IPI SINGAPORE Innovation Partner for Impact

TECH OFFER

AI Platform for Auto Defect Classification, Equipment Automation, and Root Cause Mapping

KEY INFORMATION

TECHNOLOGY CATEGORY:
Manufacturing - Assembly, Automation & Robotics

TECHNOLOGY READINESS LEVEL (TRL): TRL9
COUNTRY: SINGAPORE
ID NUMBER: TO174943

OVERVIEW

In precision manufacturing, the ability to maintain optimum efficiency and accuracy is of critical importance. This AI Platform addresses these challenges by utilizing proprietary self-improving AI models for Automatic Defect Classification (ADC). This innovative solution incorporates AI Equipment Automation and Root Cause Mapping and provides a comprehensive system that significantly enhances production efficiency. The system seamlessly integrates Equipment Risk Analysis into existing alert mechanisms thus reducing downtime and increasing yield. At its core, it operates as a robust AI platform, featuring a user-centric interface for Machine Learning Operations (MLOps). This promotes recipe-free inspection while maintaining compatibility with a broad range of third-party software. The technology is modular and provides smooth productization of multiple AI solutions thereby increasing the effectiveness of defect inspection and analysis, assisting in equipment error recovery, and providing insights for process optimization. The technology offers an attractive solution for manufacturers across different industries interested in increasing their production efficiency and improving product quality.

TECHNOLOGY FEATURES & SPECIFICATIONS

The technology features AI at its core to provide multiple AI tools in a modularized form for different inspection, maintenance, and process control related tasks common in precision manufacturing industry:

- High precision recipe-free AI based visual defect inspection and classification.
- Root cause mapping for indicating errors in upstream process.
- Non-intrusive equipment run status monitoring and error assist using learned behaviour from UI messages and operator interventions.
- Equipment health monitoring and logging.
- Equipment insight generation for process optimization and recipe refinement.
- Checklist based assistance and tracking for preventive maintenance and assists.
- Predictive maintenance capability.

Ideal collaboration partners span semiconductor manufacturers, pharmaceutical firms and other precision manufacturing industries, hardware manufacturers for the production and upgrades of the vision systems, and research institutions focusing on AI.

POTENTIAL APPLICATIONS

This technology has applications in the manufacturing operations for the following industries:

- MedTech
- Pharmaceuticals
- Semiconductor
- Electronics
- Automotive
- Precision Engineering
- Aerospace

MARKET TRENDS & OPPORTUNITIES

With the projected growth and with production schedules becoming increasingly demanding, the ability to harness the power of artificial intelligence for predictive maintenance, process optimization, and quality control is a game-changer. These tools not only enhance the overall productivity but also enable companies to maintain a competitive edge in an ever-evolving landscape.

This technology is particularly attractive to these markets due to its ability to drastically reduce scrap rates and improve OEE (Overall Equipment Efficiency), thereby leading to significant cost savings. The growing trend of automation and AI adoption in manufacturing presents a substantial market opportunity for this technology.

UNIQUE VALUE PROPOSITION

The unique value proposition of the AI platform lies in its increased precision, flexibility, scalability, and seamless integration into existing manufacturing ecosystems:

- The solution does not require a complete overhaul of the existing setup.
- The solution includes a full toolset for autonomous operations - standalone AI assisted inspection, preventive maintenance, modules for reducing machine downtimes and manual assists (OEE).
- All actions taken are fully tracked for unique insights, root cause analysis, assisted recipe creation and process optimization.
- Flexible and capable of integrating techniques, like hyperspectral imaging, for insights into material properties among others.
- Modular and capable of adapting to various operational needs spanning different industries.
- Cost effective and easy integration to existing manufacturing lines.