

Our Collaborators

Supporting Organizations



Supporting Companies



Technological Collaborator



Industrial Collaborators



Smart Living



Smart Mobility



Smart Environment



Smart Sensors & IoT



Advanced Manufacturing



Electronics & Microelectronics

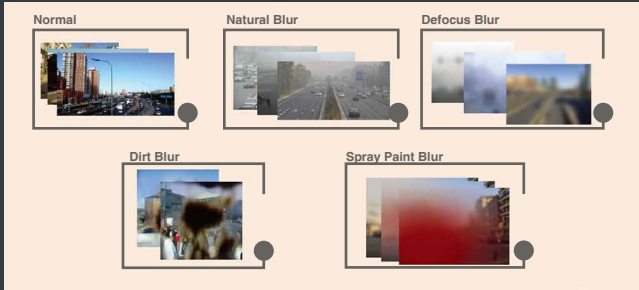


*Names are listed in alphabetical order

Our Achievements

Video Camera Anomaly Detection System

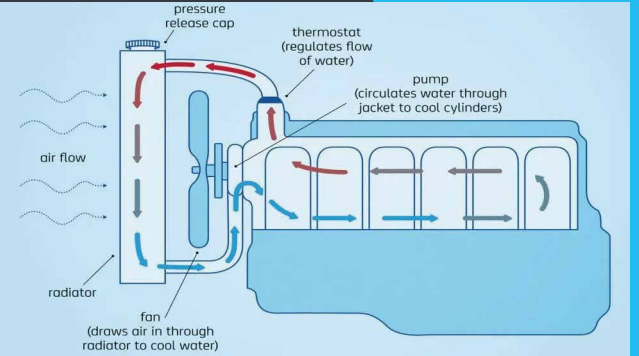
Surveillance camera is commonly used nowadays. CAiRS has developed an automatic fault reporting system for surveillance camera using artificial intelligence (AI) technique. It allows real-time detection of different blur anomalies. Our solution successfully replaces manual work, enables real-time anomaly detection, and reduces field service or video surveillance downtime.



Filed Patents
I. 監控攝像機異常檢測系統和方法 System and Method for Surveillance Camera Anomaly Detection
PRC Invention Patent Application no. 202211032284.3
II. System and Method for Spray Paint Image Synthesis in Surveillance Camera Anomaly Detection
Hong Kong Short Term Patent Publication no. 30076502 A

Fault Diagnosis & Predictive Maintenance for Engine Cooling System

Vehicle engine overheating incidents due to breakdown of components would eventually result in service disruption on the road. CAiRS has studied and identified the key parameters associated with the health status of engine cooling system. Fault diagnosis with AI ensemble methods for predictive maintenance is required. Our solution successfully reduces component field failure and the corresponding cooling system on-the-road service disruption.



Filed Patents
車輛節溫器異常檢測方法及系統 System and Method of Anomaly Detection of Thermostat in a Vehicle
PRC Invention Patent Application no. 202211063009.8



CAiRS

產品可靠性暨系統安全研發中心
CENTRE FOR ADVANCES IN RELIABILITY AND SAFETY
A Research Centre admitted under AIR@InnoHK Cluster



Our Laboratories

We have our own laboratories and supercomputer that facilitate the data collection from a wide variety of components, products, or systems for our research projects. Below are some of the equipment and please, visit our website for details.

HIGH PERFORMANCE COMPUTING



Supercomputer
NVIDIA DGX A100

LIFE CYCLE ASSESSMENT



Powertester

LIFE CYCLE ASSESSMENT



Power Device
Analyzer

LIFE CYCLE ASSESSMENT



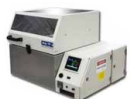
Interrogator

TEMPERATURE & ENVIRONMENT TESTING



High Temperature
Oven

LIFE CYCLE ASSESSMENT



Benchtop Vibration
Table

LIFE CYCLE ASSESSMENT



Battery Charge/
Discharge Testing
System

LIFE CYCLE ASSESSMENT



Shock Machine

TEMPERATURE & ENVIRONMENT TESTING



Temperature and
Humidity
Chamber

TEMPERATURE & ENVIRONMENT TESTING



Highly Accelerated
Stress Test
(HAST) Chamber

TEMPERATURE & ENVIRONMENT TESTING



Thermal Shock
Chamber

FAILURE ANALYSIS



X-Ray
Microscopy

FAILURE ANALYSIS



X-Ray Fluorescence
Spectrometer

FAILURE ANALYSIS



Electrodynamic
Tester

FAILURE ANALYSIS



Nanoindenter

FAILURE ANALYSIS



Scanning Acoustic
Microscope

About CAiRS

The Centre for Advances in Reliability and Safety (CAiRS) was initiated by Hong Kong Polytechnic University (PolyU) & the Center for Advanced Life Cycle Engineering (CALCE) of the University of Maryland, College Park, USA (UMD) in July 2020.

Our mission is to link up academic and industrial counterparts to develop new approaches using artificial intelligence (AI) methodologies for customized management, to ensure products reliability and systems safety.

Our research focuses on

- Anomaly Detection and Syndromic Surveillances
- Innovative Diagnostics for Health Management
- Prognostics for Remaining Useful Life Assessment
- Safety Assurance: Improve Functional Safety
- Data Analytics Platform for Reliability

CAiRS focuses on fundamental and applied research. ReSaTech Limited, a CAiRS' affiliate being incorporated in Hong Kong, is dedicated to customization and deployment works.

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