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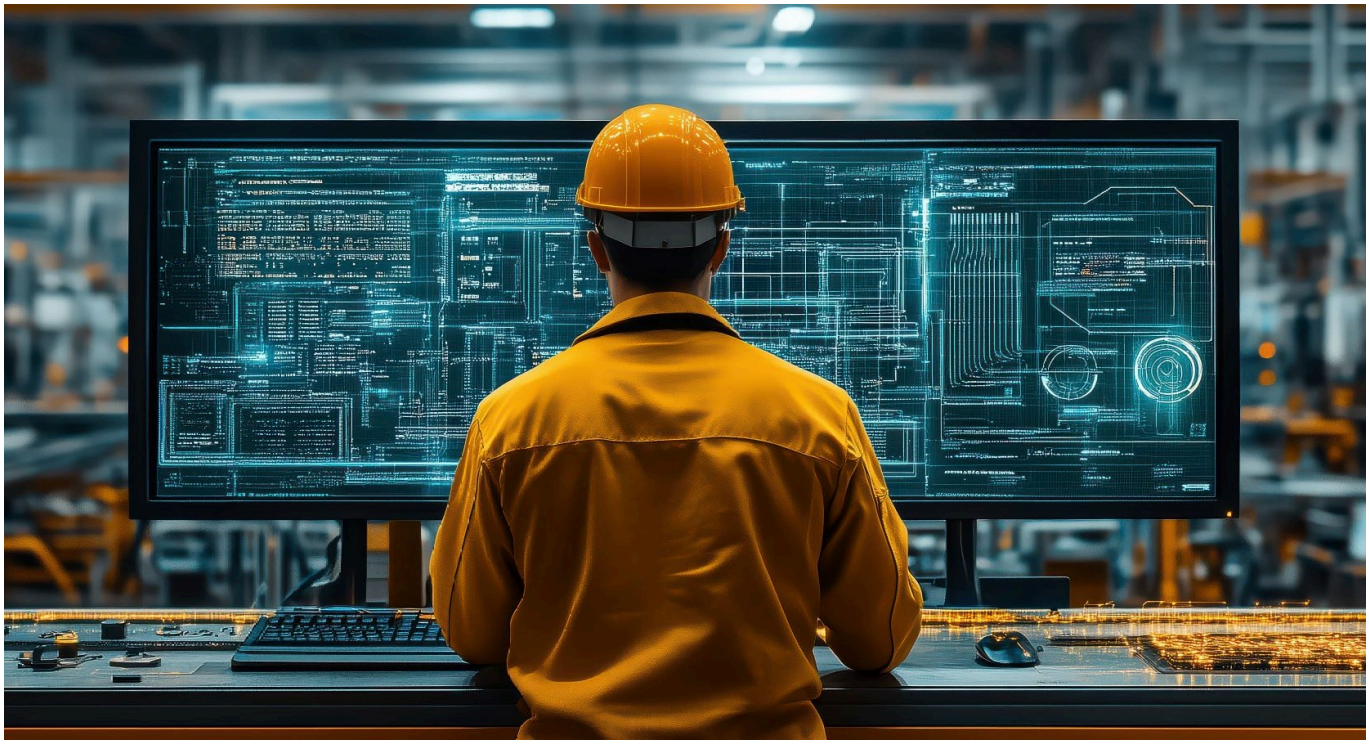
TECH OFFER

AI Automated Visual Inspection System



KEY INFORMATION

TECHNOLOGY CATEGORY:
Infocomm - Artificial Intelligence
Infocomm - Video/Image Analysis & Computer Vision

TECHNOLOGY READINESS LEVEL (TRL): TRL6
COUNTRY: SINGAPORE
ID NUMBER: TO175320

OVERVIEW

Within the aerospace, marine and construction industries today, inspections are performed manually. It is a laborious process that is reliant on the experience and physical condition of the inspector, which could introduce human error and work-at-height risks.

The AI Automated Visual Inspection System utilises overhead high-resolution cameras with AI-based computer vision capability and autonomous robots with 3D localisation capabilities to detect various defects on a large structure, such as airframe, ship hull and building infrastructure. Through advanced machine learning methods, this technology provides an intelligent recognition system to identify 30 known defect types, such as surface dents, scratches, cracks and loose screws at a faster rate. For example, in Aerospace MRO, a grounded aircraft due to technical issues can cost airlines $10K/hr depending on the aircraft model and airline. This technology can potentially reduce the time needed for physical inspection of a commercial aircraft by 20-30%. This system can also be customised and applied to other manual inspection processes that will benefit from automation, consistency and worker safety.

TECHNOLOGY FEATURES & SPECIFICATIONS

- **Visual Inspection for large infrastructure*:*** Automatic visual inspection of large structures through integration of autonomous robots with customised infrastructure and overhead camera network.
- **Reduced time spent on inspection:** Potentially reduce the time needed for physical inspection of a commercial aircraft by 20-30%.
- **Customisable detection:** Custom-built machine learning models in the detection of surface defects.
- **Suitable for different environmental conditions:** Adaptive solutions that account for variations in lighting. Effective defect detection for surface angles within 35 degrees.
- **Built-in collision detection:** Robot collision avoidance of surrounding objects and people, with 3D localisation. No infrastructure/beacons required.
- **User friendly:** Effective UI with visualisation and camera control features.

POTENTIAL APPLICATIONS

- **Aerospace industry:** Inspection in airframe, engine, landing gear
- **Maritime industry:** Inspection of ship hull, shipment containers
- **Building and construction:** Inspection of facade, ceilings and high walls
- **Manufacturing and production:** Any applications that require automated and smart monitoring

MARKET TRENDS & OPPORTUNITIES

There has been a shift to automated inspection process in many industries such as aerospace, maritime, construction and other infrastructure. This is due to improved efficiency, quality, consistency and safety. Automated Solutions for MRO is forecasted to grow by USD 54.08B from 2023 to 2028.

UNIQUE VALUE PROPOSITION

- **Efficiency:** Visual Inspection algorithms can inspect surfaces for defects or anomalies quickly and can be performed anytime.
- **Better quality and consistency:** Using inspection software eliminate human error and deliver consistent inspection quality.
- **Digitisation of inspection reports:** Automated record-keeping, training, defect tracking.
- **Increased safety with less work-at-height risk:** Automated visual inspection at height can be conducted by camera-mounted drones or infrastructure-mounted cameras. Robots with cameras can also be used in unsafe environments (e.g. chemicals, tight spaces).