UTC Project Information – Project 1.15	
Project Title	Non-contact intelligent inspection of infrastructure
University	University of Connecticut (UConn), Storrs, CT
Principal Investigator	Jiong Tang, Ph.D.
PI Contact Information	Email: jiong.tang@uconn.edu; Phone: (860) 486 5911; Address: Department of Mechanical Engineering, 191 Auditorium Road, Unit 3139, Storrs, CT 06269.
Funding Source(s) and Amounts Provided (by each agency or organization)	Federal: $78,402 UConn: $78,444
Total Project Cost	$156,846
Agency ID or Contract Number	69A3551847101
Start and End Dates	August 01, 2021 – July 31, 2023
Brief Description of Research Project	The objective of this research is to develop non-contact sensing mechanism for infrastructure monitoring as well as the associated machine-learning based technique for decision making. Currently available sensory systems for structural health monitoring are almost all based on transducers that are directly attached to or embedded in structures monitored. As a result, they face with critical barriers, such as extremely high implementation cost in very large scale structures and relatively high false alarm rate due to malfunction of sensors themselves. The non-contact nature of the proposed sensing modality will cause paradigm shift: it leads to mobile sensory system that can monitor very large scale structures employing only a small number of sensors, and it allows us to increase considerably the confidence level of structural health monitoring. In this research, concurrent breakthroughs in sensor synthesis and data analysis will be pursued. We will (a) develop a new non-contact impedance-based sensing mechanism via two-way magneto-mechanical dynamic interaction that is enhanced by adaptive electrical circuitry integration, which facilitates the tunable high-frequency interrogation to disclose structural anomaly; and (b) formulate accurate and robust decision making strategies that that take full advantage of the new machine learning techniques. Potential applications are large-scale infrastructure components such as railway tracks.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	This project is in its initial research phase. Implementation of Research outcomes will be reported upon completion of initial research.
Impacts/Benefits of Implementation (actual, not anticipated)	This project is in its initial research phase. Impacts and benefits of the research will be reported after the implementation phase.

Web Links	
• Reports • Project website	