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DEPARTMENT OF
SCIENCE & TECHNOLOGY
सत्यमेव जयते

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TECHNOLOGY
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PENDING

(IN202311076103) Online estimation of axial stresses using modal properties of hangers in network arch bridge

NEED

Bridge hangers are prone to unpredictable tension shifts due to wind, load variations, or thermal expansion. Undetected, these shifts trigger cable slack, deformation, or even collapse. What if bridge stress could be seen—before it caused failure?

TECHNOLOGY OVERVIEW

This system uses sensor-based vibration data and advanced models to estimate axial stress in arch bridge hangers. It continuously monitors modal properties, helping engineers adjust hanger tension proactively—preventing mechanical fatigue, misalignment, and structural breakdown without halting bridge operations.

TECHNOLOGY KEY FEATURES

Integrates vibration sensors, machine learning, and FEM models; provides continuous stress monitoring; prevents compression risks; supports tension adjustment; no dismantling required; ideal for bridge retrofit and safety audits.

Read more here

MARKET ANALYSIS

The global structural health monitoring (SHM) market is projected to grow at 14.2% CAGR, reaching $8.2B by 2033. India's infrastructure investments are expected to rise to $1.4T by 2030, accelerating demand for predictive bridge safety technologies. [Sources: Precedence Research 2024, IBEF, NITI Aayog]

Target Industries

Infrastructure authorities: For bridge maintenance digitization. Civil engineering firms: For retrofitting legacy bridges. SHM platform developers: For integrating predictive analytics in road and rail bridge networks.

AT A GLANCE

SDG 9 (Industry, Innovation and Infrastructure), SDG 11 (Sustainable Cities and Communities), SDG 13 (Climate Action)

Technology is available for licensing/ co-development.

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