, might cause misclassification of the bridge scour risk, unnecessary bridge closures or recourse to avoidable scour mitigation measures. Structural-health-monitoring (SHM) systems allow overcoming these issues, providing bridge managers with more accurate information about scour, thus supporting them in taking optimal management decisions. This paper illustrates the development of an SHM- and event-based classification system for bridge scour management, which extends and complements current risk-rating procedures by incorporating the various sources of uncertainty characterising the scour estimation and information from different sensors. The proposed system is based on a probabilistic framework for scour risk estimation and can be used to provide transport agencies with real-time scour risk classification of bridges under a heavy-flood event. The system is applied to a bridge network located in south-west Scotland in a heavy-flood scenario, and information from heterogeneous sources is considered for updating the knowledge of scour. It is shown that integrating scour-monitoring data leads to an overall uncertainty reduction that is reflected in more accurate scour risk classification, thus helping transport agencies in prioritising bridge inspections and risk mitigation actions.

REFERENCE

Maroni A, Tubaldi E, McDonald H and Zonta D (2022) A monitoring-based classification system for risk management of bridge scour. *Proceedings of the Institution of Civil Engineers – Smart Infrastructure and Construction* **175(2)**: 92–102, <https://doi.org/10.1680/jsmic.21.00016>.