

## PROJECT OVERVIEW REPORT

1. UTC Identifying Number  
69A3551847102
2. Center Identifying Number  
CAIT-UTC-REG50
3. Project Title  
Post-disaster Damage Assessment of Bridge Systems
4. Principal Investigator & Contact Information  
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7. Project Description  
Leveraging recent advances in artificial intelligence, a novel signal processing technique will be developed to build a surrogate model for an accurate prediction of engineering demand parameters of interest (e.g., peak column drift ratio). The epistemic uncertainty of the surrogate model will be quantified and integrated with other uncertainties in performance-based engineering methodology so that rapid condition assessment and loss estimation can be provided in a probabilistic manner. The proposed framework will be first verified through the data generated using finite element analyses, and its reliability will be validated through proof-of-concept experiments.
8. Implementation of Research Outcomes (or why not implemented)  
The intended outcome of the project is the development of a sensor-based framework for reliable post-disaster damage assessment of bridge systems. This technology is expected to automate the process of damage detection, and to assess and identify risks associated with each bridge immediately after a natural

disaster. Practical guidelines to implement the methodology will be prepared, with input from the industry collaborators.

9. Impacts/Benefits of Implementation (actual, not anticipated)  
To Be Determined

10. Dates and Budget

Start date: 2/1/2021

End date: 1/31/2022

UTC (CAIT) Dollars: \$29,873

Cost Sharing: \$32,444

Total Dollars: \$62,317

11. Keywords

Structural health monitoring, artificial intelligence, disaster, risk-informed, bridge systems

12. Web Links (Reports and Project Website)

<https://cait.rutgers.edu/research/post-disaster-damage-assessment-of-bridge-systems/>