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Long-term, Reinforced Concrete Performance Modeling Software

Researchers at Stanford University, Technical University of Denmark, and Norwegian University of Science and Technology have developed a software suite that can predict long-term performance of reinforced concrete based on multiple, fundamental, physics phenomenon like humidity, temperature, ion transport, steel-concrete electrochemistry, and fracture of brittle matrix composites. This software can link with distributed sensing networks that monitor environmental data (e.g., temperature, relatively humidity, surface ion concentrations) providing more accurate performance predictions. Long-term modeling of reinforced concrete performance is critical for management, repair, assessment, and financing of reinforced concrete building elements like roads, bridges, dams, etc. making this software an essential infrastructure management tool for financiers of infrastructure, municipalities, utilities, transportation departments, etc.

Stage of Development – Prototype
Researchers continue to test, improve, and integrate a graphical user interface to increase usability.

Applications

- **Infrastructure asset management** – monitoring and maintenance of concrete elements (e.g. roads, bridges, dams) by municipalities, power providers, wastewater treatment providers, transportation departments, financiers of infrastructure, etc.

Advantages

- **More accurate**, long term prediction and modelling that **links to actual environmental sensors**.

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