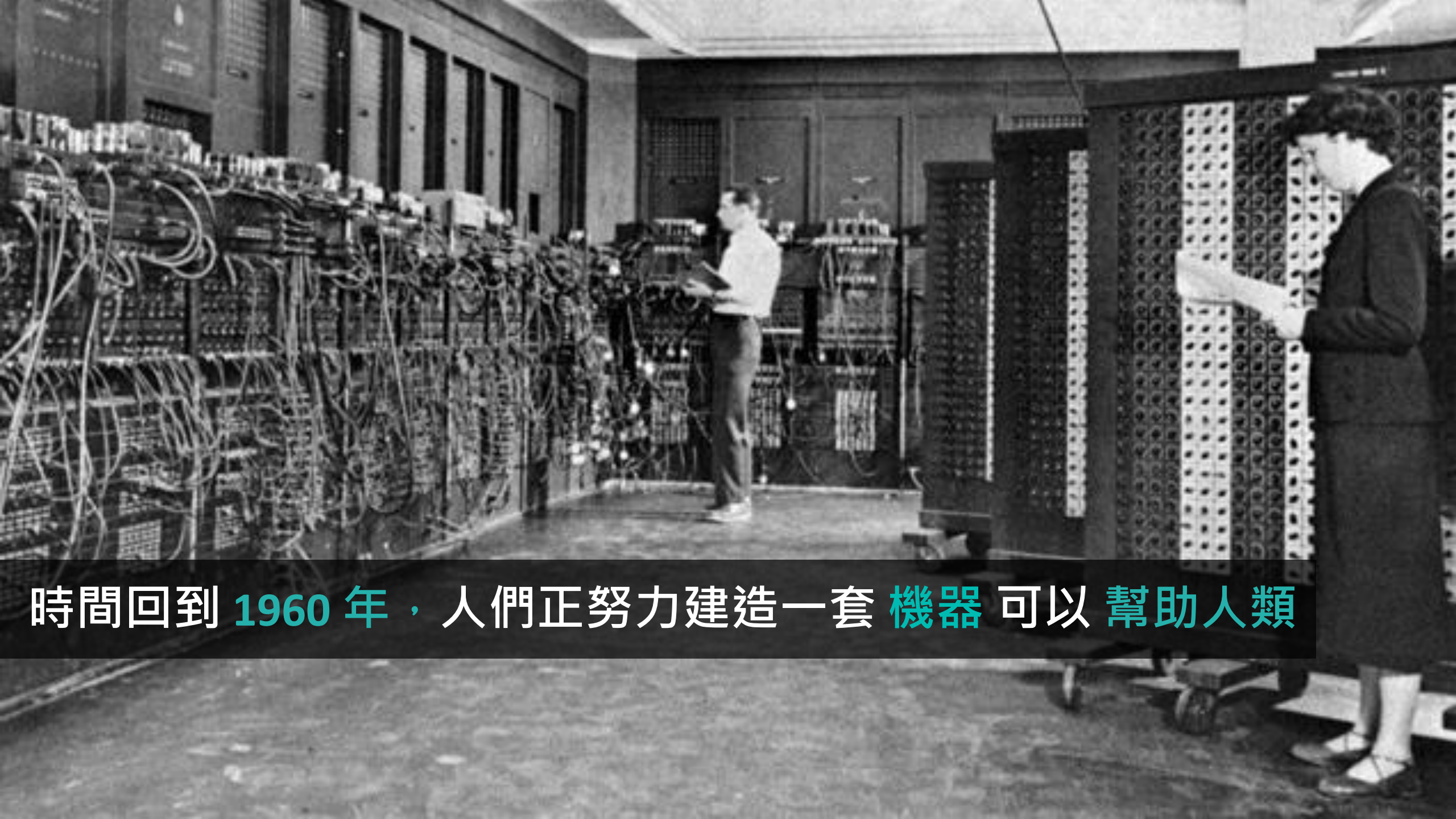
如何以 OpenVINO 實現一半成本與快速普及的 AI 產品

以 智慧城市 的 監控影像 為例

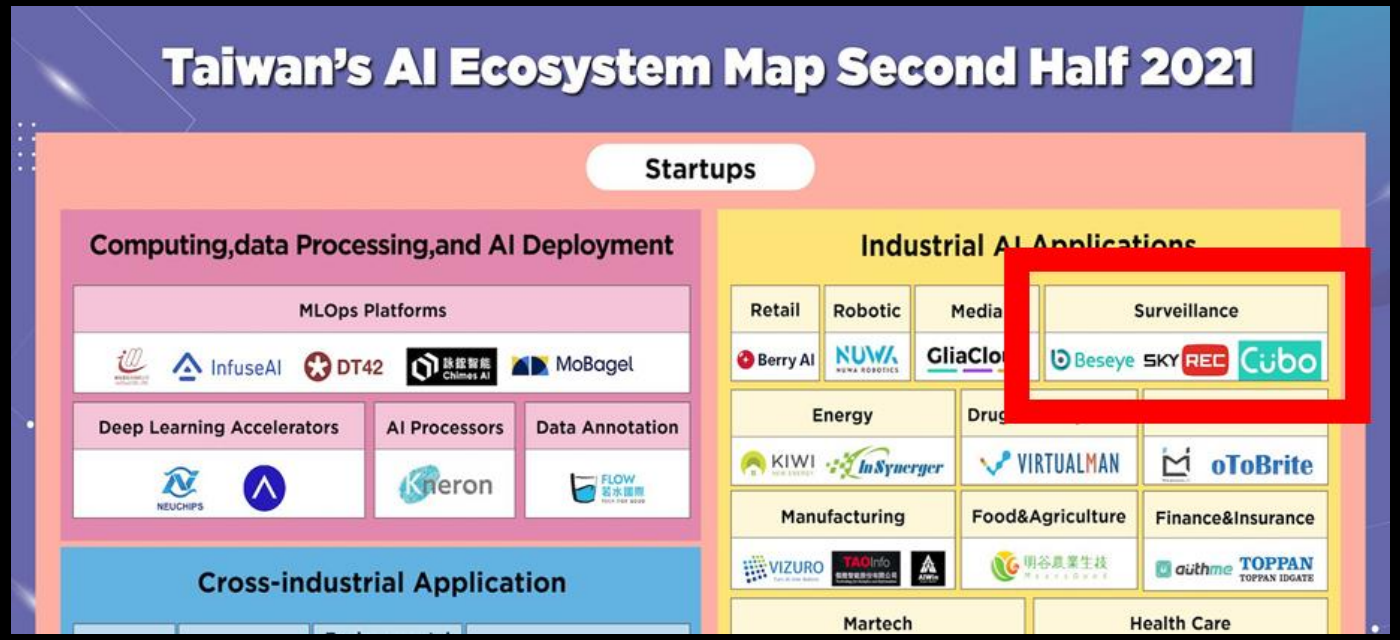
CEO

Shaq Tu

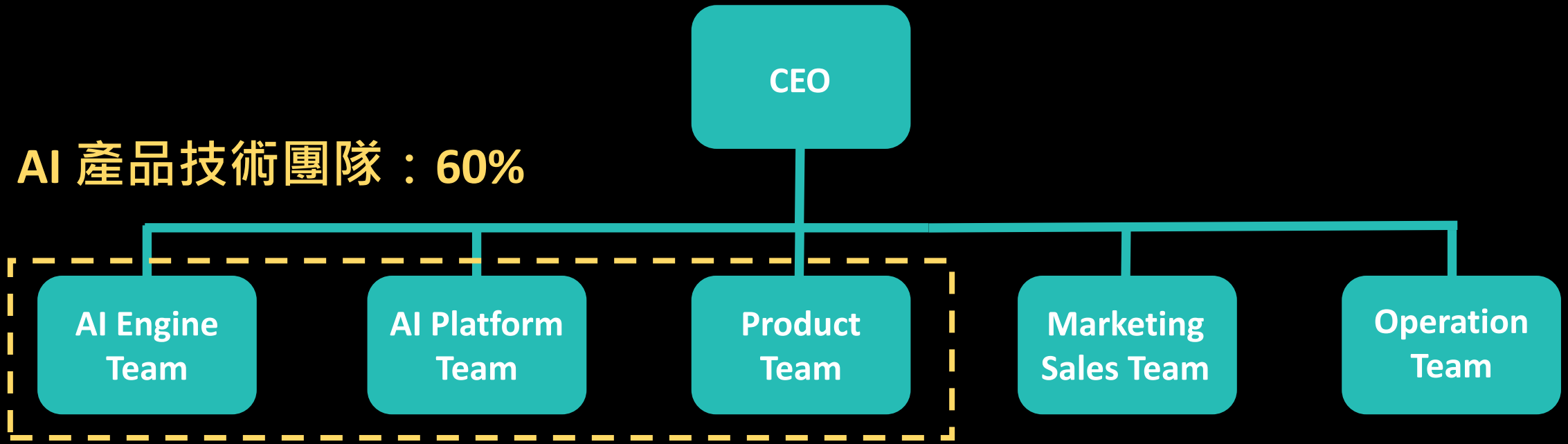

時間回到 1960 年，人們正努力建造一套 機器 可以 幫助人類

Beseye

- 成立：2013
- 資本額：2.4億 (NTD)
- 台灣 TOP-3 安全攝影機領域人工智慧影像軟體公司



AI 產品技術團隊：60%



Our Global Service Map

JFE スチール 株式会社 AUO 台灣中油 東急電鉄 KINTETSU NTT NEC 中華電信 Chunghwa Telecom FAR EASTONE 遠傳 ADVANTECH National Kaohsiung Center for the Arts WEI WU YING 衛武營 國家藝術文化中心 松山文創園區

How Many Camera are There in Taiwan?

Worldwide

TOP-3

Security Camera Density

Skeleton-Print™ Analysis

- Privacy Issue-Free
- Longer Detection Range
- Less Camera Angle Limitation

Our AI Skeleton-Print™ Engine

Skeleton Analysis

User Group Analysis

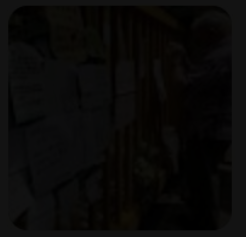
Location Analysis

Relationships Between Smart City and Vision AI

社會 - 中時新聞網

社會9點檔》侵入校園割頸殺女童 幻覺犯案逃死惹眾怒

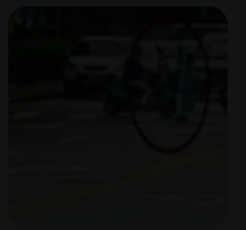
2015年5月29日下午16點20分，龔翻越北投某國小圍牆，到4樓6年1班旁的廁所，等待10分鐘後看見落單女童，持菜刀朝8歲女童頸部橫割1刀，深度達10公分，...



Yahoo奇摩新聞

「160cm體型瘦小」 35歲男穿校服闖國小偷拍

兩個小孩都讀這裡，家長當然很不放心，畢竟七年前的北投文化國小，發生8歲女童割喉案，當時龔姓嫌犯從後門翻牆進去用水果刀行兇，事後校方為了防堵也裝這...



Yahoo奇摩新聞

校園沒開放！男翻牆闖入 不滿遭驅趕竟亮刀

校園沒開放！男翻牆闖入不滿遭驅趕竟亮刀 ... 1日下午四點多，花蓮一名吳姓男子翻牆闖入北埔路上的一所國中，正好被施工工人看見，告知他學校沒開放，他竟然...

自由時報

驚！通緝犯躲警察闖進國小 躲廁所被逮

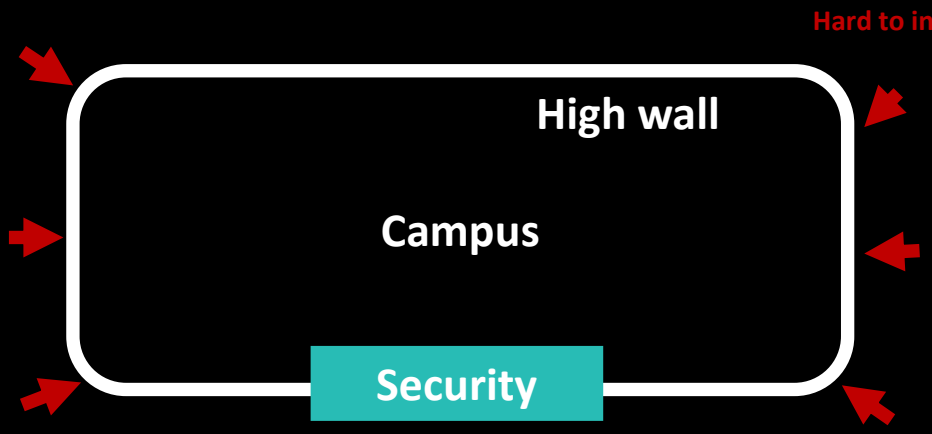
... 於此次事件中，師生演練一次急應變程序，但校園畢竟是重要的安全空間，經檢討評估後，未來中午放學時間將不會開啟大門，降低遭陌生人闖入機會。

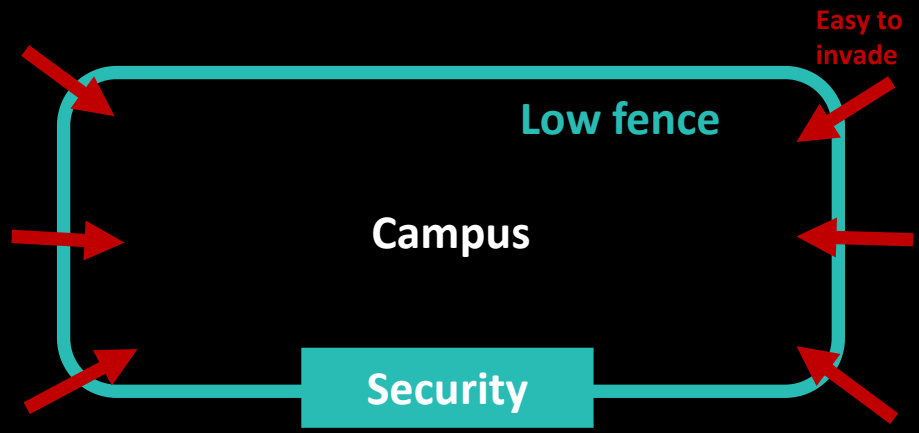
The Rise of Green Fence

Safety Fences at Campus

Past

Now

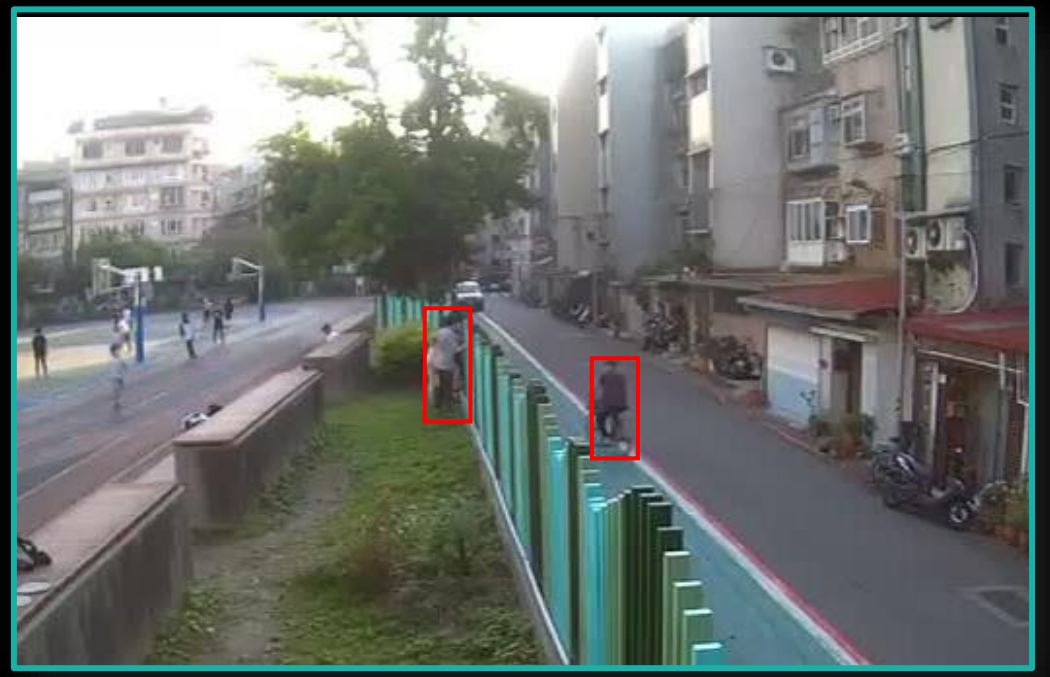




Existing Solutions

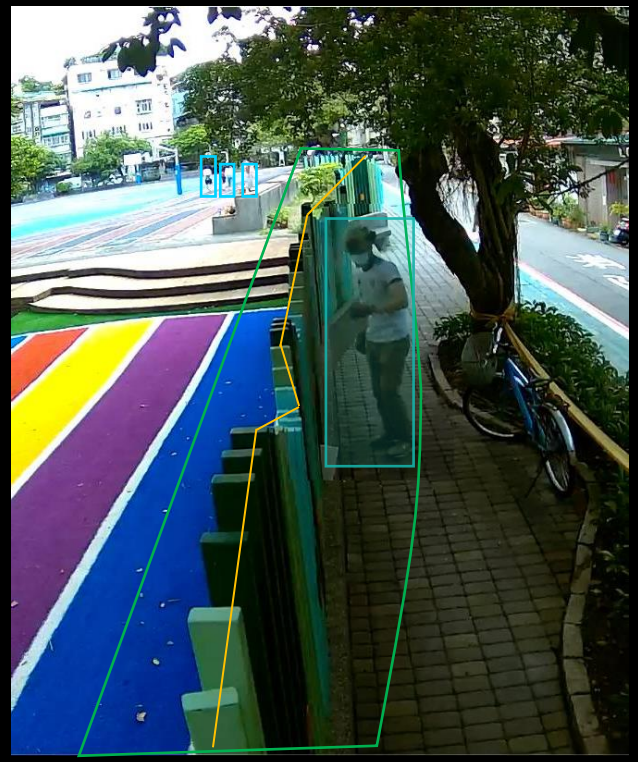
1st -Generation : Infrared

2nd-Generation : Humanoid Detection



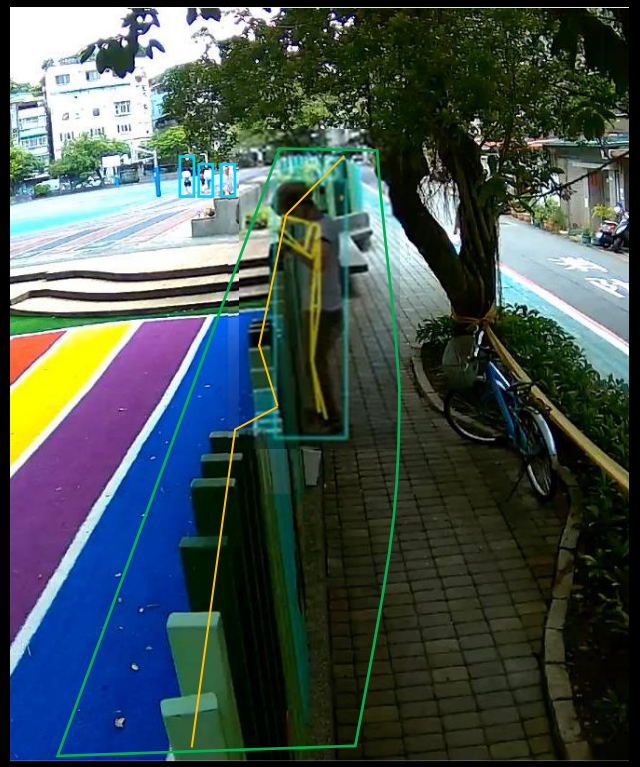
False Alarm

3rd Generation : AI Can Understand Climbing Posture



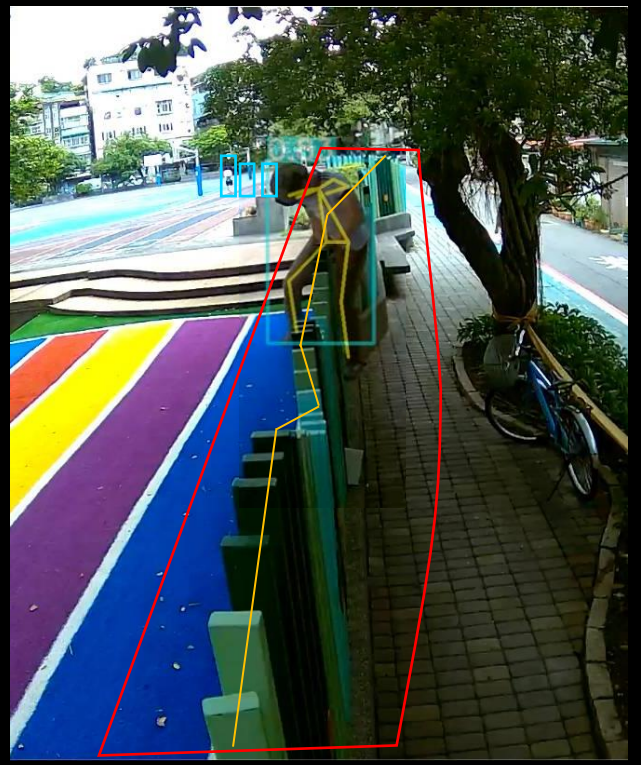
STEP.1

Human Passing



STEP.2

Human Pose Analysis



STEP.3

Confirm Climbing

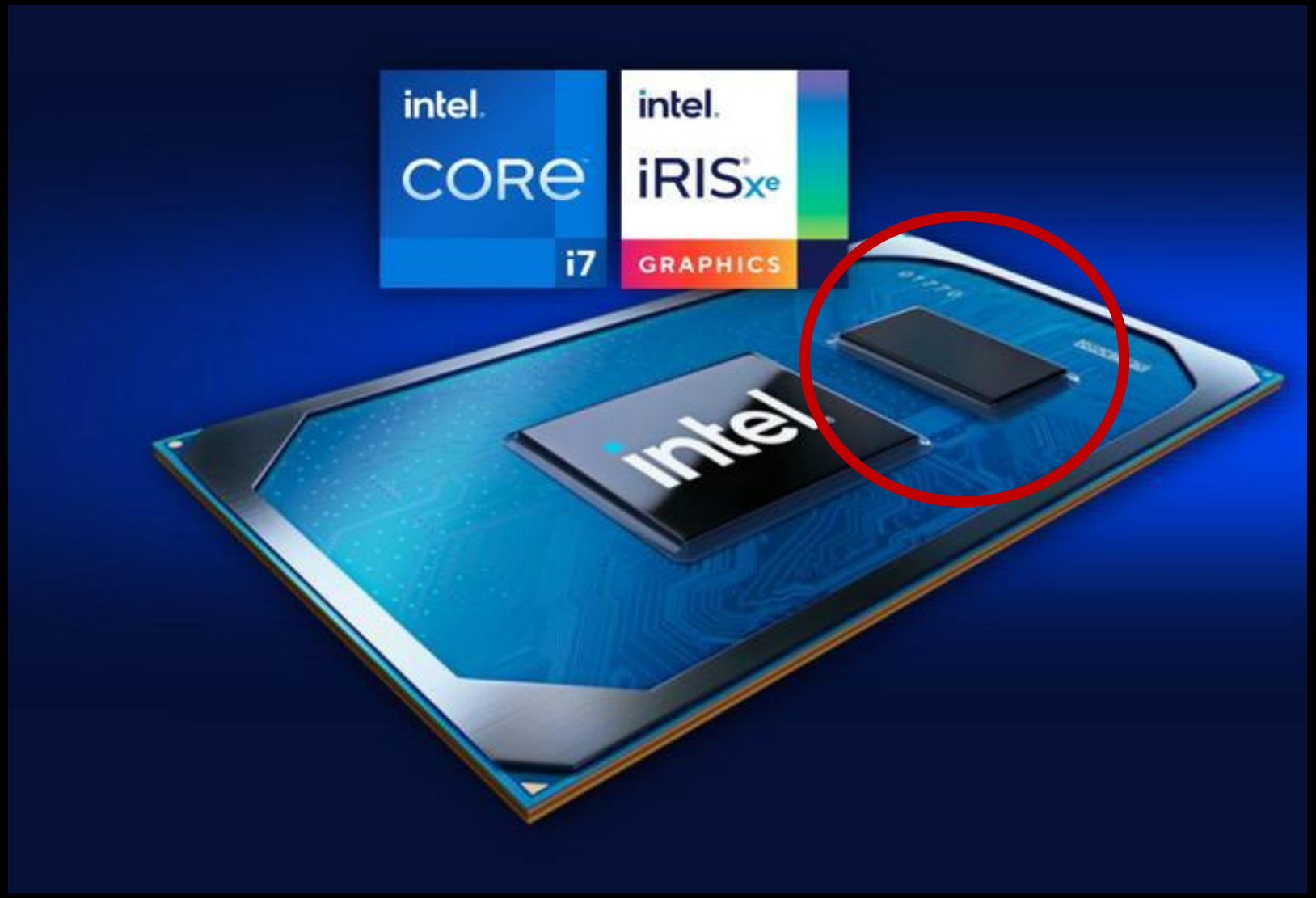
How to Make AI
More Popular

Anything Like This
Preventing AI from Getting Popular

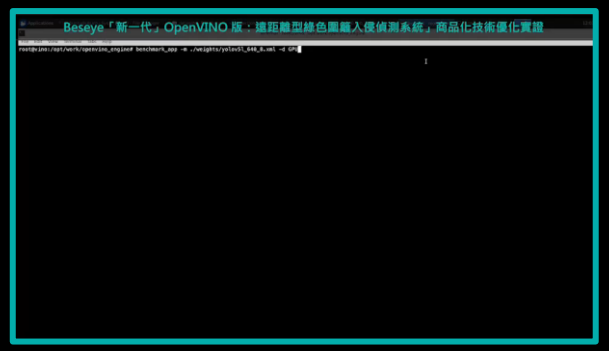
Traditional AI Server
(CPU w/ Discrete GPU)

80 ~ 200K NTD

4X Performance Boost in Oct. 2020



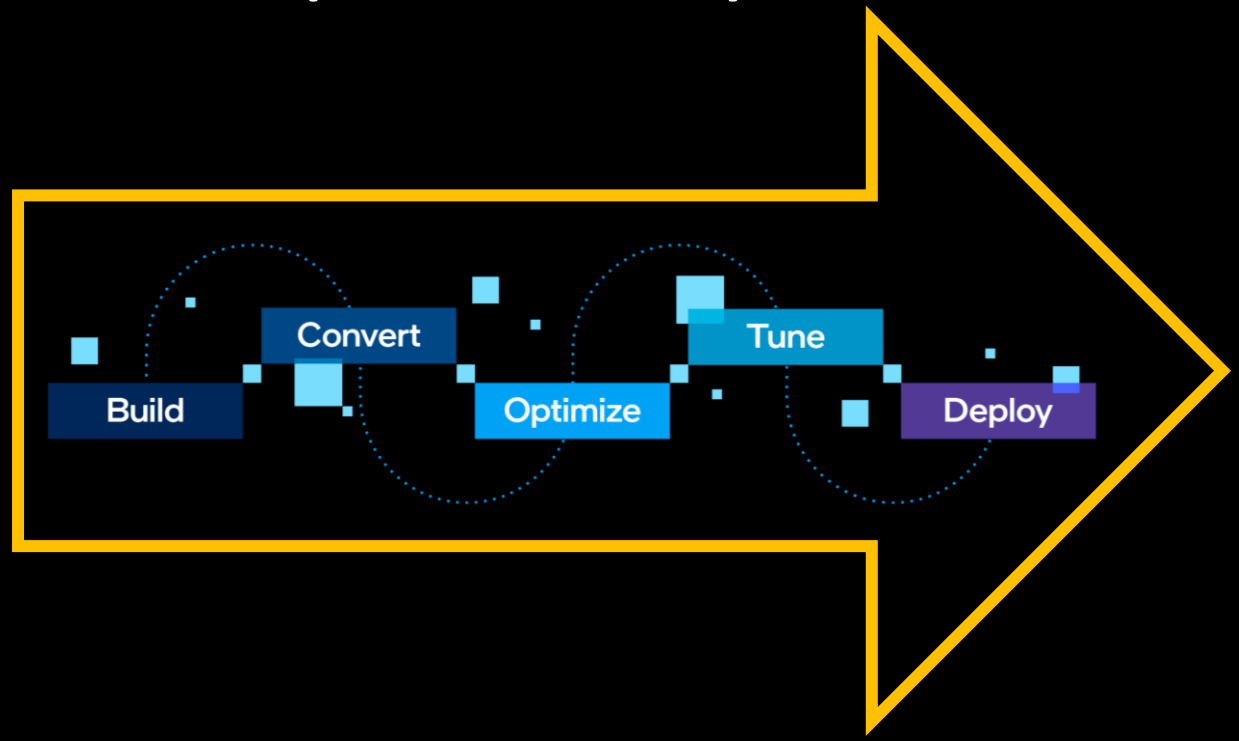
Squeeze out 3X of Intel CPU's Performance

Gen-3	Gen-3.1	Gen-3.2	Gen-3.3
			
	Speed Up 126%	Speed Up 176%	Speed Up 299%

12x Boost

(299% x 400%)

Skeleton-Print™



Skeleton-Print™

× OpenVINO™

intel. CORE

3rd Generation : School's Real Case in Taipei

After 12X Boost, AI Becomes…

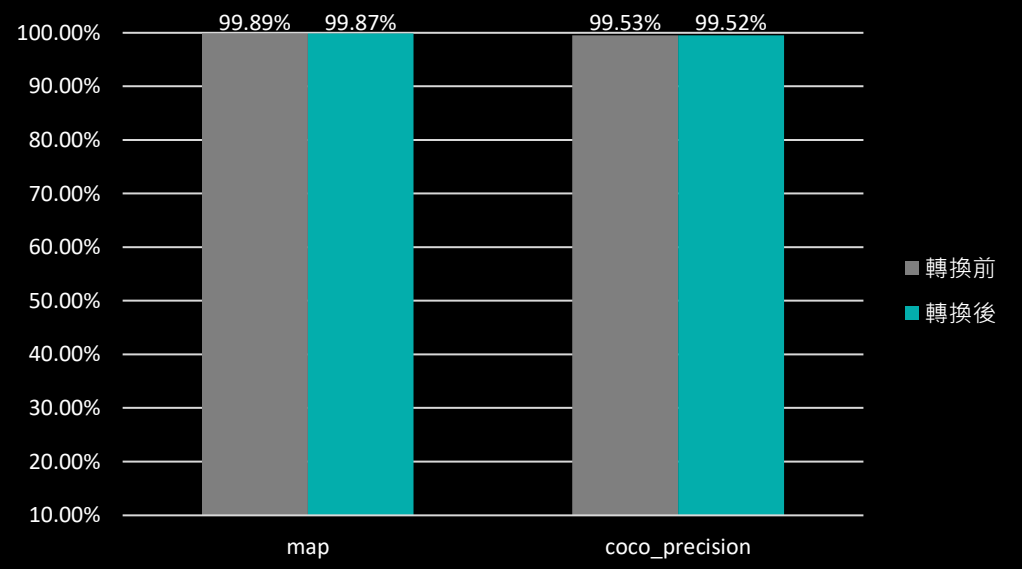
Traditional AI Server $80 ~ 200K

OpenVINO™ AI Edge Platform $30~60K

CPU w/ Discrete GPU

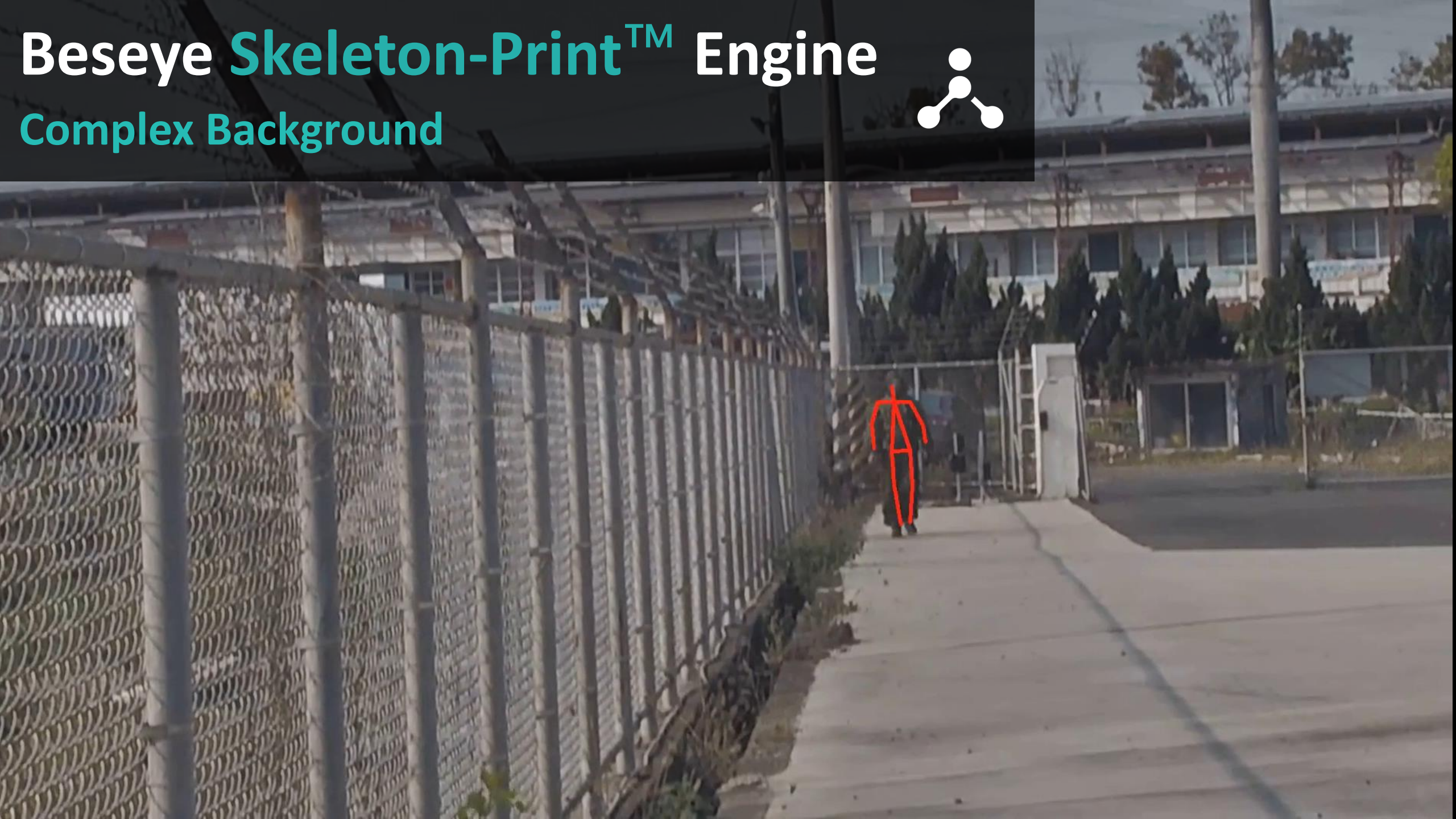
Accuracy support

- OpenVINO™ Accuracy Checker



Beseye Skeleton-Print™ Engine

Complex Background



Beseye Skeleton-Print™ Engine

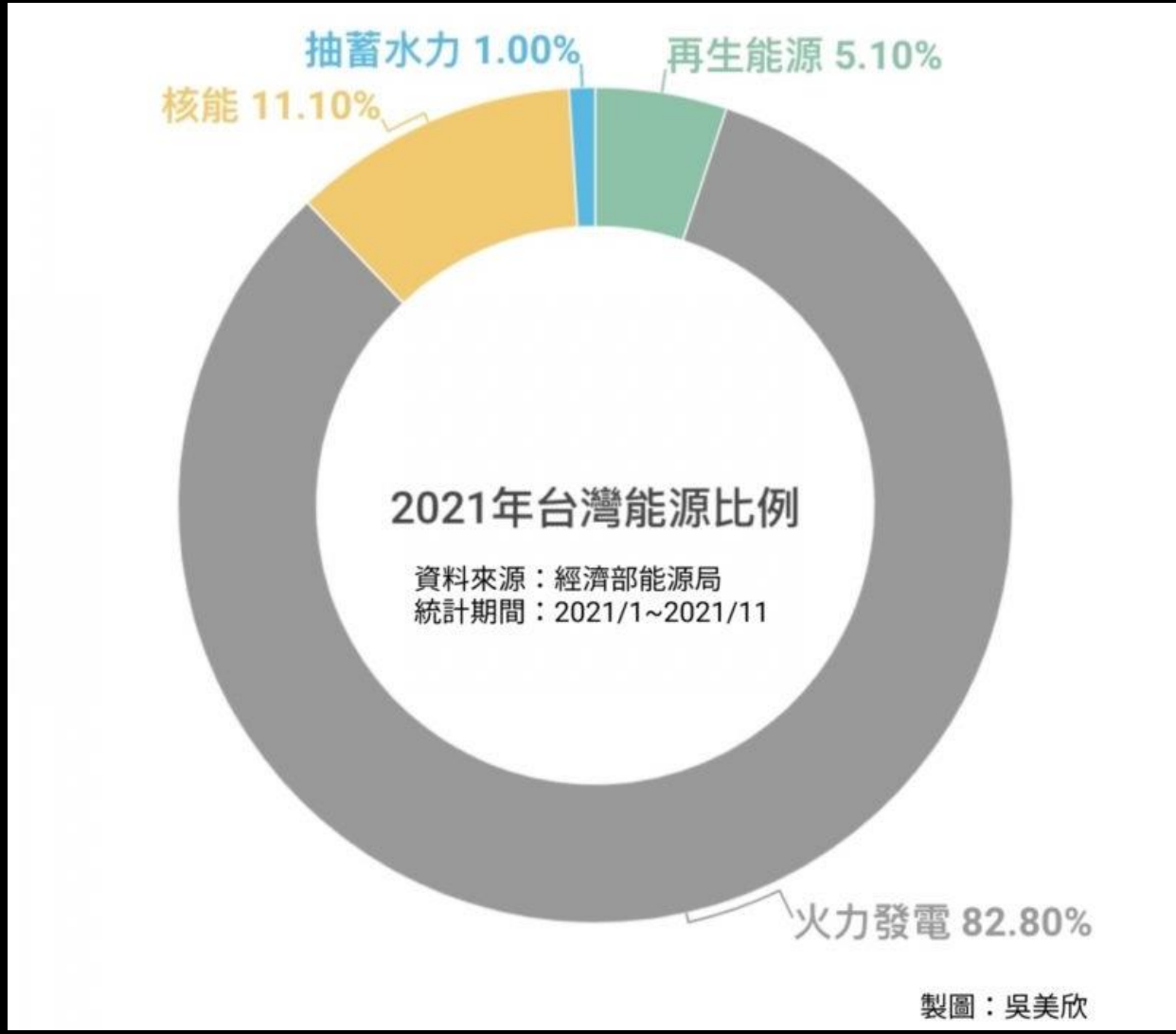
Totally Darkness

Relationships Between Smart City and Vision AI

Cities Contributes

- **75%** of **Energy Consumption**
- **70%** of **Carbon Emission**

Most of Our Energy Still Came From Gray Power



Ref: https://finance.technews.tw/2022/01/02/taiwans-first-green-electricity-subscription-platform/

Relationships Between Smart City's De-Carbonization and Vision AI

2023/01/07 11:49

Bus Stop AI System in Smart City

LOC.: Bus Stop #1724
ABNORMALITY: Passenger Waiting

2023/01/09 20:16

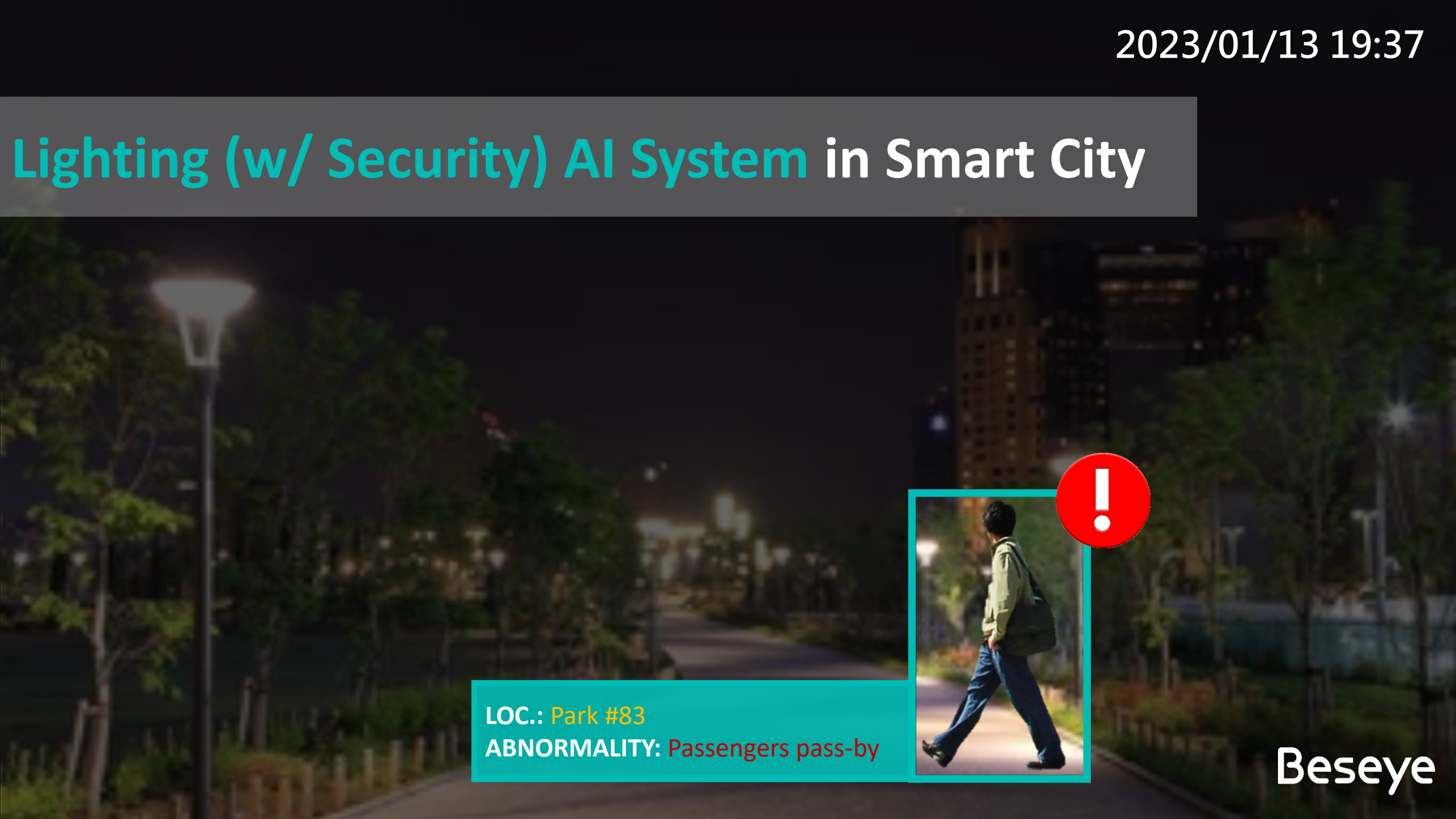
LOC.: Room#611, Building #2
ABNORMALITY: Someone Work Overtime

Building Cooling/Heating AI System in Smart City

Beseye

2023/01/13 19:37

Lighting (w/ Security) AI System in Smart City



LOC.: Park #83
ABNORMALITY: Passengers pass-by

Beseye

2023/02/10 15:37

LOC.: Highway#1, 13KM
ABNORMALITY: Passengers get off the car

Super-Highway Car Accident AI System in Smart City

Beseye

Relationships Between De-Carbonization Sources (Green Energy) and Beseye AI

2023/02/08 12:16

Security AI System in Solar Power

LOC.: Solar Power Plant #17
ABNORMALITY: Invasion

Beseye

2023/02/11 13:03

Patrol Inspection AI System in Solar Plant

LOC.: Solar Power Plant #15
ABNORMALITY: Not follow patrol routes

Beseye

2023/02/12 16:19

Patrol Inspection AI System in Energy Storage

LOC.: Energy Storage Plant #7
ABNORMALITY: Not follow patrol routes

Beseye

2023/02/18 13: 56

Usage Time AI System in Charging Station

LOC.: Charging Station #461
ABNORMALITY: Stay Time too Long

Beseye

No Ability to Analyze
User's Identity

Important for Smart City

The AI System Behind

Our Solution: Overview

Public Transit

Retail

Factories

Hospitals

...

Surveillance Cams

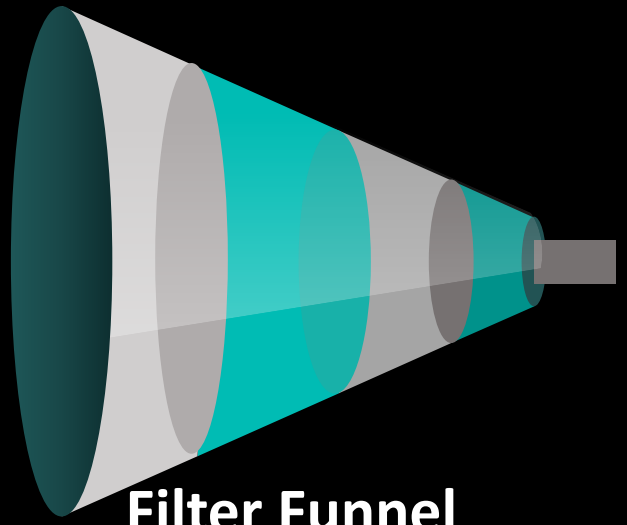
Max 8-10 cams monitored per person

Human
Manual Security Monitoring

Only 1 person required to respond to anomaly

Human
Problem Solving

4.18M surveillance cams in Taiwan Solely



Filter Funnel

Probability of occurrence less than 1%

Beseye

Our Solution: Overview

Public Transit

Retail

Factories

Hospitals

...

Unfortunately, it's NOT the REALITY

Surveillance Cams

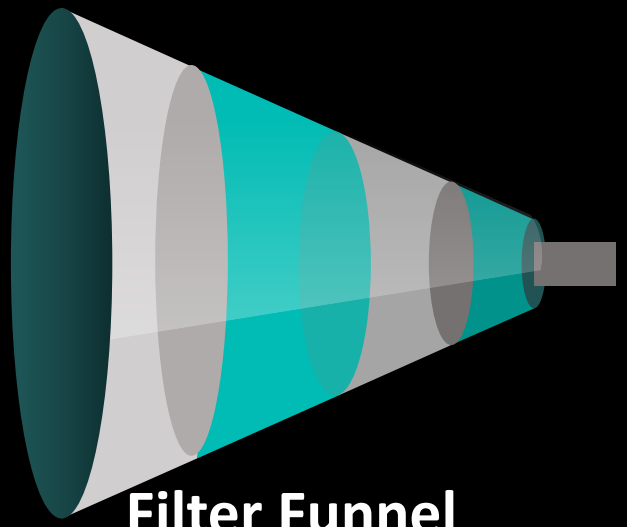
~~Max 8-10 cams monitored per person~~

Other AI Video Platform
Automated Security Monitoring

Only 1 person required to respond to anomaly

Human
Problem Solving

4.18M surveillance cams in Taiwan Solely



Filter Funnel

Probability of occurrence less than 1%

Beseye

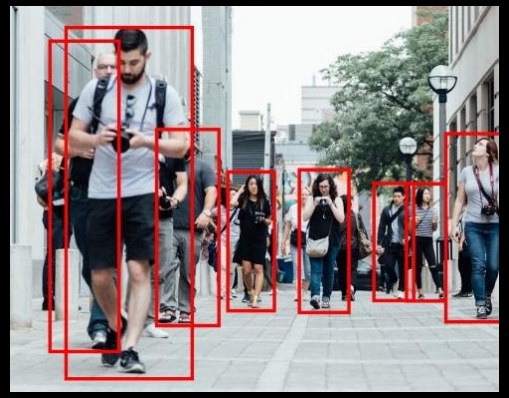
Why Existing Solutions are INSUFFICIENT?

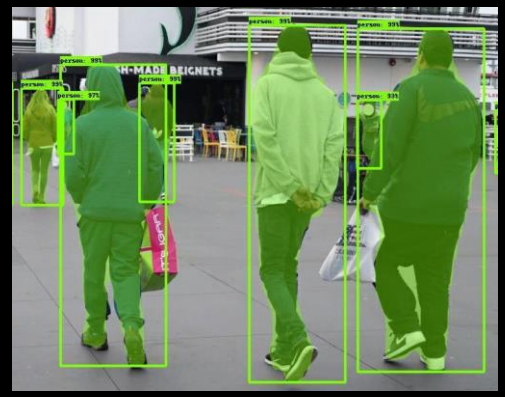
- Public Transit
- Retail
- Factories
- Hospitals
- etc.

→ **Surveillance Cameras** → **Other AI Video Platform**
Automated Security Monitoring → **Human**
Problem Solving

Existing Solutions

Literal AI Human Detection



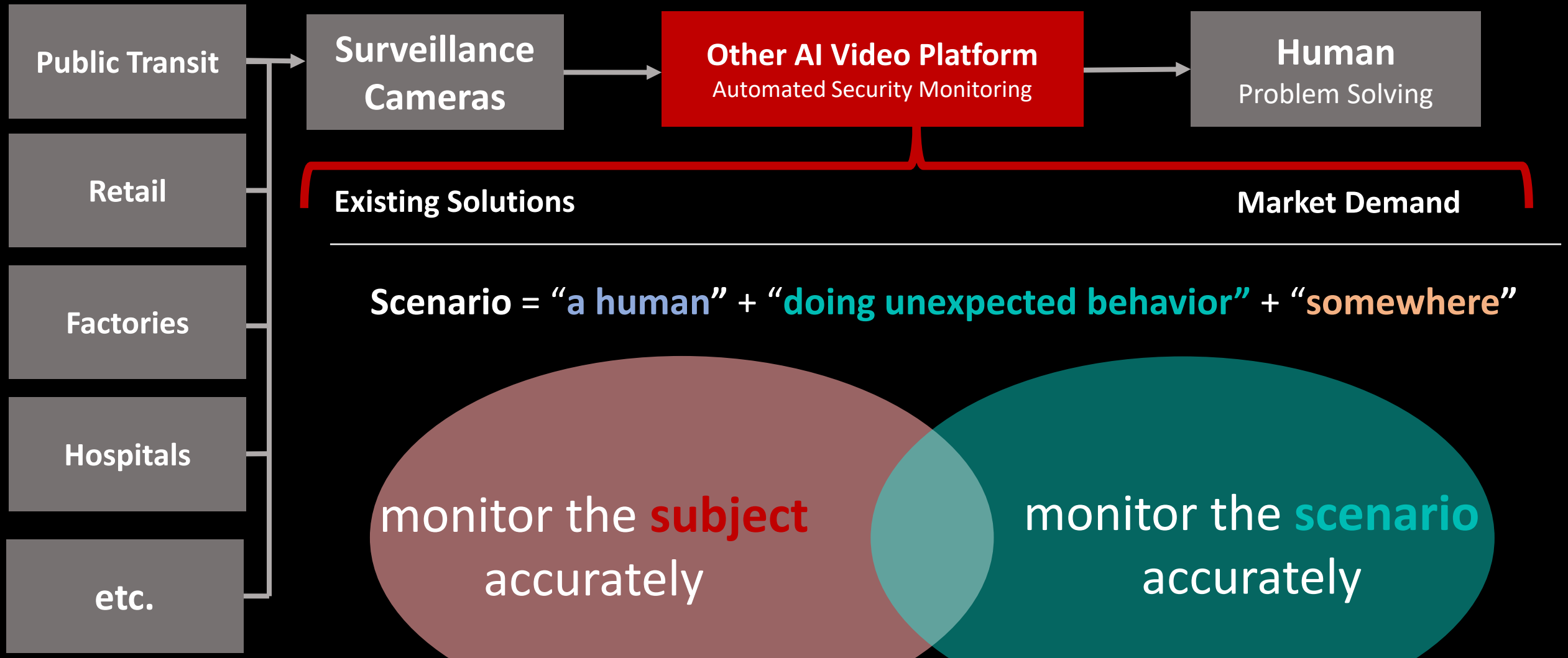


- Accuracy > 99%

Sensor Devices

- Accuracy > 70%,
- Very Cost-effective

Why Existing Solutions are INSUFFICIENT?



STEP.1 Beseye Skeleton-Print™ Technology

Scenario = "a human" + "doing unexpected behavior" + "somewhere"

Extracts ~4,000 Biometric Points

Extracts Human Features

- Human Info
- User Group Info
- Body Info
- Skeleton Info
- Silhouette Info

Reduce AI Computing Time

Compression Module

Interprets Human Behavior

Configurable Posture Module

Machine could answer questions like:

- a man missed a crucial step in operating the charging station
- a human climbing over a school fence
- ...etc.

STEP.2 Encapsulated AI into a Turn-key Solution

Support 95% of Security Camera

+

AI Edge Platform

+

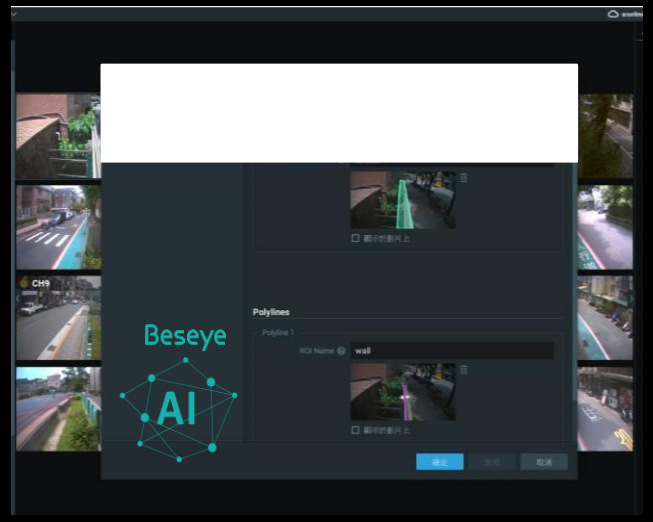
Video Management System (VMS)

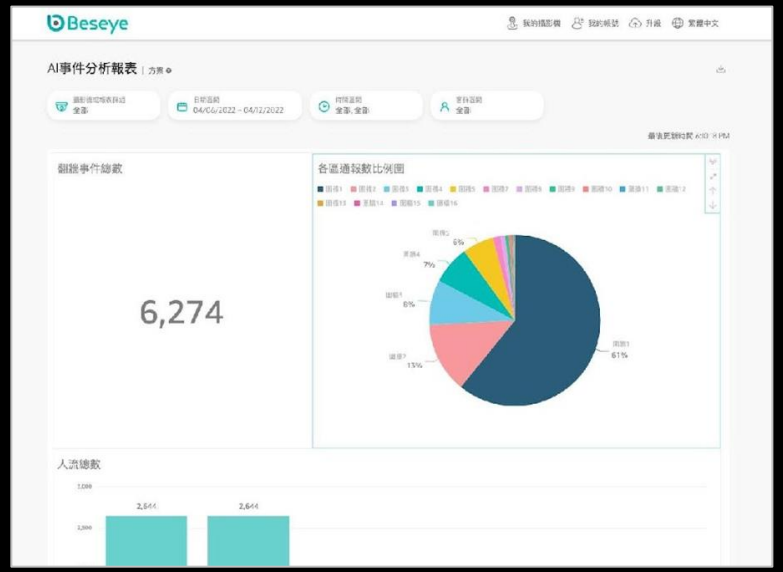
Turnkey Solution

Beseye × intel

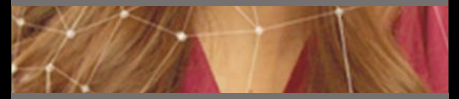
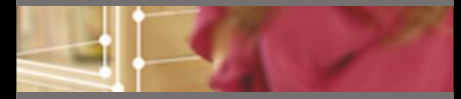
Make AI Easy to Use

Camera → AI + VMS → Instant Notification/Trend Statistics





Our AI Services

Behavior	User Group	Location
		
Waiting	Man	Bus Stop
		
Fall-Down	Elderly	Hospital
Skeleton Analysis	User Group Analysis	Location Analysis

Our Awards

Microsoft DevDays Hackathon Competition ASIA Champion

COMPUTEX d&i awards 2014

BC Best Choice AWARD

TAIWAN EXCELLENCE

DESIGN AWARD 2015

reddot award 2015 winner

GOOD DESIGN AWARD 2015

We, Human Being,
Has Been Waiting For 60 Years