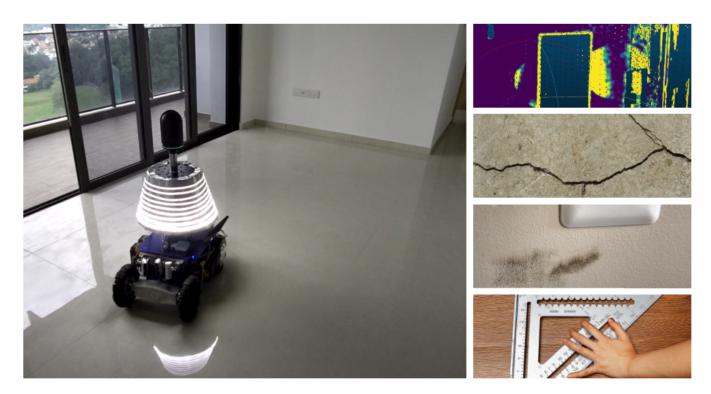**TECH OFFER**

Autonomous Built Environment Inspection

KEY INFORMATION

TECHNOLOGY CATEGORY:

Infocomm - Artificial Intelligence

Infocomm - Video/Image Analysis & Computer Vision

Electronics - Sensors & Instrumentation

TECHNOLOGY READINESS LEVEL (TRL): TRL7

COUNTRY: SINGAPORE

ID NUMBER: TO174991

OVERVIEW

Manual built environment inspection suffers from multiple issues such as shortage of manpower, human error and miscommunication. To overcome these issues, there is a need for an automated and centralized inspection system capable of detecting multiple defects of interest and presenting the inspection results in an easy to access format.

The technology presented uses data acquired from LiDAR and Cameras mounted on an autonomous robot to inspect building interiors and external facades. The system utilizes an AI engine and can accurately detect defects such as cracks, holes, and other built imperfections stated in building quality guidelines such as CONQUAS. Defect reports can be autonomously generated after the acquired image and LiDAR data has been processed by the AI analytics engine.

TECHNOLOGY FEATURES & SPECIFICATIONS

The system is composed of an autonomous robot with a mounted camera and LiDAR and has the following features -

- Support for multiple hardware platforms such as wheeled robots and drones to allow the use of most suitable means of inspection.
- AI based defect detection for cracks, holes, stains, cornerness, and other structural and visual defects at >3mm unevenness.
- Capability to inspect for air quality, hazard detection and safety monitoring (PPE Detection).
- Simple and intuitive user interface with customizable repots minimizing possibility of miscommunication.
- Generation of defect reports compliant to Singapore Building and Construction Authority recommendations for Built Environment - CONQUAS.
- Defect and user management system.
- Capability to integrate with external Building Information Management (BIM) systems and third party apps.

POTENTIAL APPLICATIONS

The system can be used for digitalization and autonomous inspection of built environments. It covers both the indoor and outdoor inspection by allowing use of multiple robot platforms. With the removal of manual inspection requirements, the system helps improve the consistency and objectiveness of inspections and helps in increasing productivity. The technology is applicaple for tasks related to management of a building from construction to maintenance.

UNIQUE VALUE PROPOSITION

By automating and centralizing the built environment inspection, the system improves productivity, significantly reduces the time required by the inspection process, and improves the safetly of the personnel involved. The solution is useful during the entire lifecycle from construction to maintainence and provides automated reports compliant to recommendations of the Singapore Building and Construction Authority. The solution can potentially cut down the time required for inspection by several hours per residential or commercial unit.