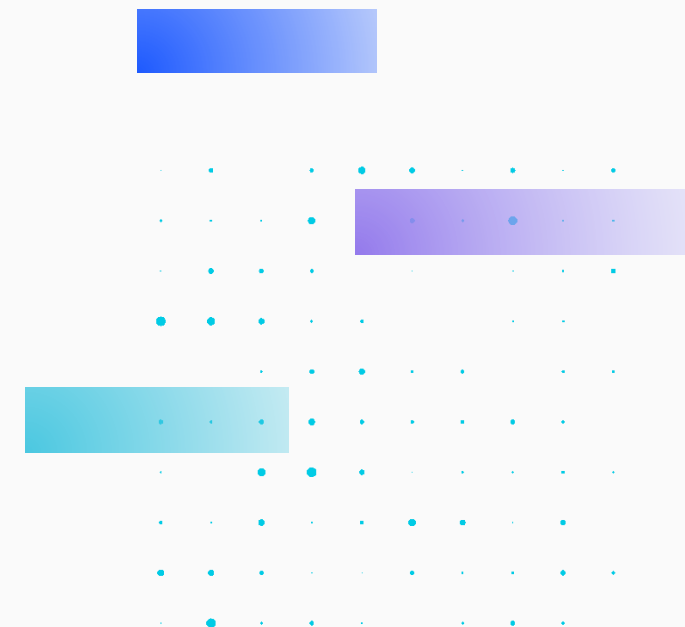


Corporate Introduction

晶睿通訊

Presenter: Rick Liu (劉誠傑) , Div. Head, Intelligent Video System Division

May 3, 2024





About Us

We're a global, **smart IP surveillance solution and service** provider, delivering trusted security, control, and management solutions covering a wide range of applications.

Global Employees:

1,300⁺

Countries with product
deployment

120⁺

Global distributors:

200⁺

VIVOTEK

IPO: 2011 (TWSE: 3454)

Headquarters: New Taipei City, Taiwan

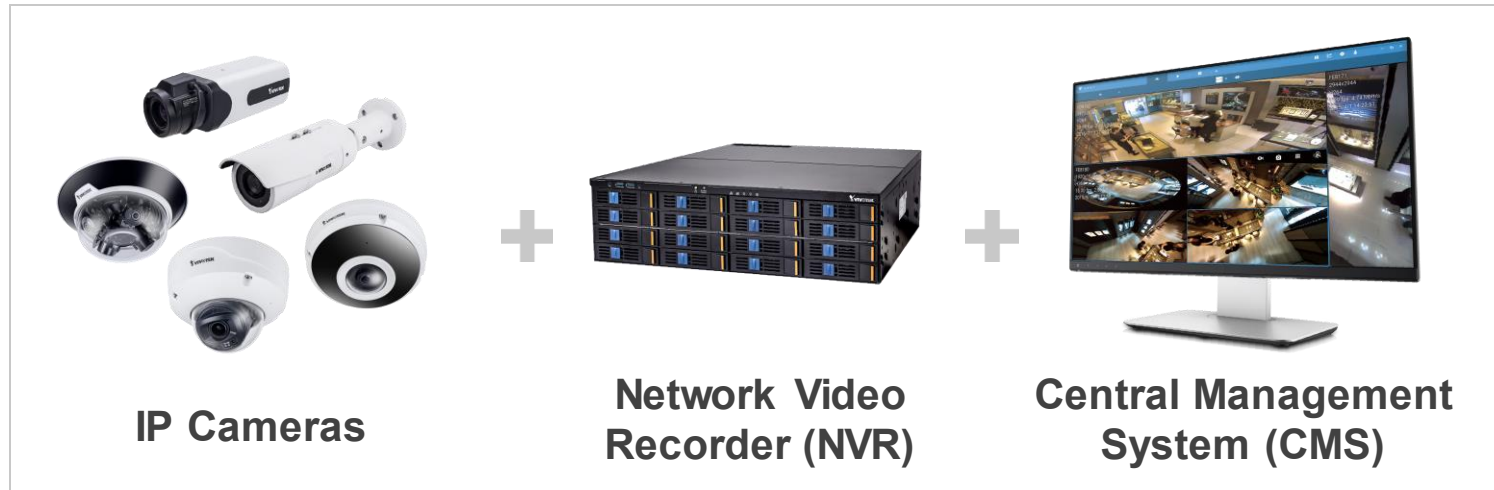
Founded in Feb 2000

Joined Delta Electronics in 2017

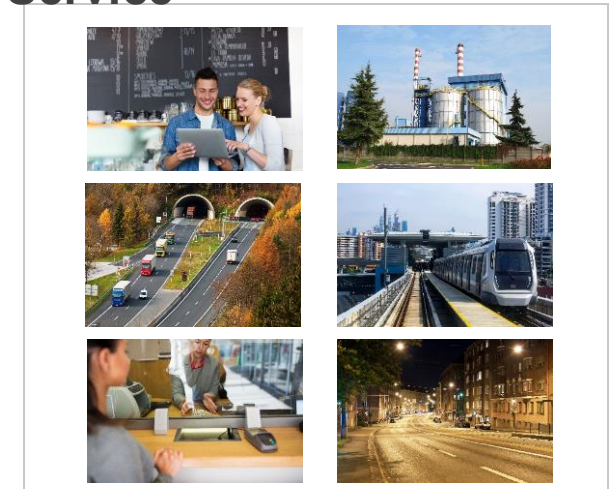
Business Offerings

Whether constructing systems for specific applications, or solutions that address the pain points of diverse vertical markets, our experience and expertise delivers the quality required for either goal.

Surveillance Systems



Surveillance Solution & Service



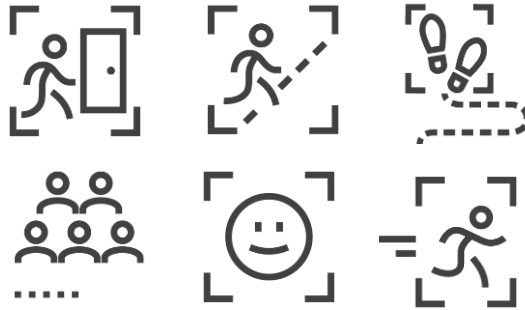
Technology Focus

Technology, R&D has long been our hallmark, because we believe smarter is safer.



Image Enhancement

With 22-year experiences, improving image quality with tech based on human perception.



Artificial Intelligence

AI analytics and deep learning are deployed in our supreme and value models, achieving highly accurate detection of objects and attributes.



VSaaS

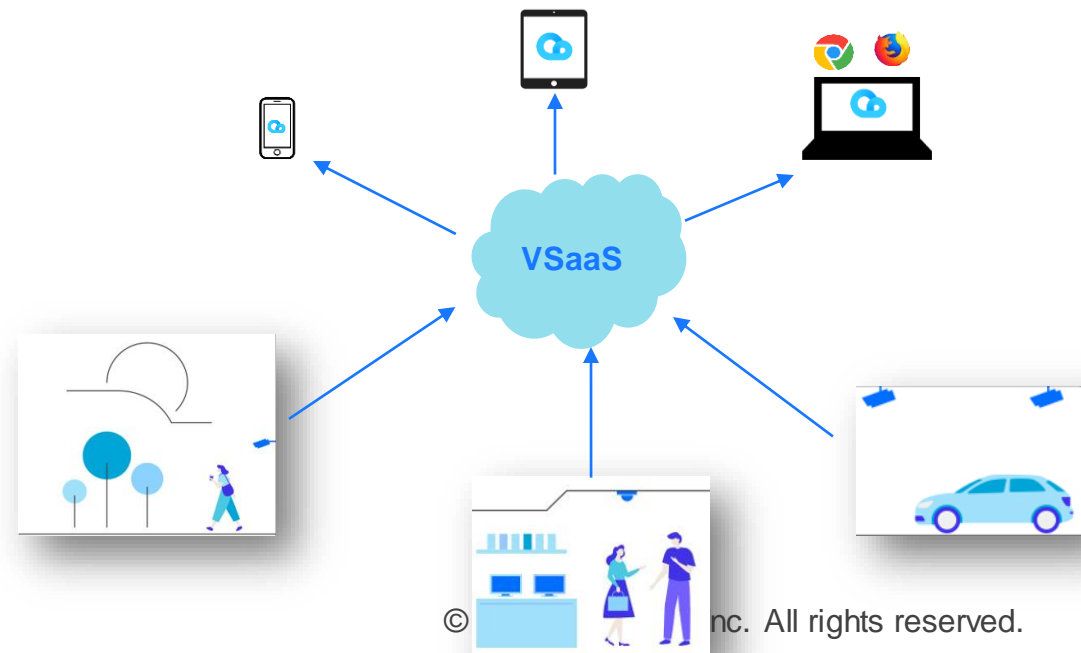
With service and user experience in mind, providing cloud storage with intuitive information access.

VSaaS Introduction

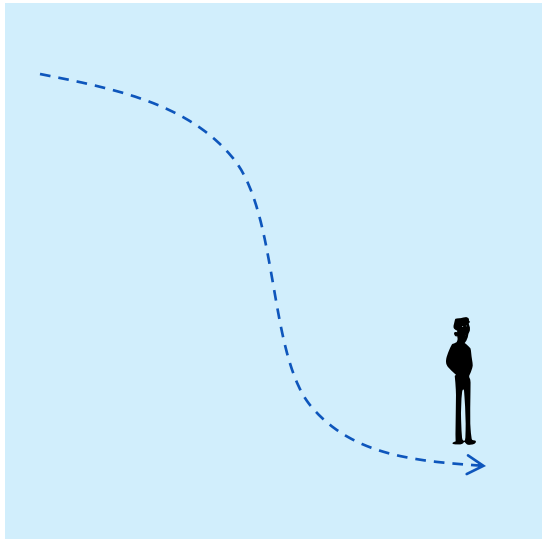
- Business Model
 - Service: **cloud-connected video surveillance devices**
 - Customer payment: **yearly or monthly**



- Data Storage
 - **Local** storage
 - **Cloud** Storage



Metadata for VSaaS



Object

- *Type: [Human, car ...]*
- *Timestamps*
- *Trajectory*
- *Attribute { age, gender, color ... }*
- *Feature Vectors*
- *Best Shot*

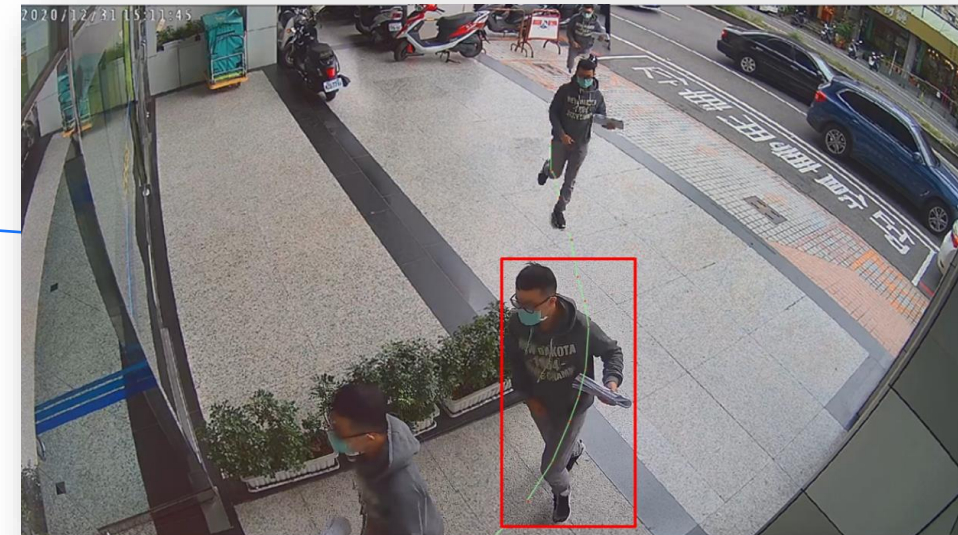


Metadata upload

Avg: 0 - 25 Kbps

VORTEX

Metadata DB





Final Project

Real-Time Monitoring of Door Status in Public Transit Systems

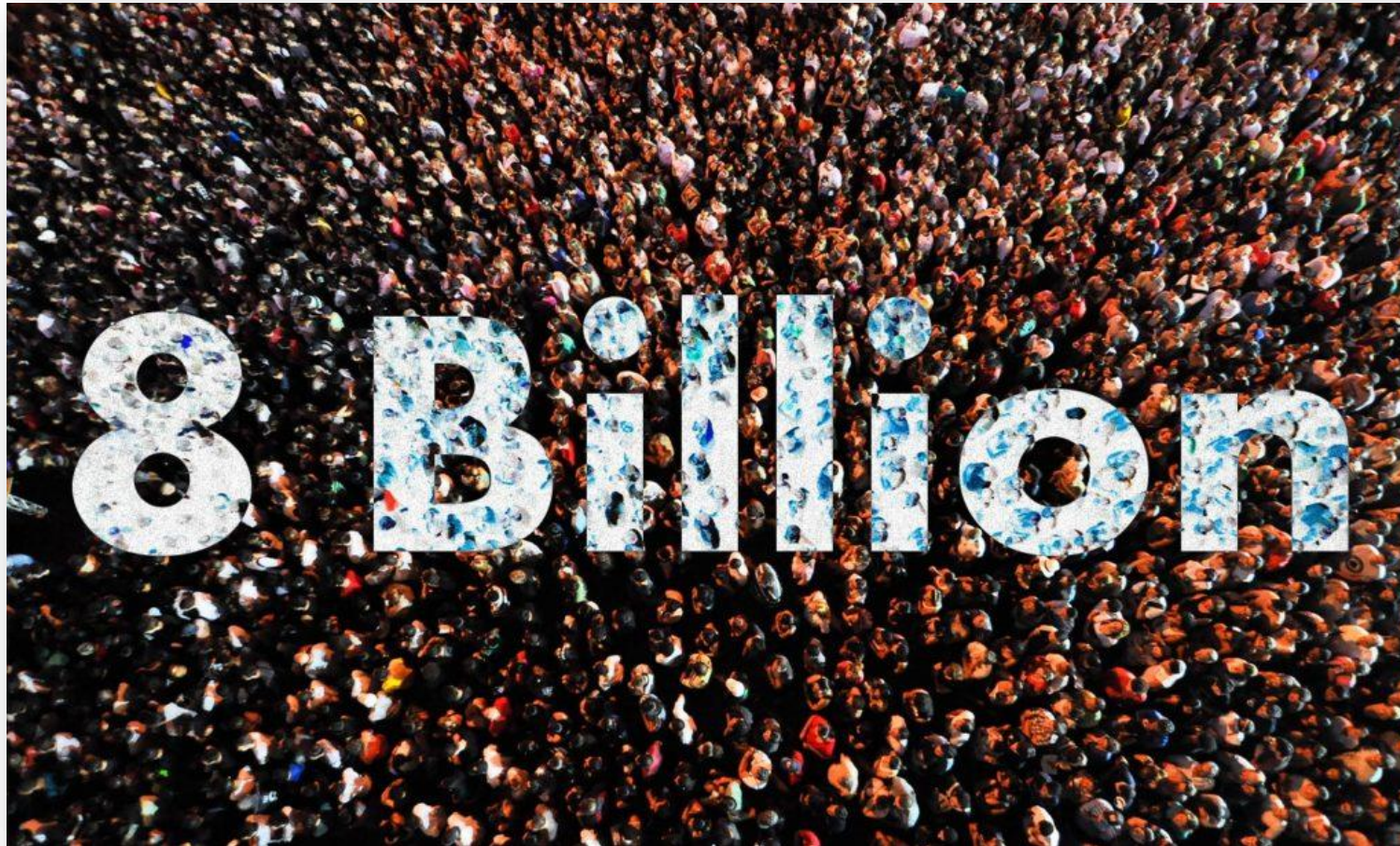


Eliminates the dependency of APC on external wiring for door status signals.



Automated Passenger Counter (APC)

Why Counting?



World Population Reaches 8 Billion



Why Counting?

Smart Transportation

Schedule optimization

Price optimization

Staff management

Prevent fare evasion

Profit Sharing



Passenger Counting

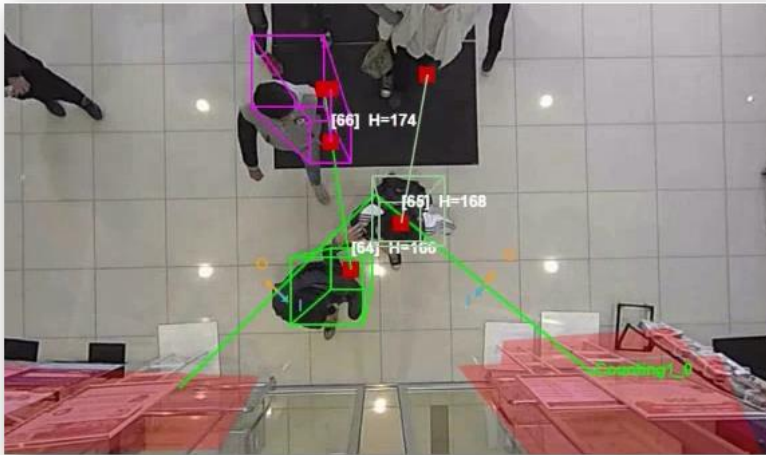
Why Counting?

Smart Retail

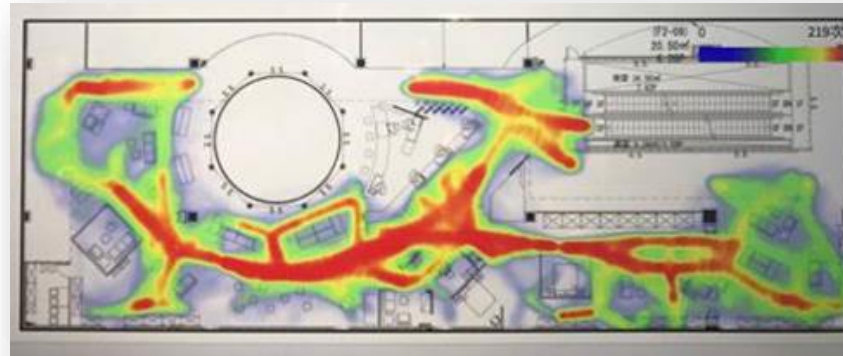


Brick-and-Mortar returns

OMO (Online Merge **Offline**)



People Counting



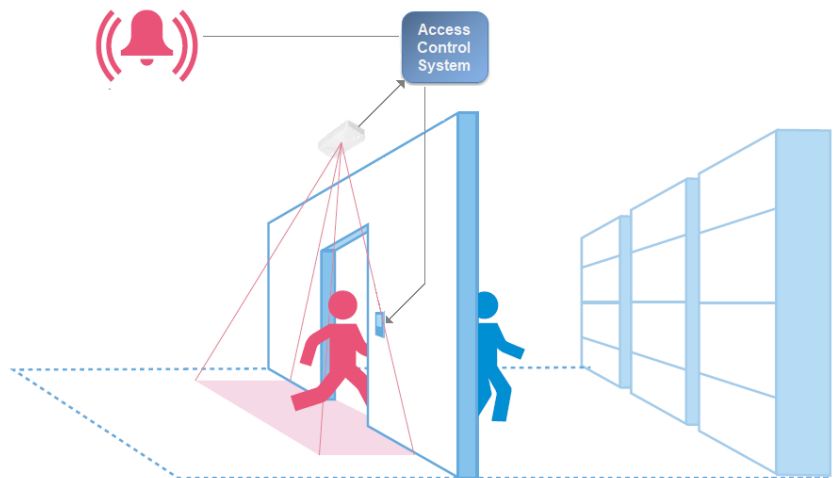
- Path Analytics
- Heatmap



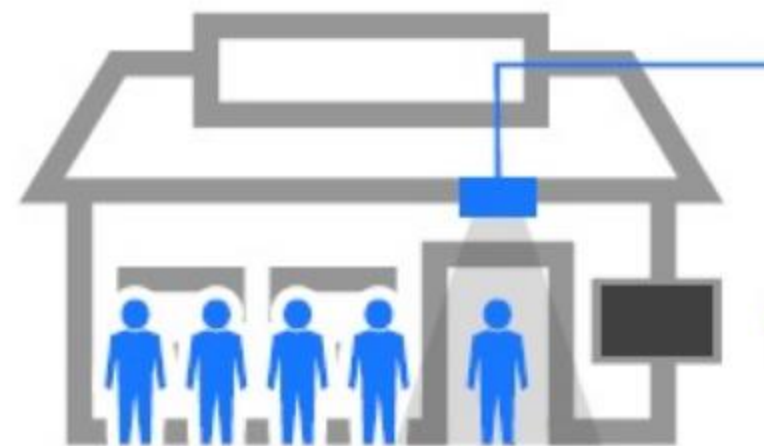
Queue Management

Why Counting?

Smart Building



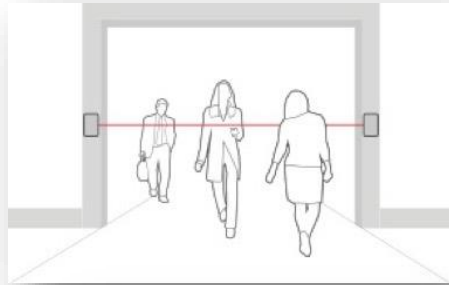
- Anti-tailgating
- Access Control



- Occupancy Estimation
- Crowd Management

Counting Technology

Infrared Beam

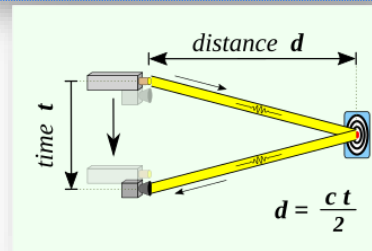


Very Low Cost



Low Accuracy

Time of Flight

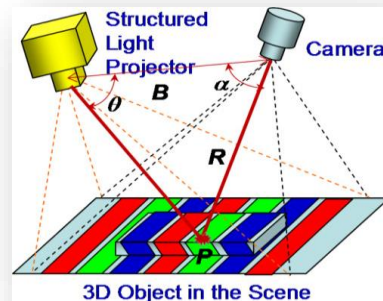


Low Cost, Higher Accuracy



Small FOV (Field of View)

Structured Light

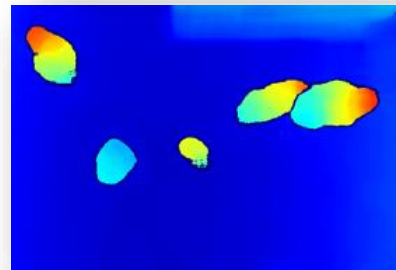


Higher Accuracy



Lighting interference

Stereo Camera



Very High Accuracy



Higher Computation Complexity

Technology Roadmap

SC8131



Stereo Camera

Retail

2014

SC8132

SC8133



Stereo Camera

Transportation

2015



Tier 1 Accuracy

SC9133

SC9133-RTL



AI-based Camera



World's Largest FOV

Retail

Transportation

AH-41610



mmWave



Privacy Preserving

Building

2022


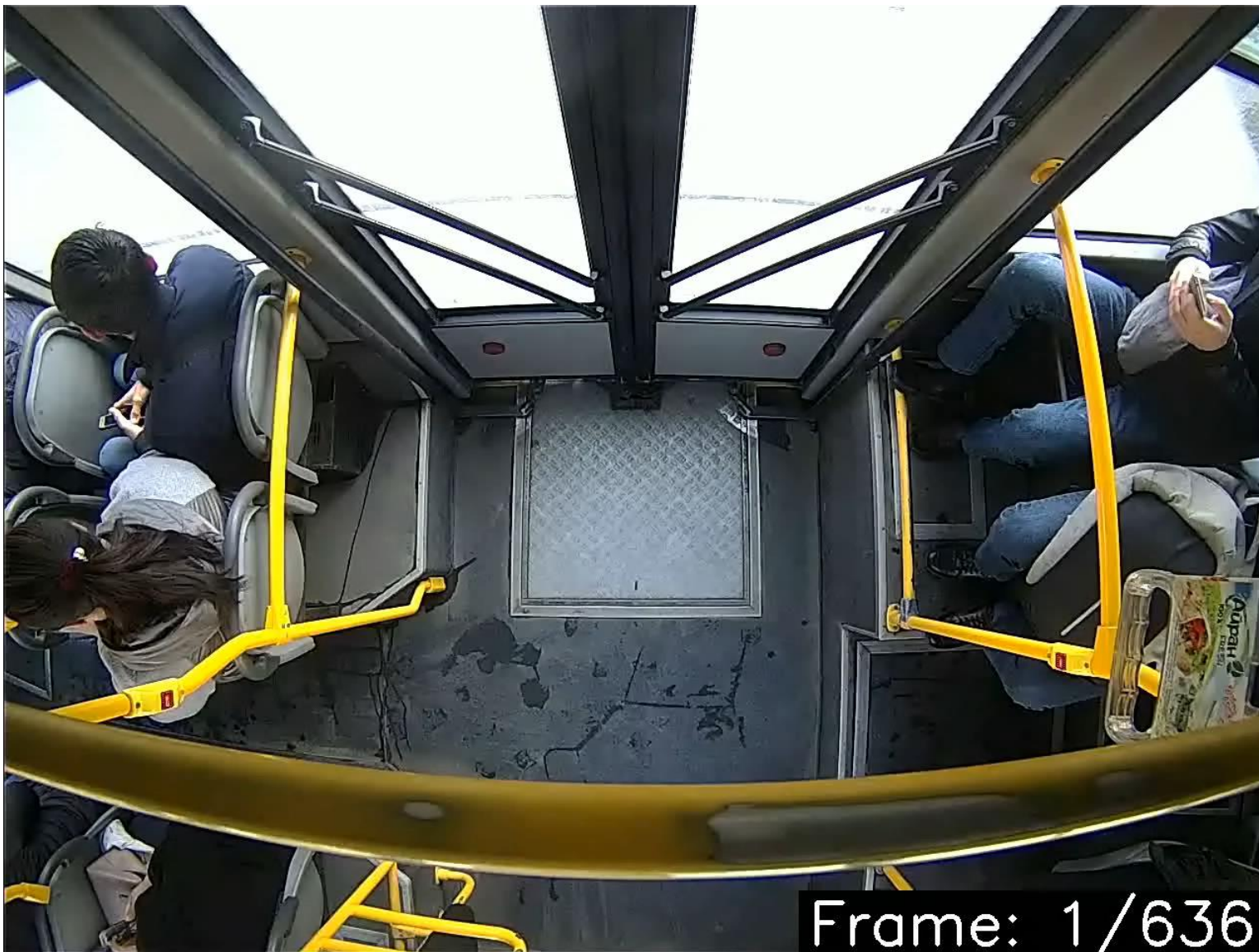
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Challenge of door status monitoring



- Generalized **door detection and localization** using camera video
- Accurate monitoring of door statuses, which include:
 - Closed/Opening/Open/Closing
- The system must also be robust against various interferences
 - **Occlusions** caused by passengers.
 - Variations in **lighting** conditions, including both strong daylight and low nighttime light.
 - **Movement** of the vehicle.
 - **Reflections** from glass surfaces.



```
"object": "Door",  
"states": [  
  {  
    "state_id": 1,  
    "description": "Opening",  
    "start_frame": 100,  
    "half_open_frame": 130,  
    "guessed_frame": 115  
  },  
  {  
    "state_id": 2,  
    "description": "Closing",  
    "start_frame": 178,  
    "end_frame": 220,  
    "guessed_frame": 199  
  }  
]
```



Implementation

The executable program should have the capability to:

1. Scan video files in a specified folder (*.mp4).
2. Analyze the video files with door opening/closing events.
3. Generate a JSON file with the guessed frame number of the input video for door opening/closing events.

Files in the project



Sample Video Files for Algorithm Development

01.mp4

02.mp4

03.mp4

These video files are intended for use in developing and testing your door state monitoring algorithm.

Sample Python Scripts

`total_frames.py`: Retrieves the total number of frames in a video file.

`algorithm_template.py`: Provides a template for creating a JSON file that can be used for evaluation.

`evaluate.py`: Implements the scoring method to assess the accuracy of the door state monitoring algorithm. Run this script to evaluate your algorithm based on the sample video files.

Sample JSON Files

`ground_truth_annotations.json`: Contains the ground truth data for the sample video files. Essential for algorithm evaluation.

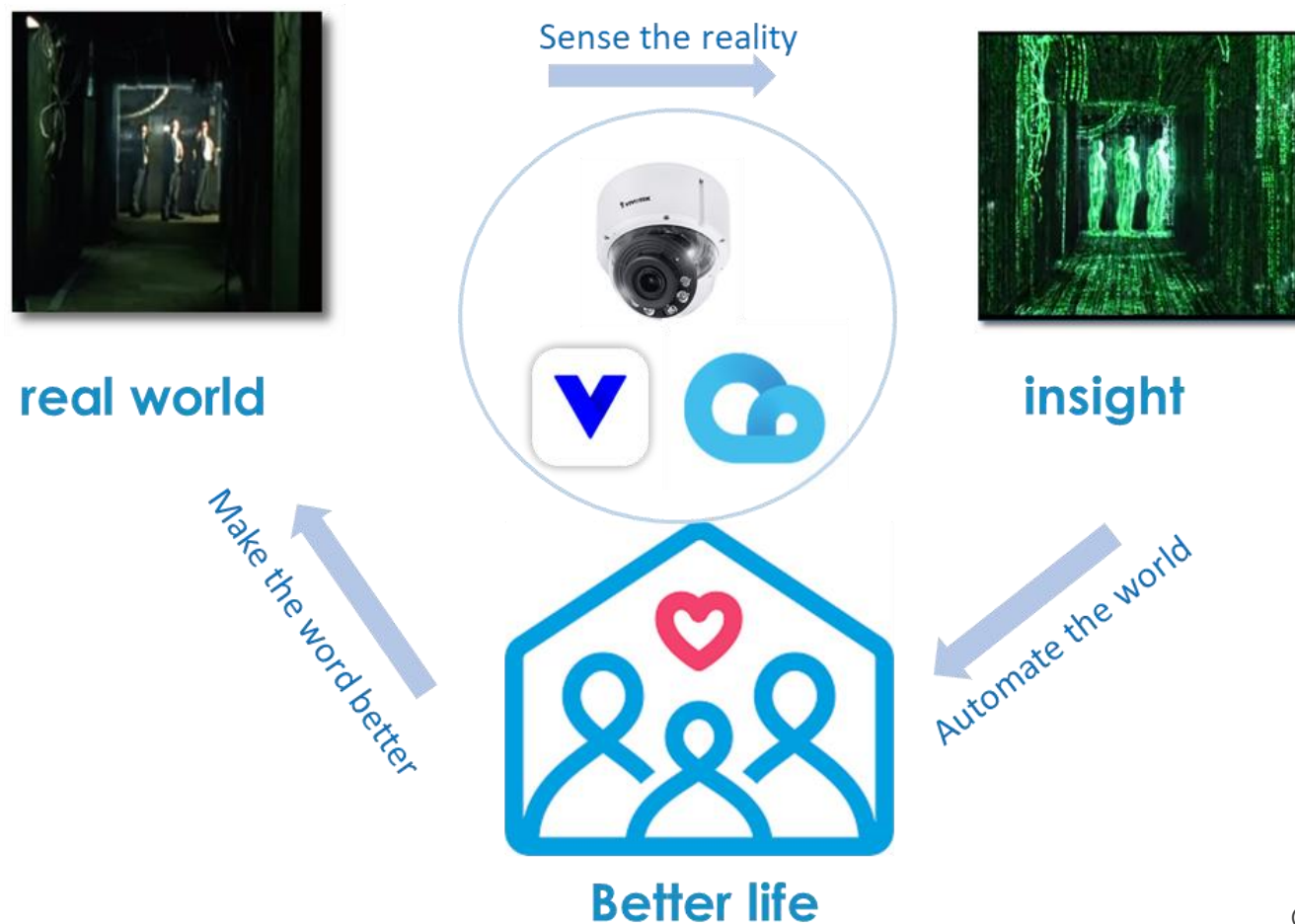
`algorithm_output.json`: An example of a JSON file generated by `algorithm_template.py`, used for evaluation purposes.

Evaluation - The criterion of score

- Objective Quality: (50%)
 - Ranking of prediction accuracy (on 10 test videos)
 - Inference time (If both teams have the same accuracy)
- Presentation: (50%) Top 10 teams
 - Novelty and technical contribution (20%)
 - Experiment completeness (25%)
 - Presentation (5%)
- Report: (50%) other teams
 - Novelty and technical contribution (25%)
 - Experiment completeness (25%)

Points	# of teams
50%	1
48%	2
46%	2
42%	The rest teams /4
38%	The rest teams /4
34%	The rest teams /4
30%	The rest teams /4

*Creating a world where smart sensors get insights from reality,
automating processes to make our life better.*



We Get The Picture

