

REscan Inc. Abstract:

Military installations and operational environments often lack current, high-fidelity spatial data needed to support planning, training, and emergency response. This gap can limit situational awareness and slow decision-making during critical events, including emergency response scenarios.

This presentation examines an approach to improving mission readiness through rapid 3D reality capture and the development of accessible digital twin environments. Using a wearable, human-perspective capture system, environments can be scanned quickly without requiring disruption to ongoing operations. This method reduces the time and complexity associated with traditional static scanning approaches and enables more frequent updates to spatial data.

The supporting software pipeline processes captured data into interactive, geo-referenced 3D environments that can be accessed through standard browsers, immersive VR systems, and existing geospatial platforms. These environments support use cases such as pre-incident planning, infrastructure familiarization, and coordination across teams. Users can navigate environments virtually, perform measurements, and access relevant facility information within a unified interface. Spatial AI capabilities further support AI-assisted object identification, environment search functions, and automated processing workflows that reduce manual data review and improve accessibility of mission-relevant information.

These environments also support real property and facility management functions, including space utilization, asset tracking, and infrastructure planning, and can complement installation data systems such as GeoBase. Ongoing integration efforts with operational and training platforms, including ArcGIS, TAK, and immersive training systems, demonstrate how digital twin environments can enhance mission planning, emergency response, and installation readiness.

This presentation will also discuss a decentralized approach to data collection, enabling personnel to capture and maintain their own environments using lightweight systems. This model supports more current datasets and reduces reliance on specialized teams for updates.

Initial efforts supporting Air Force and Space Force civil engineering and fire emergency services organizations at Patrick Space Force Base, Vandenberg Space Force Base, and Wright-Patterson Air Force Base demonstrate the potential to enhance preparedness, improve coordination, and support faster, more informed decision-making. Key considerations for implementation, including data management, scalability, interoperability, and integration challenges, will also be addressed.