

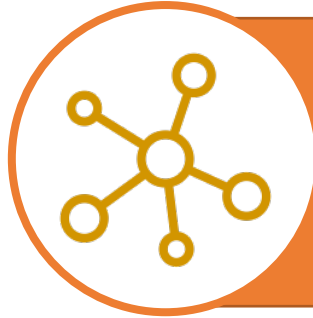


The organizational fitness tracker

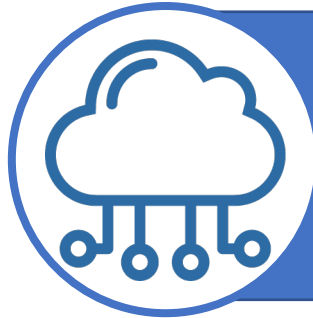
5G-enabled Real-Time Video Analytics on the Move

01 September 2021





Internet of Things Service
Strategically capture mission critical data



Cloud Computing Service
Store and integrate transactional and operational data



Artificial Intelligence Service
Make sense out of plethora of big data

30%

Inaccurate manual data entry

80%

Unstructured data
(Gartner 2018)



Stationary vs mobile (high bandwidth) IoT sensors

Stationary

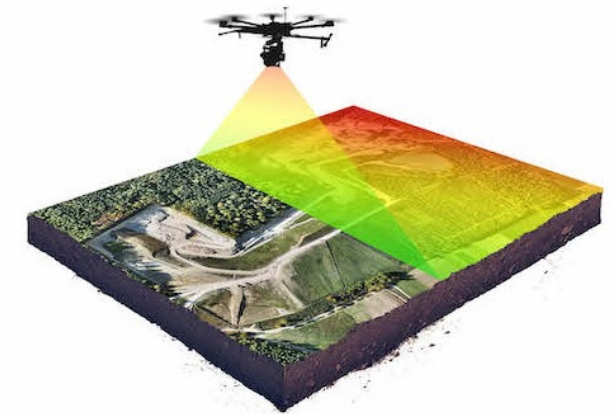
- Readily available sensors
- Stable data connection
- Mature AI models
- High set up cost



- IoT sensors mobility
- Rapid deployment
- New use cases
- Data transfer



Mobile



5G-enabled Real-Time Video Analytics on the Move @HKIA

The screenshot displays the ubiZense Smart Vision web interface. The browser address bar shows '52.116.48.12/index.html'. The interface is divided into several sections:

- Turnaround Analysis Table:** A table listing various events and their detection status.
- Object Detection:** A live video feed of an airport tarmac with yellow bounding boxes around objects like 'Dolly' and 'Chock'.
- Action Detection:** A bar chart showing the probability of various actions.
- IoT Detection:** A table listing detected IoT equipment.
- Timeline:** A horizontal timeline at the bottom of the interface.

Event	Status	Ensemble	Object Detection	Action Detection	VTS
marshaller_on_position	●	Pending	18/12/2019 17:20	Pending	Pending
on_chock	●	Pending	Pending	Pending	Pending
thumbs_up	●	Pending	Pending	Pending	Pending
alb_inner_dock	●	Pending	18/12/2019 17:49	Pending	Pending
alb_outer_dock	●	Pending	Pending	Pending	Pending
service_step_dock	●	Pending	Pending	Pending	Pending
for_repositioning	●	Pending	18/12/2019 17:40	Pending	Pending

Equipment Type	Timestamp	Enter/Leave
LDL	19/12/2019 15:08	Enter

Action Detection Chart Data:

Action	prob
LoaderUp	0.0
LoaderDown	0.0
CtDock	0.0
CtUndock	0.0
UldOn	0.0
UldOff	0.0
AirplaneDock	0.0
Pushback	1.0

5G-enabled Real-Time Video Analytics on the Move @HKIA

- Problem
 - Video capturing angle
 - Not all stands have CCTV
 - Stringent safety requirements of installation
- Solution
 - High-bandwidth IoT sensor installed in vehicle
 - Custom “on-the-move” AI on Edge
 - 5G data transmission to cloud
 - Custom full “on-the-move” AI in Cloud
 - Automated real-time analytics

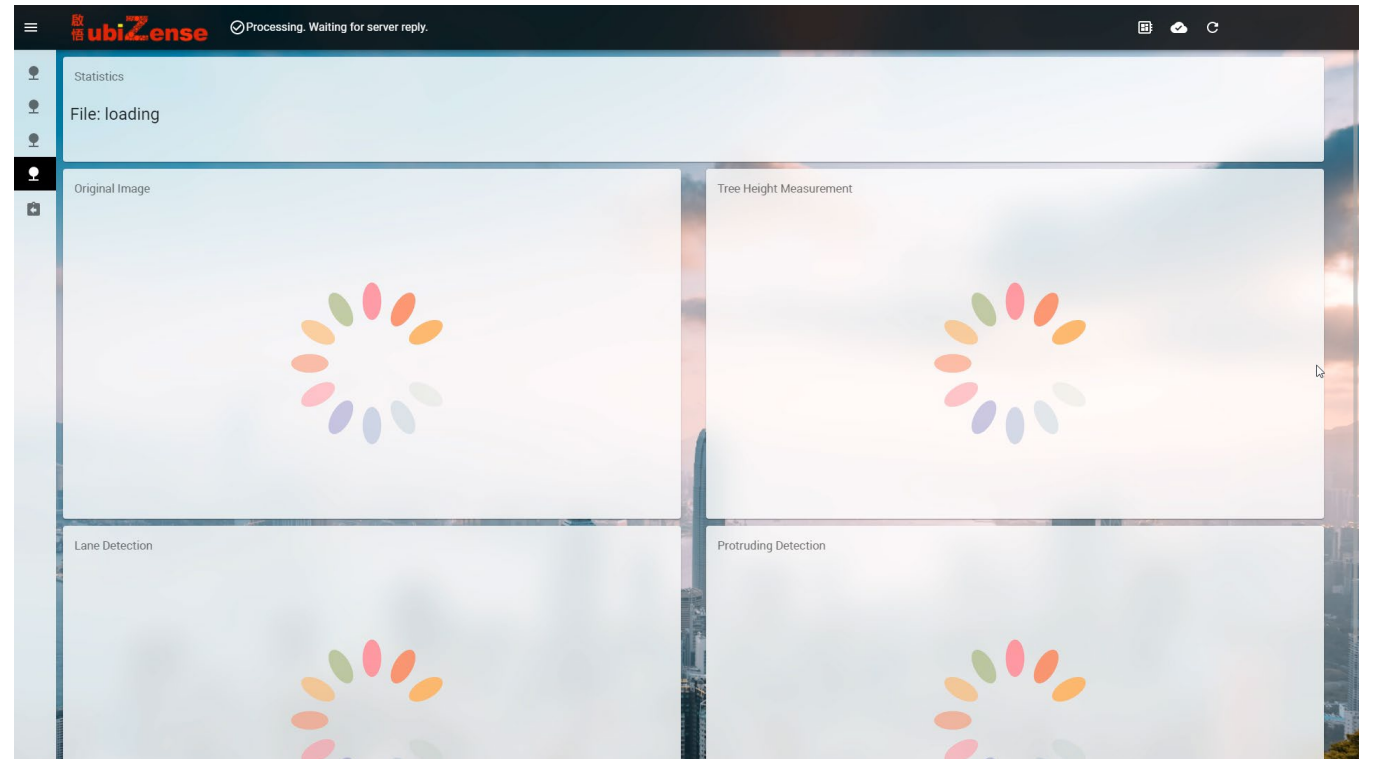


Other Potential Applications – Protruding Trees Detection

Stereo Camera to detect protruding trees

Current lengthy process using expensive LiDAR equipment

Cost efficient, quick detection, and fully automated



Other Potential Applications – Tree Survey

LiDAR for tree analysis

Current manual process to identify and measure trees

Cost efficient, quick detection, and fully automated

Detection complete. Total targets: 77

Tree ID	Trunk Width	Trunk Height	Crown Width	Crown Height	Crown Density
<input type="checkbox"/> 1	0.8036	1.3294	1.6943	1.5094	14.2103
<input type="checkbox"/> 2	0.4634	1.2899	3.8706	1.3905	11.1568
<input type="checkbox"/> 3	0.5866	1.0922	6.3455	1.7599	5.2040
<input type="checkbox"/> 4	0.4147	2.4731	4.0258	4.9432	10.0053
<input type="checkbox"/> 5	1.7631	1.7597	5.8635	3.3318	3.9837

Selected Categories TOGGLE ALL

- car
- bicycle
- motorcycle
- truck
- other-vehicle
- person
- bicyclist
- motorcyclist
- road
- parking
- sidewalk
- other-ground
- building
- fence
- vegetation
- trunk
- terrain
- pole
- traffic-sign

Tree View 3D VIEW

5G as an enabling factor for high bandwidth IoT sensors

- 5G enabler for high bandwidth IoT sensors
- New applications by leveraging mobile sensors
- Real-time analysis with full AI models
- Fully automated and cost-efficient solutions
- Only tip of the iceberg

Q&A