



Golden Wealth  
TECHNOLOGY  
金 康 科 技

# Smart Airport Access Control and Runway Safety Technology with AI

July 2024

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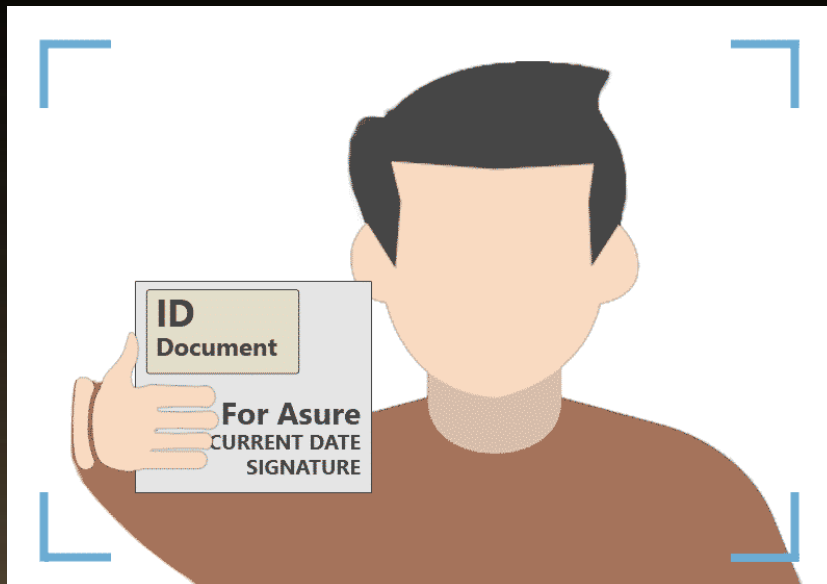
Golden Wealth Technology Limited



# Challenges of Current Access Control

## Pain Points:

- Manual Verification on person's identity
- Complication on Checking of Restricted zones and code matching
- Access expiration or wrong rostering

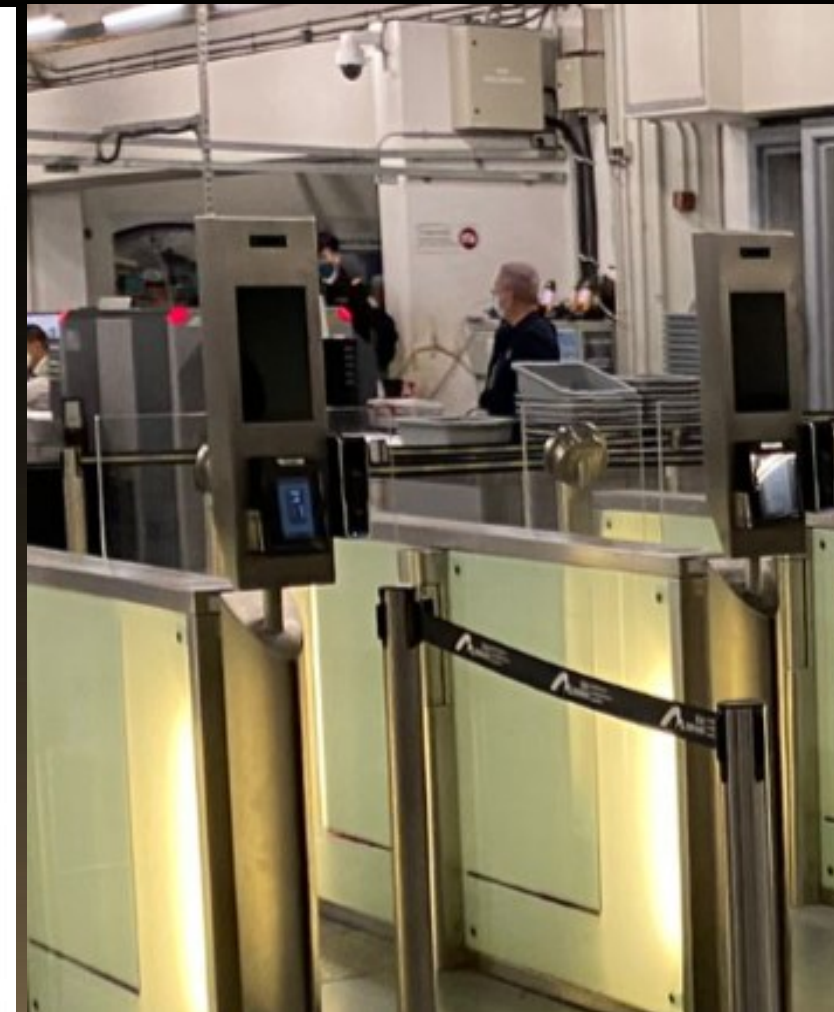
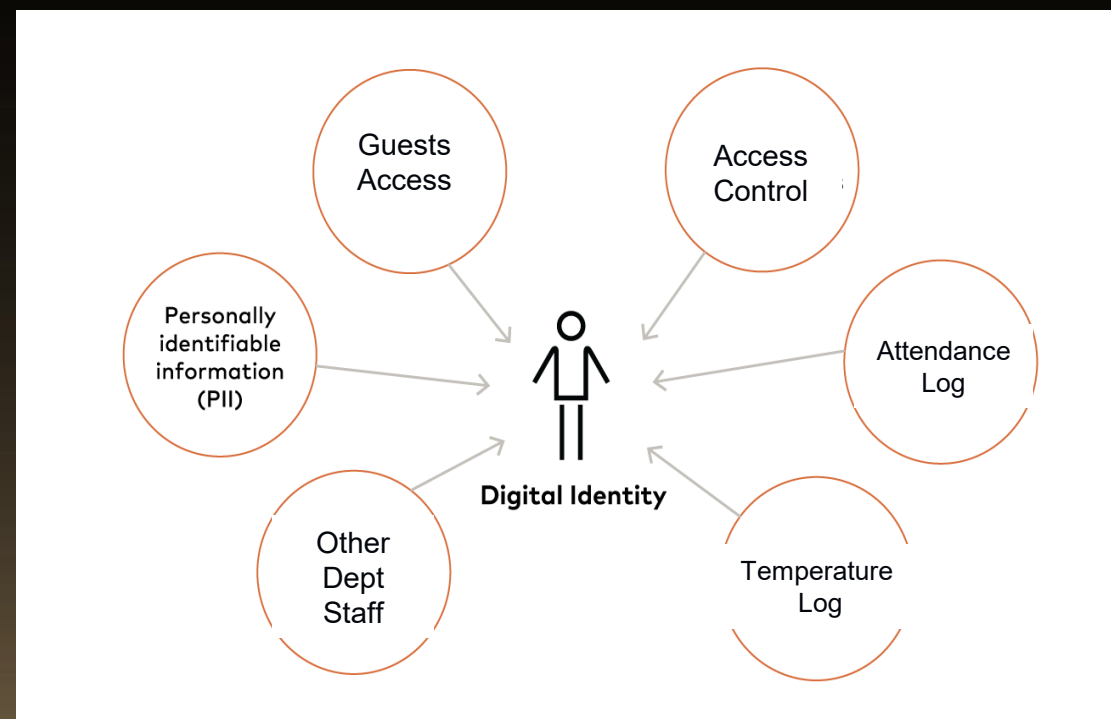




# AI Enhanced Access Control

## Digital Identity for Airport Staffs and Contractors:

- Facial Recognition (With Mask or Without Mask)
- Touchless Access Control (with temperature measurement)
- Checking Multiple Zones / Permit Authorization
- Blacklist / VIP / Visitors / Staff verification
- 



# World Leading Facial Recognition Algorithm in industry

## NIST FRVT RESULT SUMMARY [2022]



### 1:1 FR

SenseTime ranked **#1** in 4 tests out of 7, including

- Mugshot (FNMR=0.21%)
- Mugshot>12yrs (FNMR=0.2%)
- Visaborder (FNMR=0.21%)
- Border (FNMR=0.4%)



### 1:N FR

SenseTime ranked **#1** in 4 tests out of 8, including

- Mugshot – Mugshot (N=12M)
- Mugshot – Mugshot (N=1.6M)
- Mugshot – Webcam (N=1.6M)
- Visa – Border (N=1.6M)



### 1:1 FR W/ MASK

SenseTime ranked overall **#1** in this category.

- FNMR = 0.85%



### PAPERLESS TRAVEL

SenseTime ranked **#1** in 1 test out of 3.

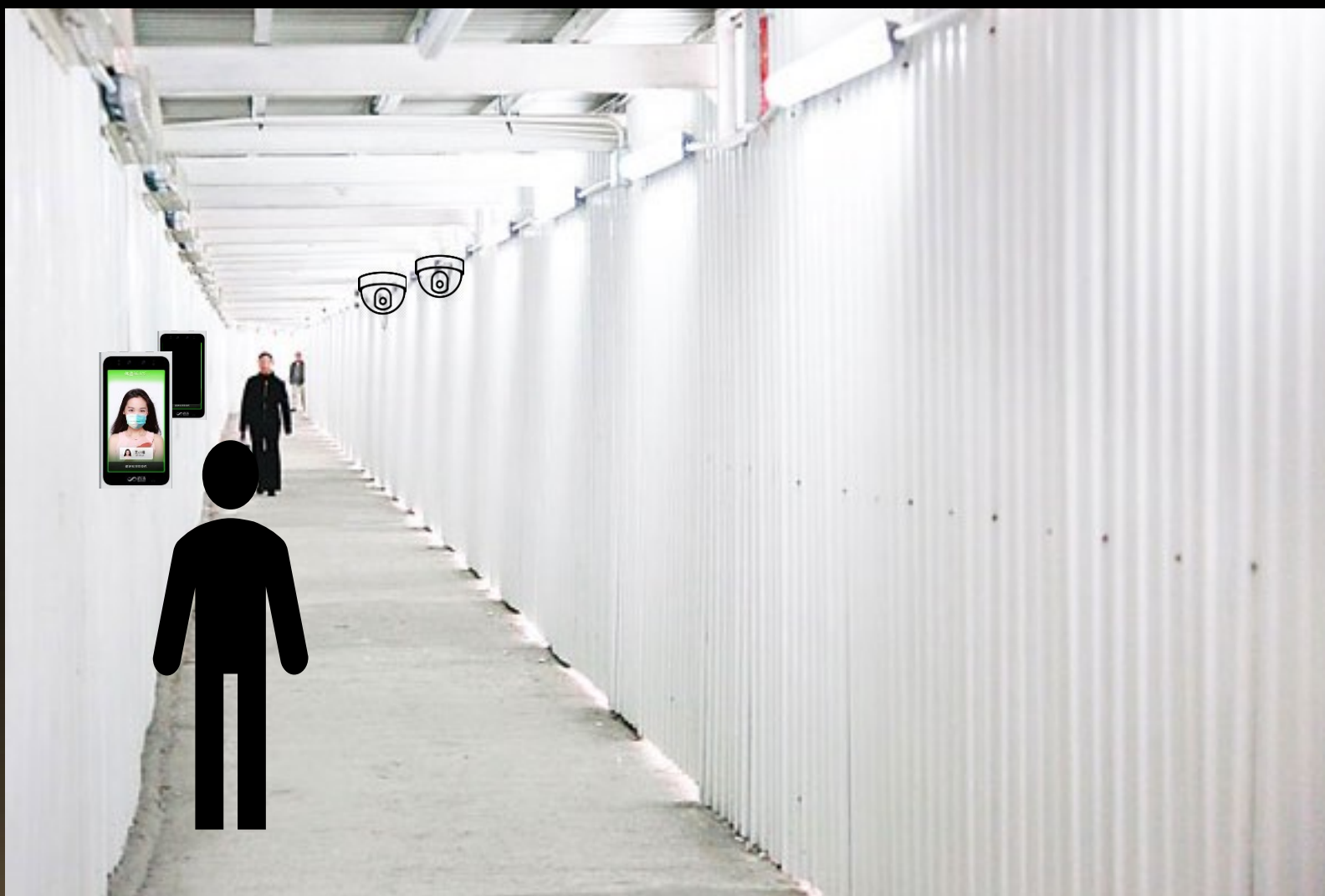
- FNIR=8% (N=420, K=1)

\* k value represents the number of image of each enrollee in each gallery.

- FNMR: False Non-Match Rates
- FNIR: False Negative Identification Rates
- These results are based on NIST FRVT report published in FEB, 2022. <https://www.nist.gov/programs-projects/face-recognition-vendor-test-frvt-ongoing>



# First in Asia Barrier Free Smart Access Control



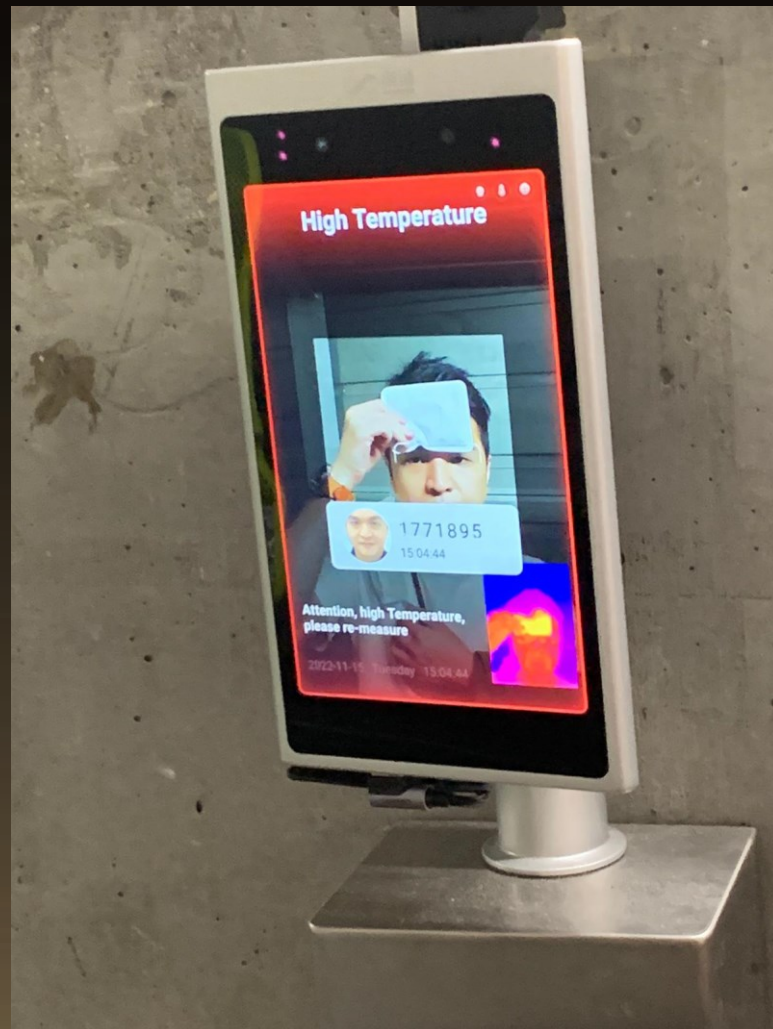
## Tier 1 FR Reader

- Person facial photos are imported into Control DB for Real-Time Watchlist Surveillance
- Contactless, fast screening, AI assisted
- Integrate with ACS, and if an unauthorized person or stranger is detected, alert within 1 second immediately.

## Tier 2 IP Camera

- FR Panel rejects entry of unauthorized personnel or personnel without scanning the FR Panel. The second layer of protection will pass through IP camera capture and recording.

# First in Asia Barrier Free Smart Access Control

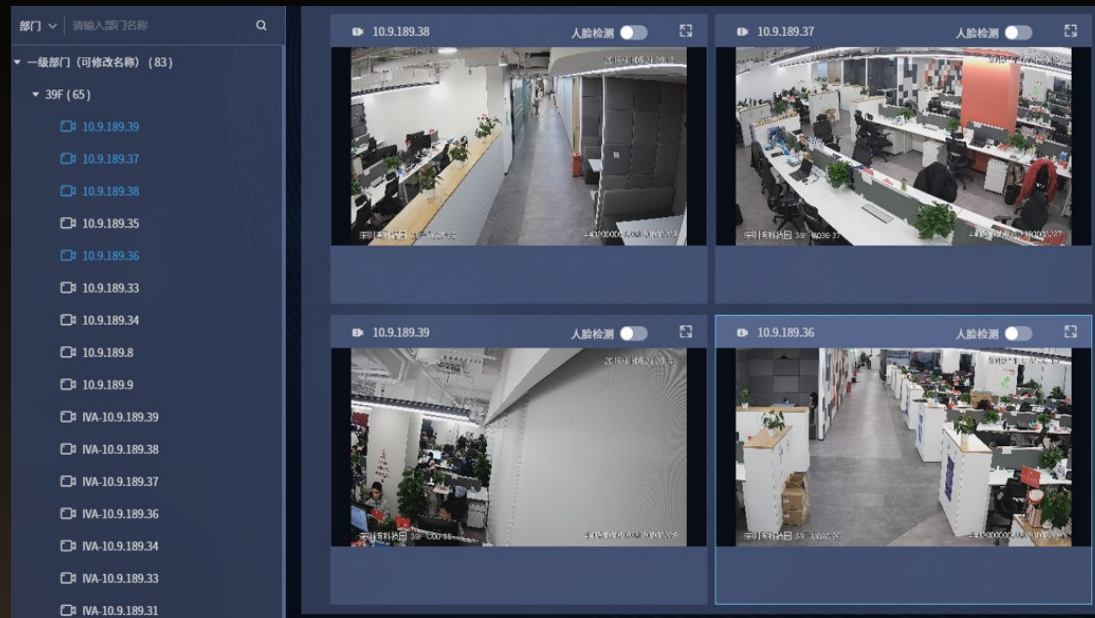




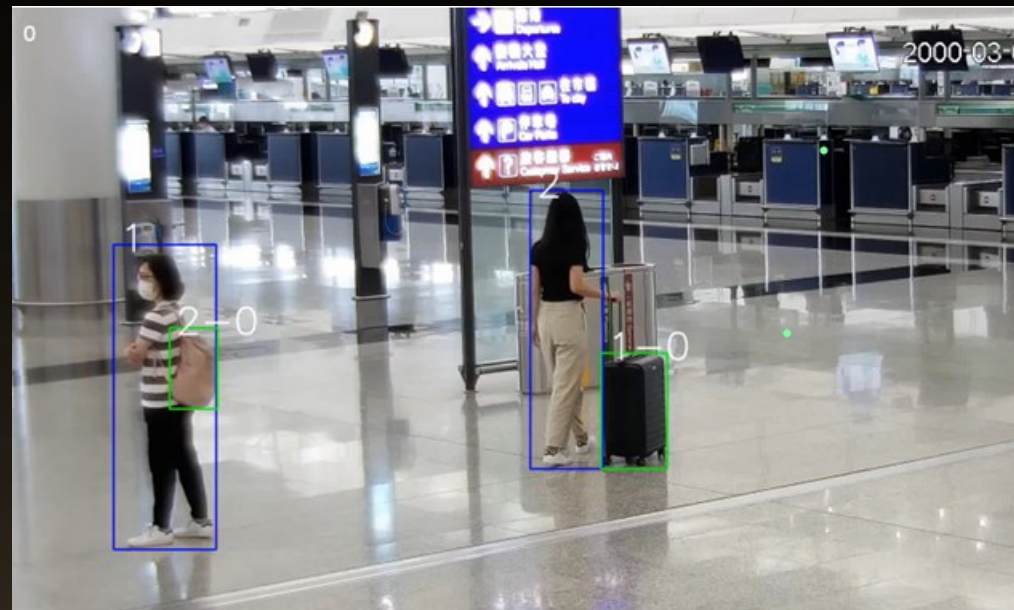
# AI Enhanced Airport Safety

## Seemless integration with CCTV for identifying Missing Luggage / Person

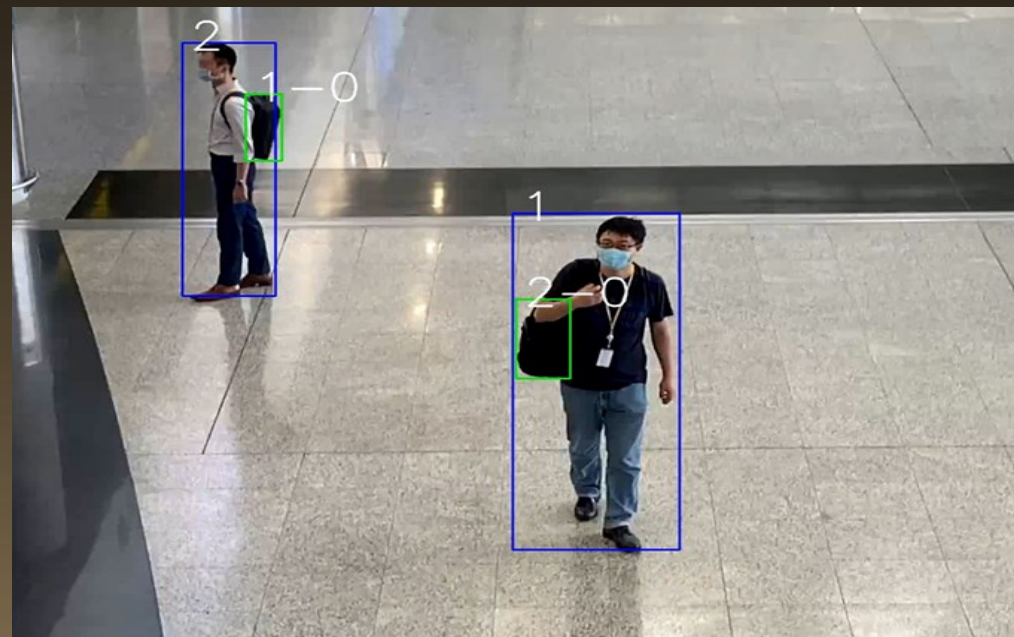
Levering Existing CCTV Cameras



Abandon Bags / Missing Luggage



Missing Person, Elderly





# Runway Safety with FOD

On June 17, 2024, at the Hong Kong International Airport's southern runway, where suspected foreign debris caused the runway to be closed, resulting in many arriving flights being forced to circle in the air and wait for around an hour. Additionally, departing flights were also affected and had to wait either for arriving flights to land or during a gap in the schedule before taking off.

Source:

[https://www.hk01.com/article/1029422?utm\\_source=01articlecopy&utm\\_medium=referral](https://www.hk01.com/article/1029422?utm_source=01articlecopy&utm_medium=referral)

## 機場南跑道疑有外來碎片關閉 多班航機盤旋

撰文：凌逸德

出版：2024-06-17 06:09 更新：2024-06-17 07:35



赤鱸角機場南跑道，凌晨懷疑發現外來碎片，須緊急關閉，據悉事發時機場僅單跑道運作，多班抵港航班須在空中盤旋等候，其中最等候時間最長

在北  
趁空





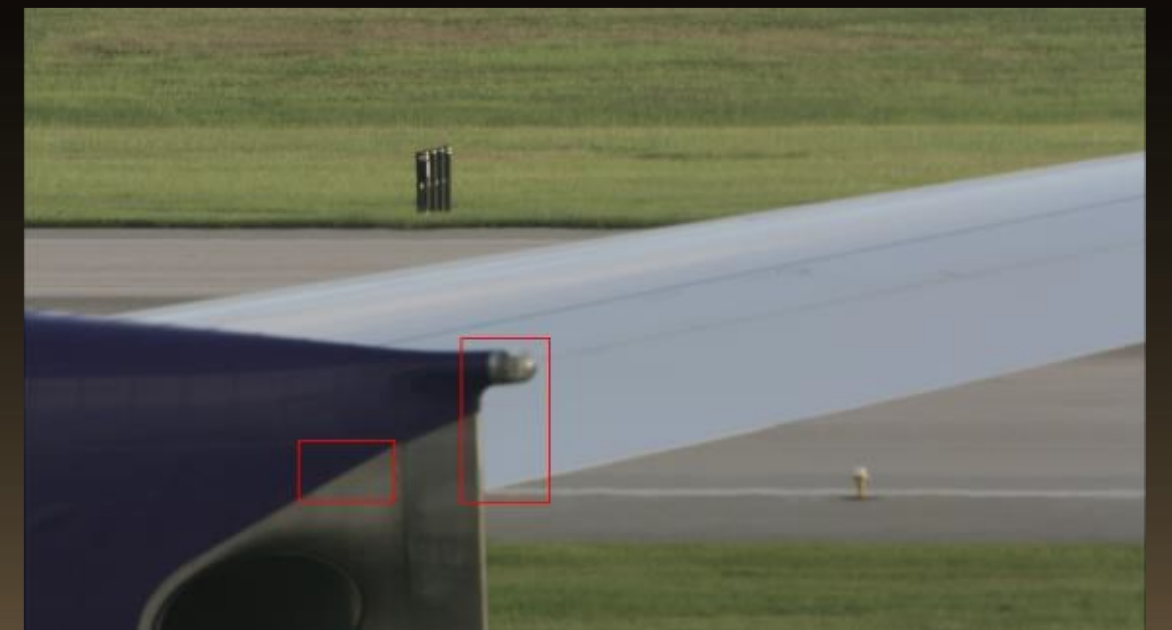
# Challenges of Existing FOD System

Conventional FOD System relies on Camera or Thermal Images, decision support relies on experienced engineers or crew staff to determine True FOD by manual checking

## Pain Points:

Among 2 Asian Airports using FOD System

- Accuracy on FOD Alerts from Environmental Factors (60+ daily alerts)
- No AI Continuous Learning (Repeat false alerts on same pattern)
- Huge Investment





# Our Solution

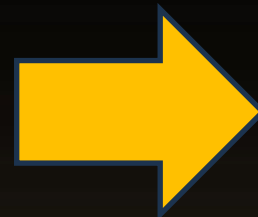
## Powered by World Leading AI Technology



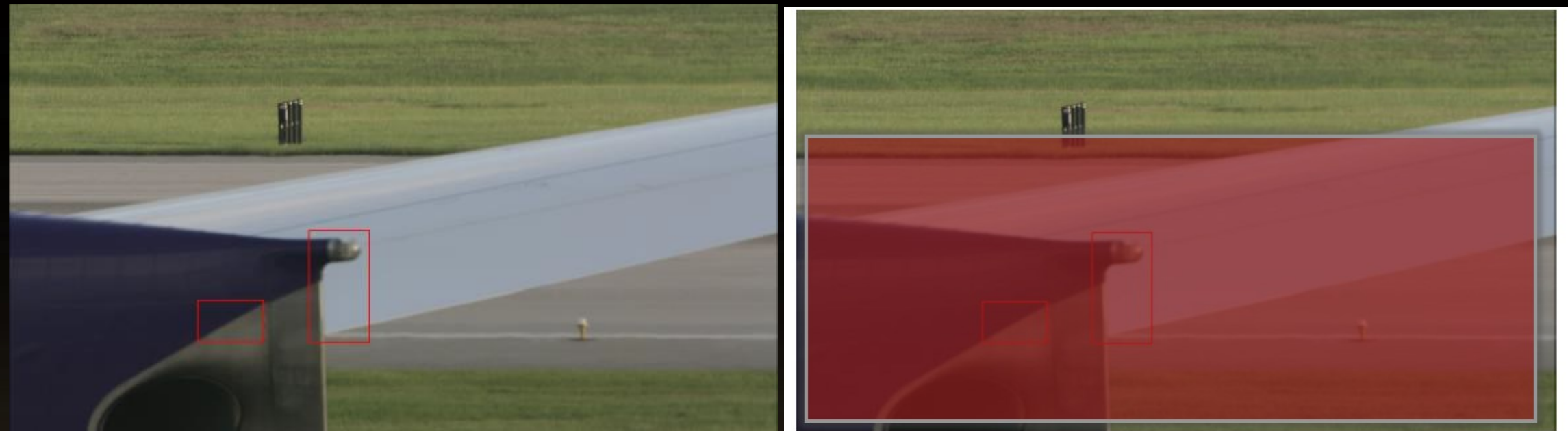
**AI Technology on Facial Recognition by NIST ranked #1 in 4 tests out of 8**, including

- Mugshot – Mugshot (N=12M)
- Mugshot – Mugshot (N=1.6M)
- Mugshot – Webcam (N=1.6M)
- Visa – Border (N=1.6M)

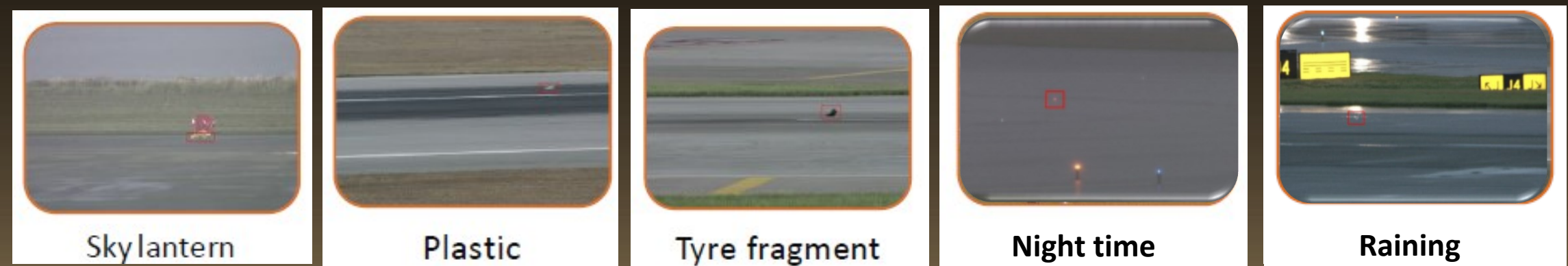
Four Consecutive years in the role by NIST as of 2022



Object Filtering Technology



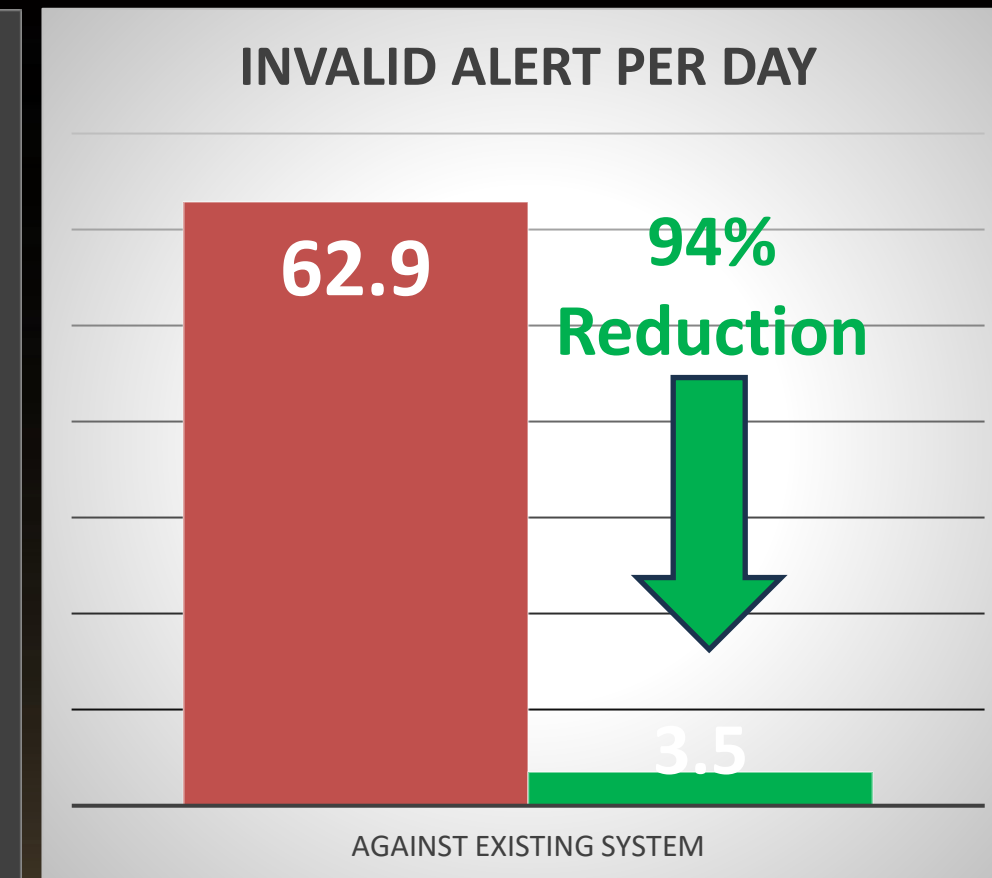
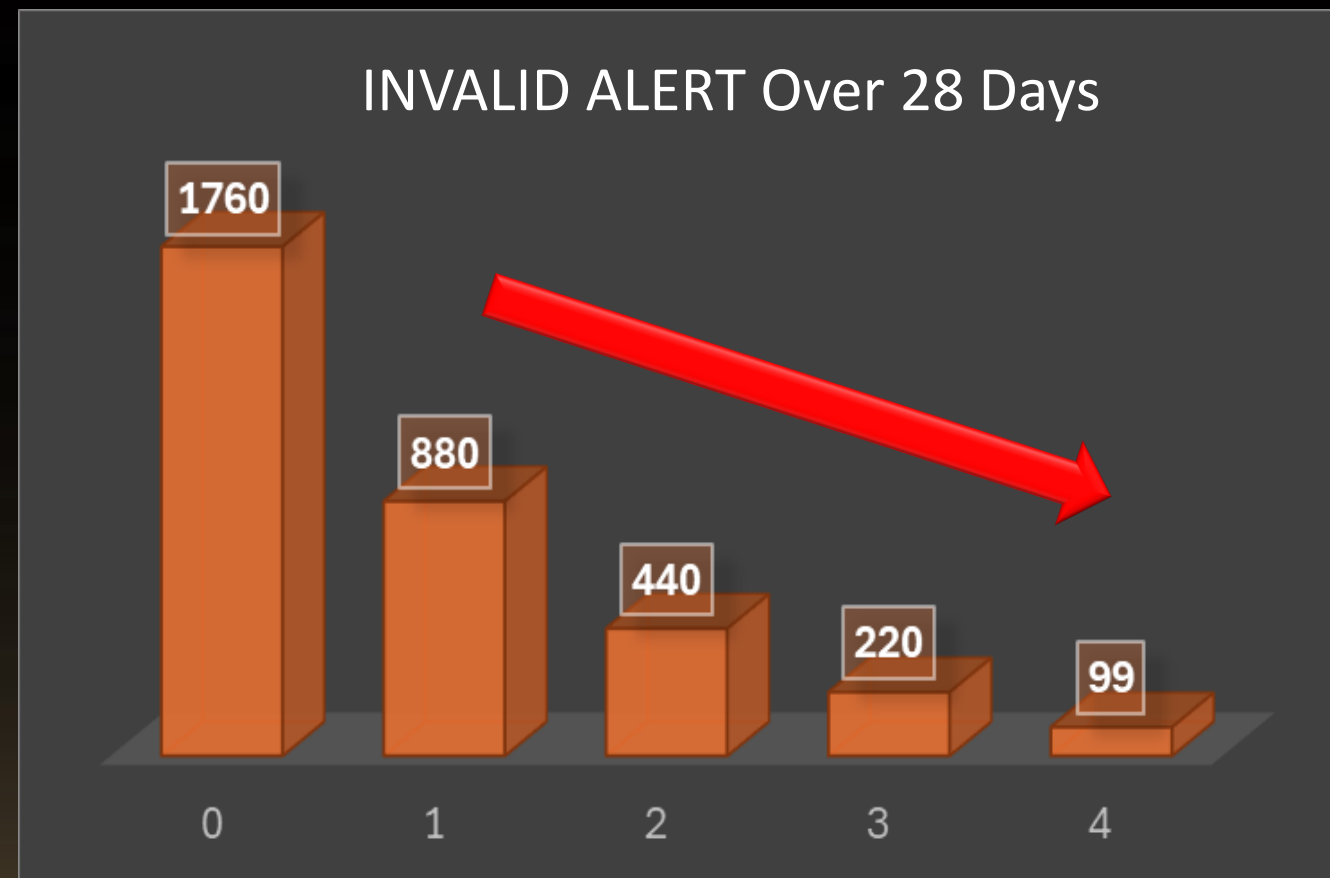
Objects Identification and different Environment





# Runway Real Data for 28 days (6/10 to 3/11/ 2023) On-Site Improvement Against Existing FOD System

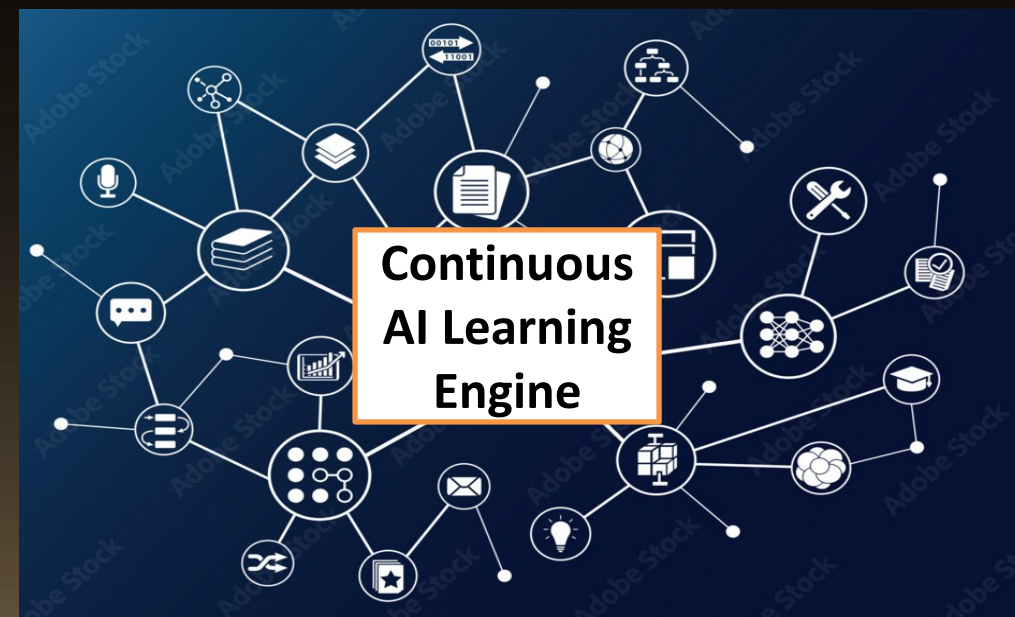
- **Existing System at 1 of 2 Asian Airports**
  - Existing System fired **1,760** invalid alerts in 28 days
  - Average **62.9** alert / day
- **Our FOD System with AI Technology**
  - **94%** reduced or only **99** alerts in 28 days.
  - **3.5** invalid alert / day / sensor
  - AI model can be trained and continuous improved





# Continuous AI Learning and Knowledge Retention

- Seamlessly capture data through Operation
  - Enhancement Environmental Training Data
  - Utilize for Optimizing Model Training
- Acquire Unspeakable Knowledge
  - Retain Staff's Expertise
  - Mitigate Impact of Staff Movement
  - Uphold Business Continuity
- Training & Education by AI
  - Staff Training
  - Aviation Education



## Engineers' Experience

# Overcome Complicated Environment

## AI Learning can perform under Partial Maintenance



Conventional System



AI FOD System (Day Time)



AI FOD System (Night time)

**Precisely Recognize FOD objects**

**Precisely Recognize FOD objects  
and Filtered Background Objects  
and AGL Lights**



# Scalable Architecture with AI Enabled FOD Solution

**One** FOD AI Engine  
serves  
**Multiple Runway**

**Can Pair Existing**  
FOD Video Sources





Lead Forward 引領未來

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Smart Airport

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Artificial Intelligence

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Innovation