Framework for Digital Twins in the Built Environment

This position is part of the National Institute of Standards (NIST) Professional Research Experience (PREP) program. NIST recognizes that its research staff may wish to collaborate with researchers at academic institutions on specific projects of mutual interest, thus requires that such institutions must be the recipient of a PREP award. The PREP program requires staff from a wide range of backgrounds to work on scientific research in many areas. Employees in this position will perform technical work that underpins the scientific research of the collaboration.

This project focuses on developing a foundational framework to support organizations in understanding, evaluating, and leveraging digital twin technologies specifically in the built environment. As digital twins (DTs) continue to gain traction across industries for their ability to virtually replicate physical assets, there remains a critical gap in how organizations assess the quality and value of DT solutions, especially when services are procured from external vendors. This project aims to address the maturity, functionality, and alignment of DT solutions with their operational needs. The framework will serve as a decision-support tool for stakeholders to critically evaluate vendor offerings and make informed choices about DT implementation. Additionally, this project represents the initial phase in a broader effort to develop standardized guidelines and templates for DT assessment. These resources will support transparency, promote consistency, and reduce ambiguity in DT-related procurement and deployment processes. By providing a structured approach to DT evaluation, the project will empower organizations to better manage risks, ensure return on investment, and accelerate the adoption of high-quality DT solutions that align with their strategic goals.

US Citizen Preferred

Key responsibilities:

- Lead the development of a structured framework for evaluating digital twin solutions, focusing on maturity, functionality, and alignment with strategic goals
- Collaborate with interdisciplinary stakeholders, including industry partners, to gather insights and validate the framework
- Design and validate assessment templates for digital twin procurement and implementation
- Disseminate findings through guidelines, technical reports, conference presentations, and publications
- Support in contributing to the long-term roadmap for establishing DT evaluation standards.

Qualifications

- Ph.D. degree in Computer Science, Engineering, Manufacturing, or a related field.
- Ability to understand, develop, and use applications related to Digital Twin solutions for buildings.
- In-depth understanding of current open-source tools and open standards related to buildings.

Please upload the following (preferably in a single PDF) with your application:

- Research proposal

Privacy Act Statement

Authority: 15 U.S.C. § 278g-1(e)(1) and (e)(3) and 15 U.S.C. § 272(b) and (c)

Purpose: The National Institute for Standards and Technology (NIST) hosts the [Professional Research Experience Program (PREP)](#) which is designed to provide valuable laboratory experience and financial assistance to undergraduates, post-bachelor's degree holders, graduate students, master's degree holders, postdocs, and faculty.

PREP is a 5-year cooperative agreement between NIST laboratories and participating PREP Universities to establish a collaborative research relationship between NIST and U.S. institutions of higher education in the following disciplines including (but may not be limited to) biochemistry, biological sciences, chemistry, computer science, engineering, electronics, materials science, mathematics, nanoscale science, neutron science, physical science, physics, and statistics. This collection of information is needed to facilitate administrative functions of the PREP Program.

Routine Uses: NIST will use the information collected to perform the requisite reviews of the applications to determine eligibility, and to meet programmatic requirements. Disclosure of this information is also subject to all the published routine uses as identified in the Privacy Act System of Records Notices: NIST-1: NIST Associates.

Disclosure: Furnishing this information is voluntary. When you submit the form, you are indicating your voluntary consent for NIST to use of the information you submit for the purpose stated.