Clementine

ULTINOUS · BEYOND THE UNSEEN

Ultinous Video Analytics

Agenda

Technology features

Business applications

Q&A

Ultinous – What do we do

Technology: AI-based predictive video analytics

Key solutions: Human centered:People detection, face recognition, age&gender detection, tracking, headpose, movement and body parts detection

What we do: Analyze multiple camera streams to generate actionable insights that increase operational efficiency or track customer behavior - in real time

Head/Face/Body detection

Real-time anonymisation
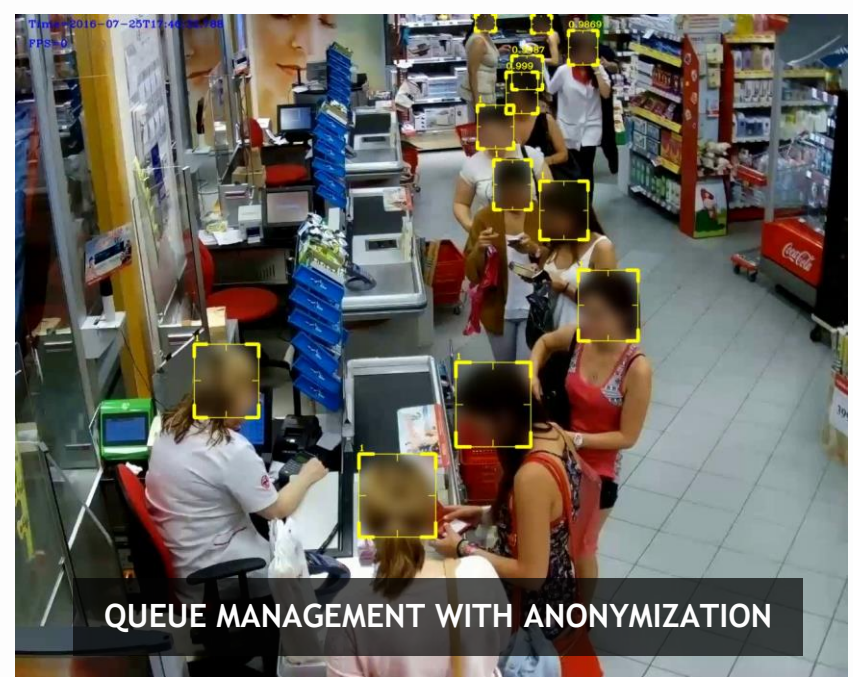
Face recognition and verification

Age and gender estimation

Person re-identification

Tracking

QUEUE MANAGEMENT WITH ANONYMIZATION
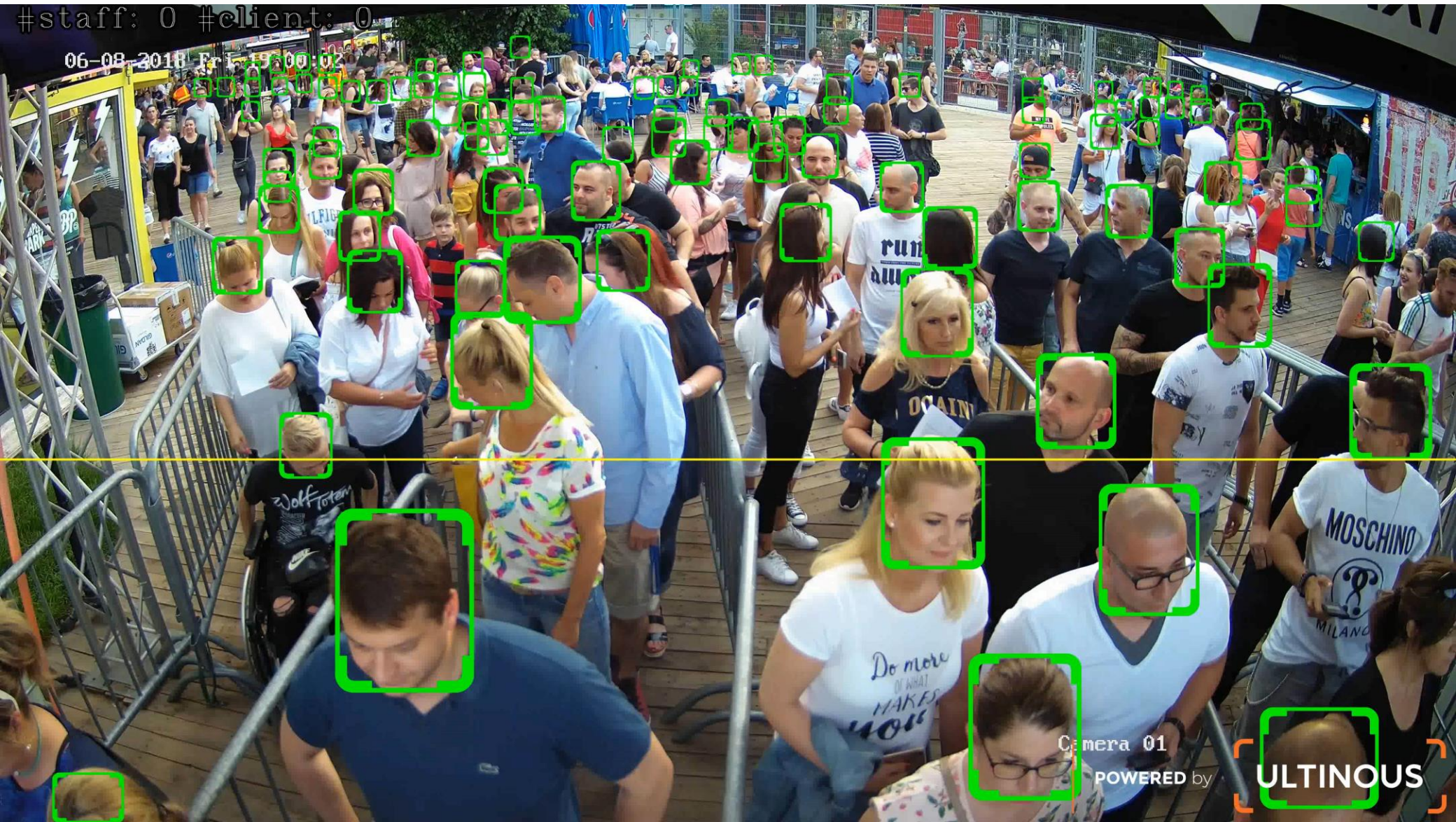

FACE RECOGNITION AND MATCHING FOR ENTRANCE SYSTEMS

Mass head detection in challenging environment

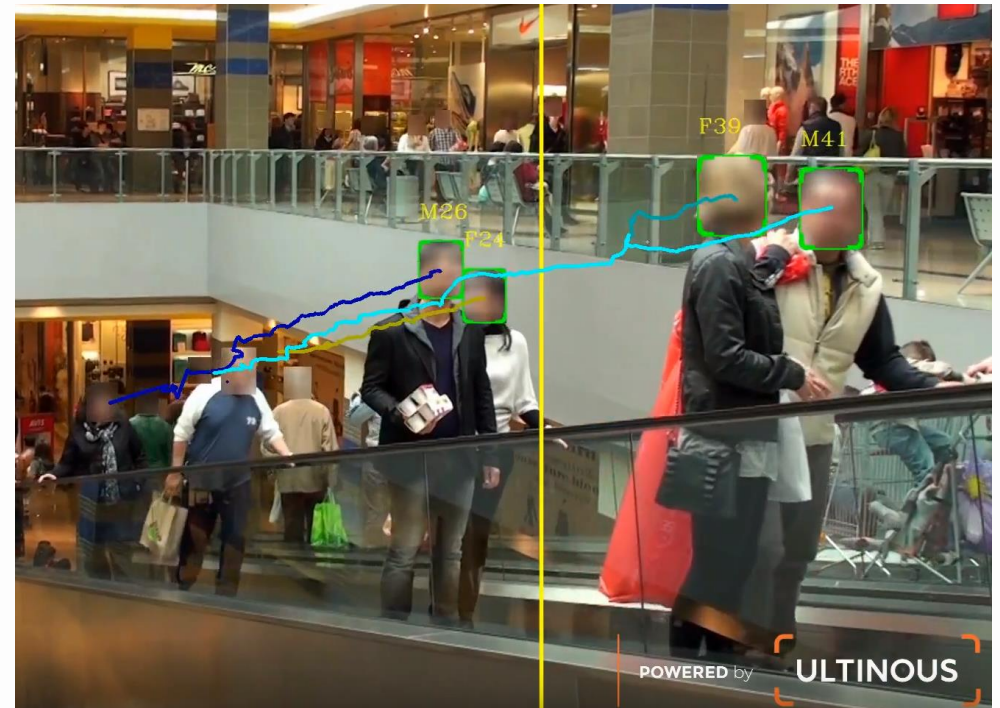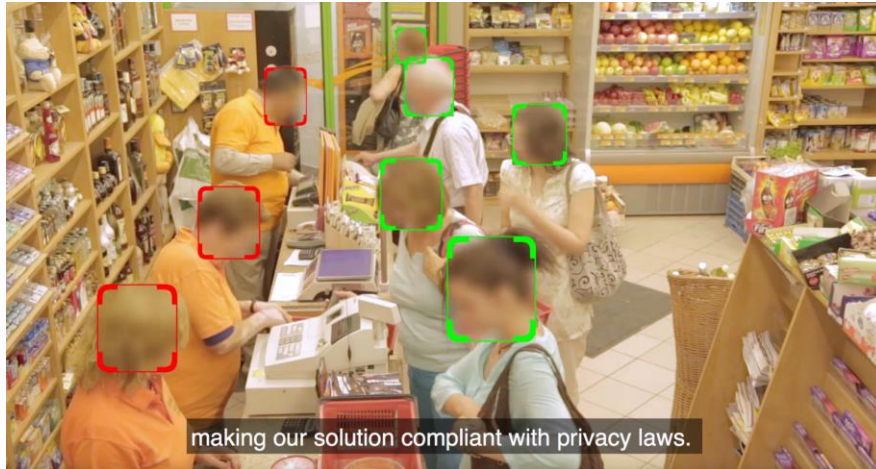Feature I: Head/Face/Body detection

Camera 01

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Face detection in non-collaborative environment

Feature II: Head/Face/Body detection, staff exclusion

GDPR compliance: Blurring faces real time

Feature III : Real-time anonymisation

making our solution compliant with privacy laws.

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Face recognition on a mass scale, real time

Feature V : Face recognition

Demographic distribution on mass scale

Feature VI: Age and gender recognition

Re-identification of individuals

Feature VII: Re-identification by matching entry/exit of individual based on face and upper body

Monitoring customer behavior

Feature VIII: Tracking and line-crossing in area of interest
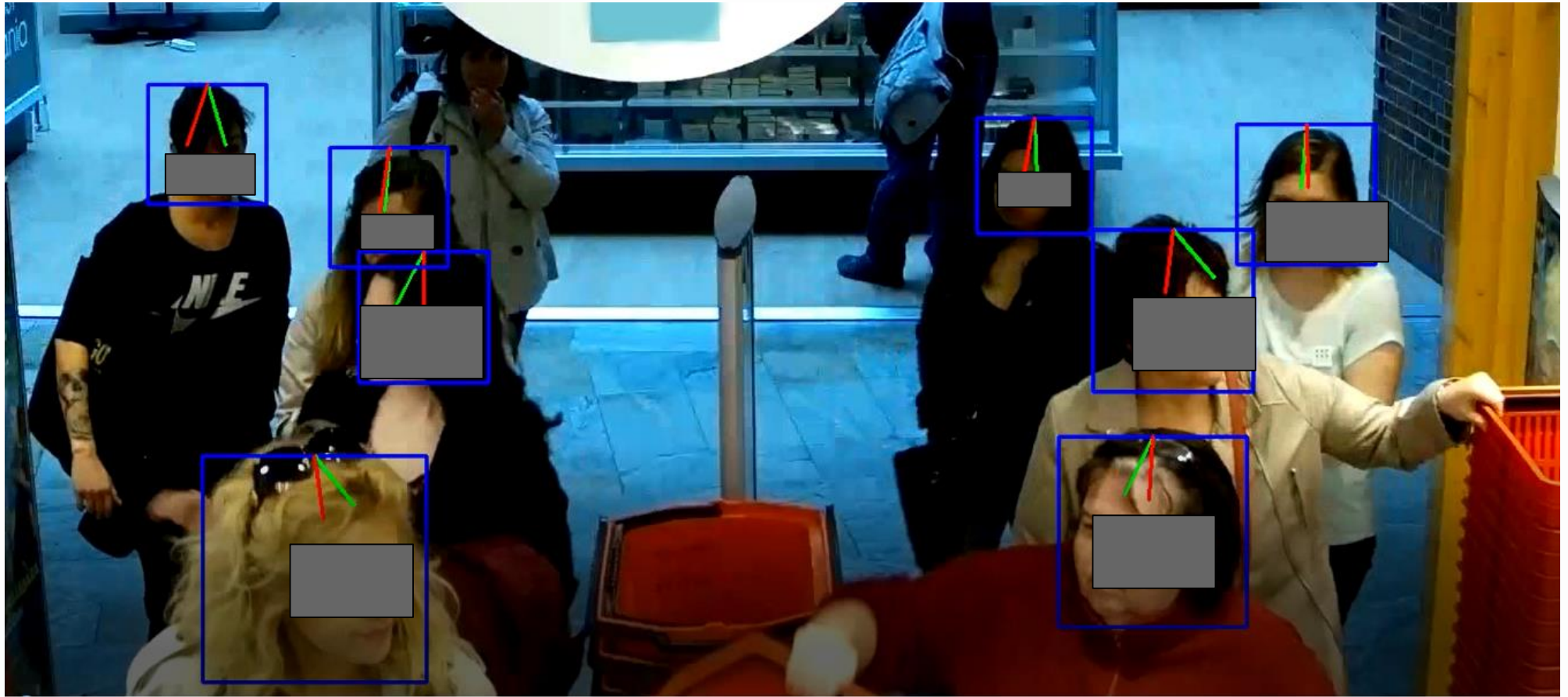
in:0

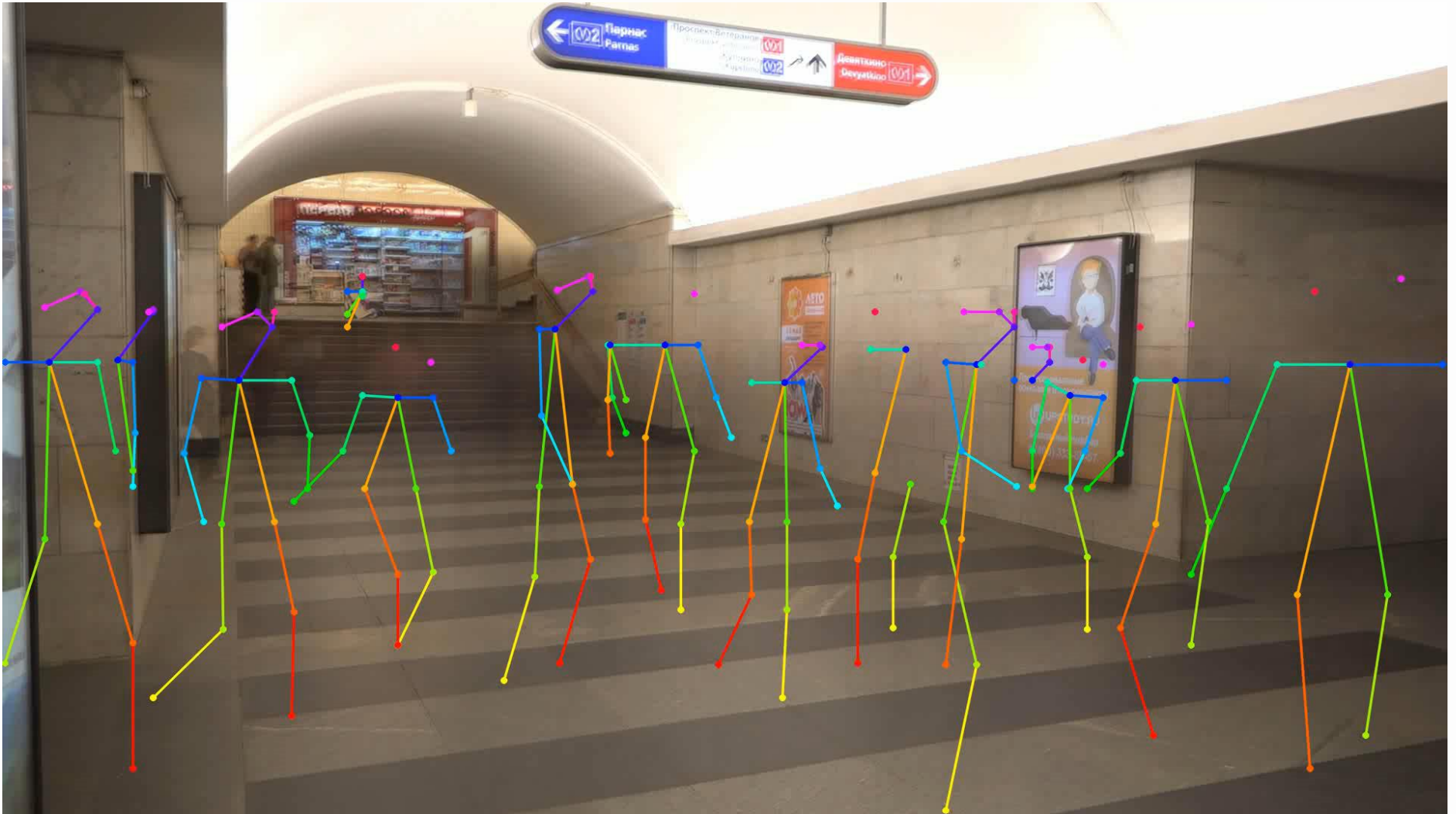# Insight on people's interest

Feature IX: Head pose detection

Köszön rlást!

MINŐSÉG
SOKSZÍNŰSÉG
ELÉGEDETTSÉG
MEGBÍZHATÓSÁG

ROSSMANN
SAJÁTMÁRKÁS TERMÉKEK

Rival
de Loop

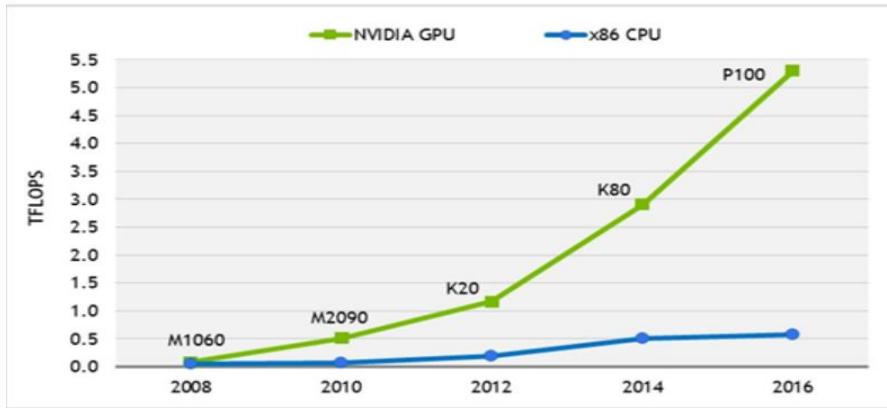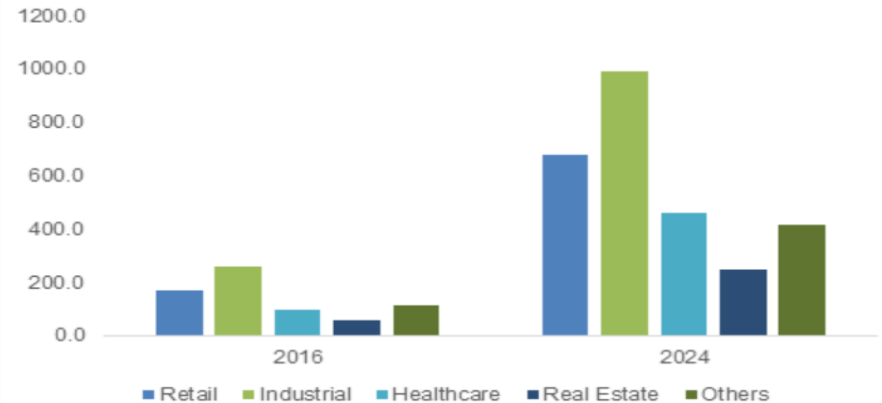# Movement and body parts analytics I

Movement and body parts analytics II

Technology developments that underline exponential growth in AI-powered video analytics

GPU price-performance acceleration

Legend: NVIDIA GPU, x86 CPU

TFLOPS axis: 0.0 to 5.5

Data points (NVIDIA GPU): M1060 (2008), M2090 (2010), K20 (2012), K80 (2014), P100 (2016)

Years: 2008, 2010, 2012, 2014, 2016

IP cameras to spread fueled by cost decline

U.S. IP camera market size, by commercial application (M USD)

Y-axis: 0.0 to 1200.0

Years: 2016, 2024

Legend: Retail, Industrial, Healthcare, Real Estate, Others

EDGE processing for min.latency, high reliability

Tractica

AI Edge Device Shipments by Device Category, World Markets: 2017-2025

Legend:
- Automotive
- Consumer and Enterprise Robots
- Drones
- HMDs
- Mobile Phones
- PCs/Tablets
- Security Cameras
- Smart Speakers

Y-axis: (Millions) 0 to 3,000,000

Years: 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025
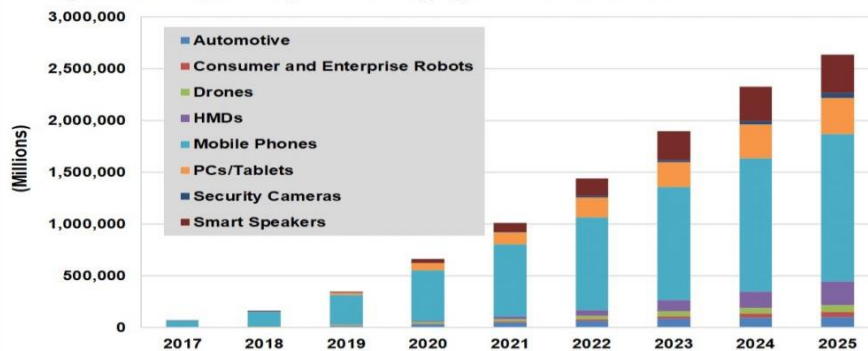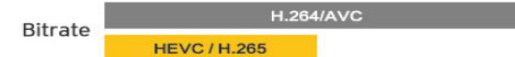
Source: Tractica

Compression performance saves bandwidth

HEVC Hard Decoding Makes Decode Faster, Better and Smaller

- Compared with H.264/AVC, HEVC has 200% higher compression ratio

Compression Ratio: H.264/AVC, HEVC / H.265

- In same resolution, HEVC/H.265 has 40-50% lower bitrate than H.264/AVC

Bitrate: H.264/AVC, HEVC / H.265

- Same quality of video data, HEVC Save 70-80% bandwidth sources

Bandwidth: H.264/AVC, HEVC / H.265

Value proposition: what differentiates from competitors

- Modular, a-la-carte service portfolio – flexible and easy-to-scale

- Full scale solution through video analytics – low complexity, no integration with other platforms (e.g. RfID, wi-fi) required, but available through APIs

- Use the existing CCTV video camera infrastructure – no upfront investments, no proprietary hardware

- Cloud based or locally installed server (on-premise)

- State-of-the-art technology: top accuracy and speed in non-collaborative environment („in the wild")

- UI and dashboard capabilities to enable real-time decision making at store level

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Rossmann: Queue reduction through alerting improved conversion rates of 3-6 points%
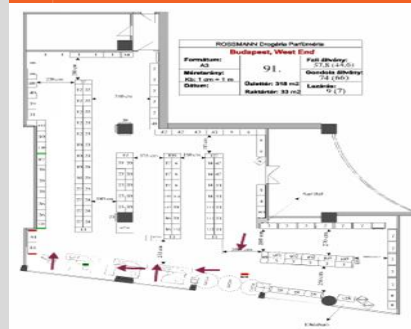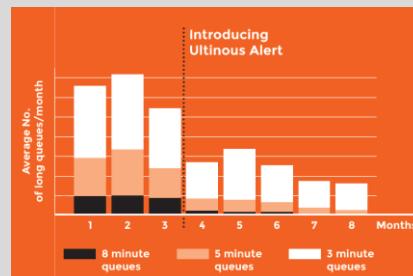
(ALERT)

ALERT SENT

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ROSSMANN

Predictive alerting: 85+% accuracy

- Predicts forming of queues before they happen and alerts staff to open new tills
- Guides staff scheduling to optimise the staff-to-customer ratio

Used data: end-to-end; most robust solution on the market

- Entering and existing visitor number
- Dwell times of customers by demography segments (age and gender)
- Checkouts open
- Number of people already queuing

Reference: Rossmann Hungary

- Ultinous service in operation since 2016 (40+ stores)
- ~1-2k visitors, ~10-20EUR average spend, 300-1,000 sqm
- Average scale of queue reduction: 70%
- 15M+ customer counted, 50 000+ alerts sent
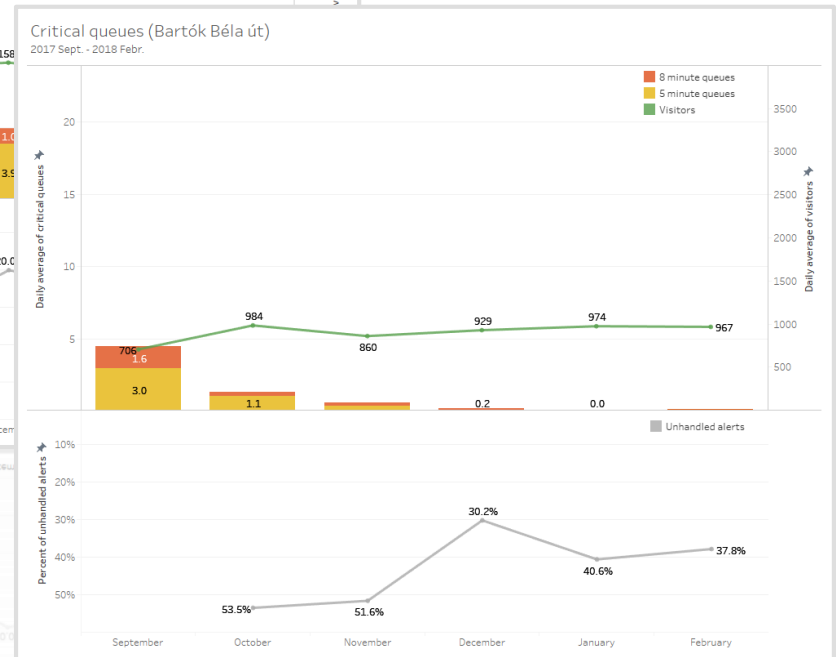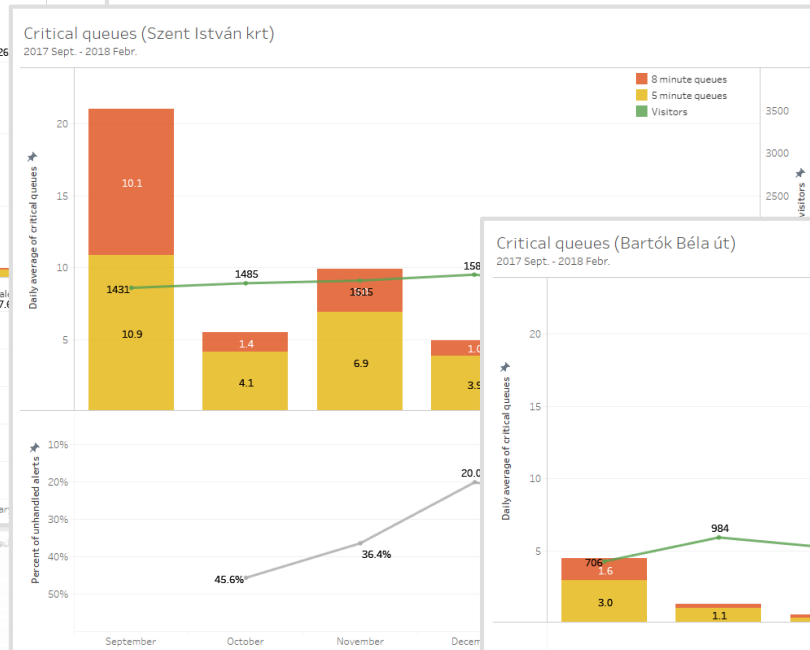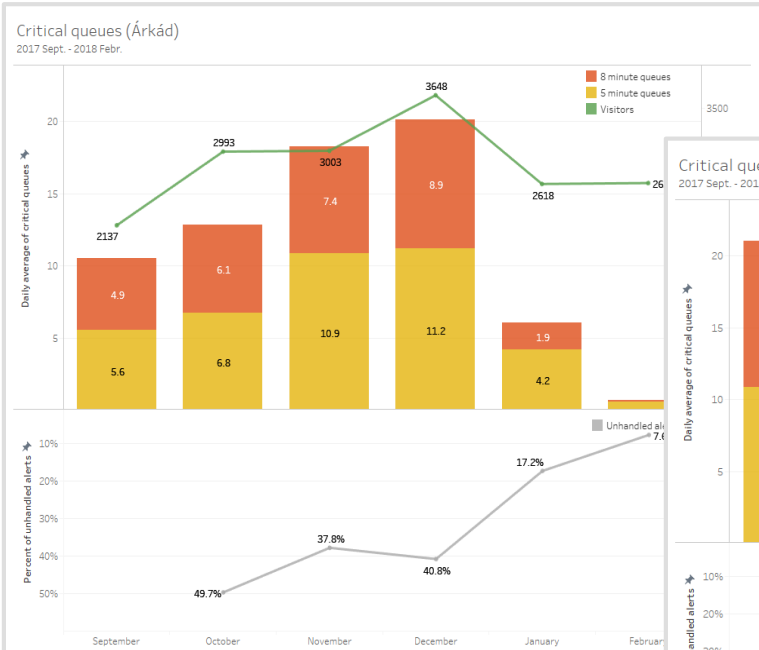- Cloud-based setup; headset integration

Introducing Ultinous Alert

Average No. of long queues/month

| Months | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

8 minute queues | 5 minute queues | 3 minute queues

ROSSMANN Drogéria Parfüméria
Budapest, West End

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Selected examples in stores with different customer patterns, volumes, locations and store sizes

Critical queues (Árkád)
2017 Sept. - 2018 Febr.

Critical queues (Szent István krt)
2017 Sept. - 2018 Febr.

Critical queues (Bartók Béla út)
2017 Sept. - 2018 Febr.

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Case study: Kappahl fashion stores

Kappahl profile

Kappahl is a Swedish Nasdaq listed fashion retail company with a strong position in Nordics. Revenue is ~470 M EUR.

Kappahl has a product range that is attractive to ladies and children.

~400 stores in Sweden, Norway, Finland and Poland, and Online

Kappahl is looking for solutions to improve operational efficiency and understand customer profiles

Solutions in pilot:
- ✓ number of in and outgoing customers
- ✓ average dwell time in shop
- ✓ demographic profile of customers

Success criteria

Success criteria
- ✓ reaching 99% accuracy by people counter
- ✓ build a statistically robust dwell-time model based on 30-50% of the visitor numbers
- ✓ reaching 95% accuracy rate of gender (+/-5 year age group)

Infrastructure
- ✓ 1 IP camera with 2K resolution needs an average of 1.5-2 Mbps guaranteed upload bandwidth for 1 video streams.
- ✓ In lack of bandwidth, Nvidia GPU powered on-site server (~1,000 USD hardware cost)
- ✓ 2 cameras per store on average

In case the POC is considered to be a success, roll-out to stores in Sweden from Jun-Aug

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② Back-up: Footfall counting
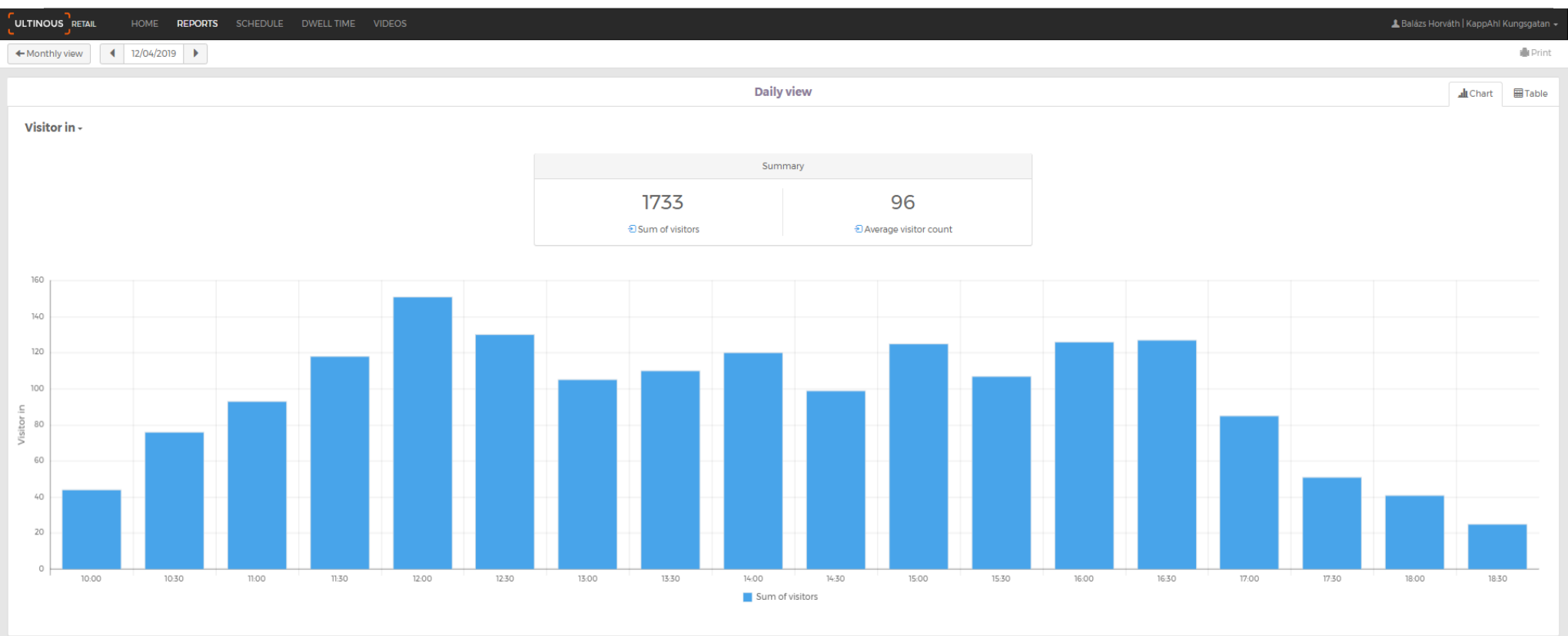
Back-up: Demography breakdown

② Back-up: Dwell time

Access control

Access control
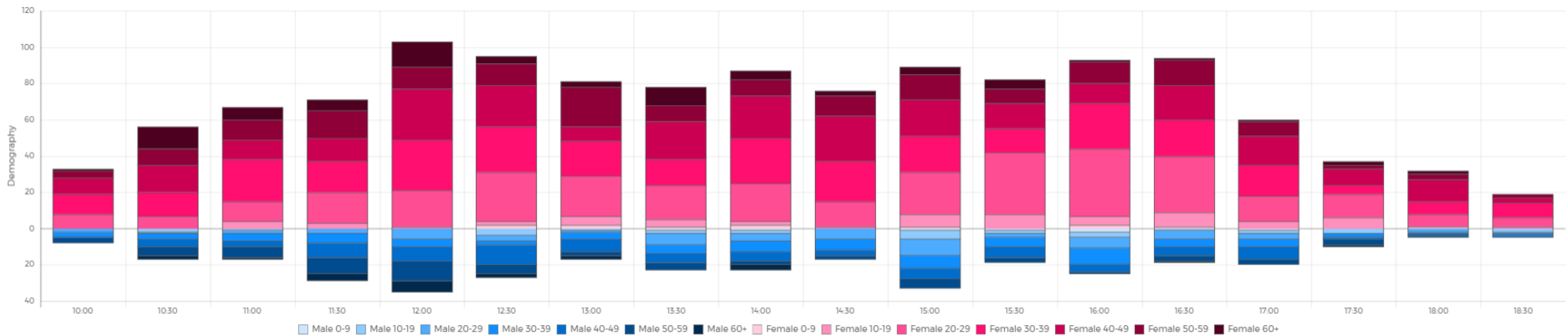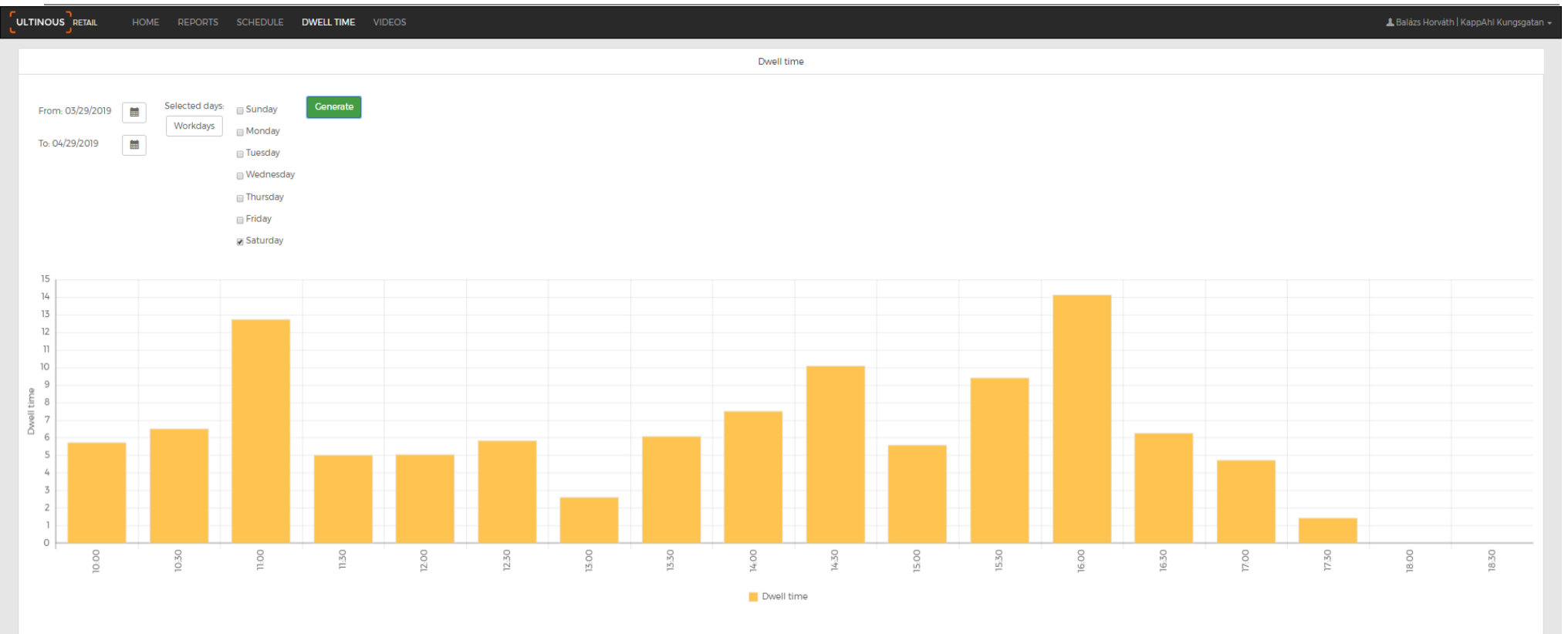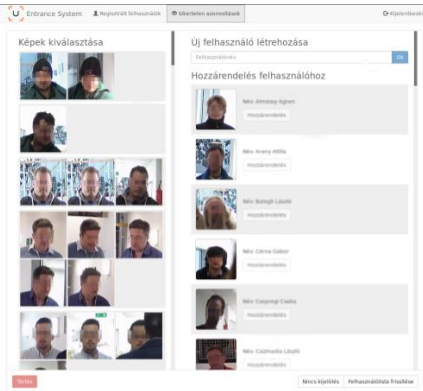
Managing the automatic enter and exit process of authorised personnel, alert on known offenders or unknown people. The system can be used alone or together with an RFID based solution.

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Partners

Germany:
FTI GmbH
H. W. Zipf
TaLa Security

Benelux:
Profit
Protection
Services

Nordics:
ITAB
InSupport

Taiwan:
AirDeck

UK:
BI3
Naxtech
CustomerClever

Ukraine:
C4R

Asia/ global:
Solution X

Baltics:
Retelektas

North America:
BSI
Dell Technologies

Hungary:
Laurel
Sellmore
Consulting
T-Systems
Konica - Minolta
Polsec Kft
Digital

Turkey:
Via-Vis

Japan:
NeoLab

France:
InStore Solutions

Middle East:
Taazur
Virtual Bridge
Falcor

South America:
Prosegur
Taquion Inovacao

Spain:
Kendu In-Store Visuals

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