

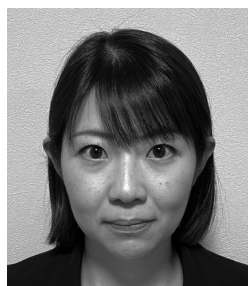
## **FUTURE EVALUATION OF REPAIR EFFECT ON SALT DAMAGE PROGRESS AND LOAD CARRYING CAPACITY FOR RC JETTY SUPERSTRUCTURE USING MULTI-SCALE ANALYSIS**

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### Reasons for the Award

This paper summarizes analytical studies that support rational future operation and maintenance of structures by reproducing the relationship between material degradation, various repair scenarios, and the condition and response of structures in a corrosion environment using a digital twin in cyberspace. A key feature is the application of multi-scale, multiphysics integrated analysis, coupling materials and structures, to evaluate the progression of salt damage degradation over time since construction, specifically targeting the superstructure of a pier that has been in service for over 35 years. In modeling data from the existing structure, the analysis integrates modeling of chloride ion penetration based on measured environmental conditions with the resulting reinforcement corrosion and crack initiation. It also attempts to predict performance metrics such as load-bearing capacity after 100 years. Although further verification of the validity of the analysis results is required, it has yielded extremely important insights for systematizing maintenance based on future deterioration predictions and is evaluated as contributing to the advancement of concrete engineering.

As described above, this paper has uncovered numerous insights regarding the effectiveness and practicality of analytical studies on existing structures and is deemed worthy of the paper award.