

PROJECT OVERVIEW REPORT

1. UTC Identifying Number
69A3551847102
2. Center Identifying Number
CAIT-UTC-REG47
3. Project Title
Remote Sensing System Enhancement for Digital Twinning of the Built Infrastructure to Support Critical Infrastructure Protection Research
4. Principal Investigator & Contact Information
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7. Project Description
The concept of digital twins is an enabler to address today's infrastructure lifecycle management challenges, especially in this challenging era with the growing threats of pandemics, natural disasters, funding shortfalls, and social unrests. Digital twins support cost-effective ways of exploring what-if scenarios from which the most effective interventions can be identified. The resilience research group at Rutgers Center for Advanced Infrastructure and Transportation (CAIT) has been conducting pioneering research studies in the last decade along the dimensions of leveraging Geomatics Engineering technologies such as laser scanning to create high fidelity digital twins to support critical infrastructure protection. The purpose of this project is to acquire a new terrestrial laser scanner - Faro Focus S350 to further support and strengthen this line of research projects. The addition of this proposed scanner will enable new research studies in digital twinning of the built infrastructure to support mitigation of flood threats to

critical transit stations and evaluation of disinfection methods for transportation facilities.

8. Implementation of Research Outcomes (or why not implemented)

The intended outcomes of the project are 1) a digital twin product for infrastructure stakeholders; (2) a generalizable workflow in creating digital twins with terrestrial laser scanners; and 3) new software applications based on digital twins aimed for critical infrastructure protection use cases. These tools and data are expected to aid infrastructure stakeholders to prioritize their investments on addressing infrastructure vulnerabilities to coastal flooding and consequently prolong the life of infrastructure. The outcomes will be documented in software products, training modules, technical reports, and peer-reviewed publications.

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

To Be Determined

10. Dates and Budget

Start date: 2/1/2021

End date: 5/31/2022

UTC (CAIT) Dollars: \$56,541

Cost Sharing: \$14,869

Total Dollars: \$71,410

11. Keywords

Digital Twinning, Infrastructure Resilience, Laser Scanning, Decision Support

12. Web Links (Reports and Project Website)

<https://cait.rutgers.edu/research/remote-sensing-system-enhancement-for-digital-twinning-of-the-built-infrastructure-to-support-critical-infrastructure-protection-research/>