BUILDING THE AI CITY AND SMART RETAIL

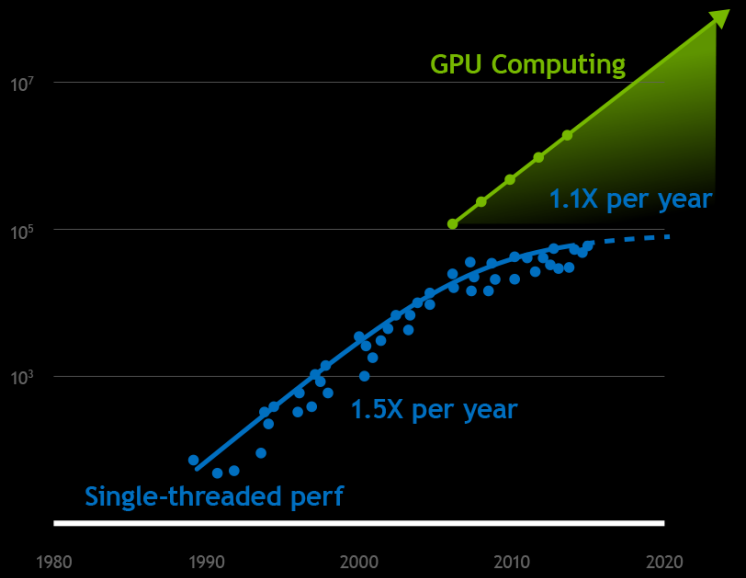
Anish Pandey
Industry Director – Nvidia

TWO FORCES SHAPING COMPUTING

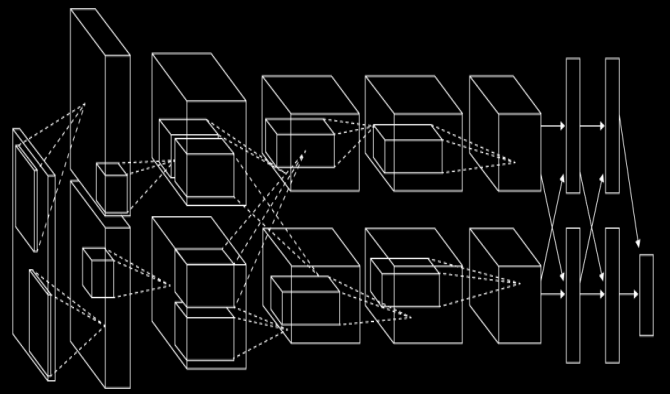
For 30 years, the dynamics of Moore's law held true. But now CPU scaling is slowing while the demand for computing power surges ahead.

With AI, machines can learn. AI can solve grand challenges that have been beyond human reach. But it must be fueled by massive compute power.

Accelerated computing is the path forward beyond Moore's law, delivering 1,000X computing performance every 10 years.



40 YEARS OF CPU TREND DATA



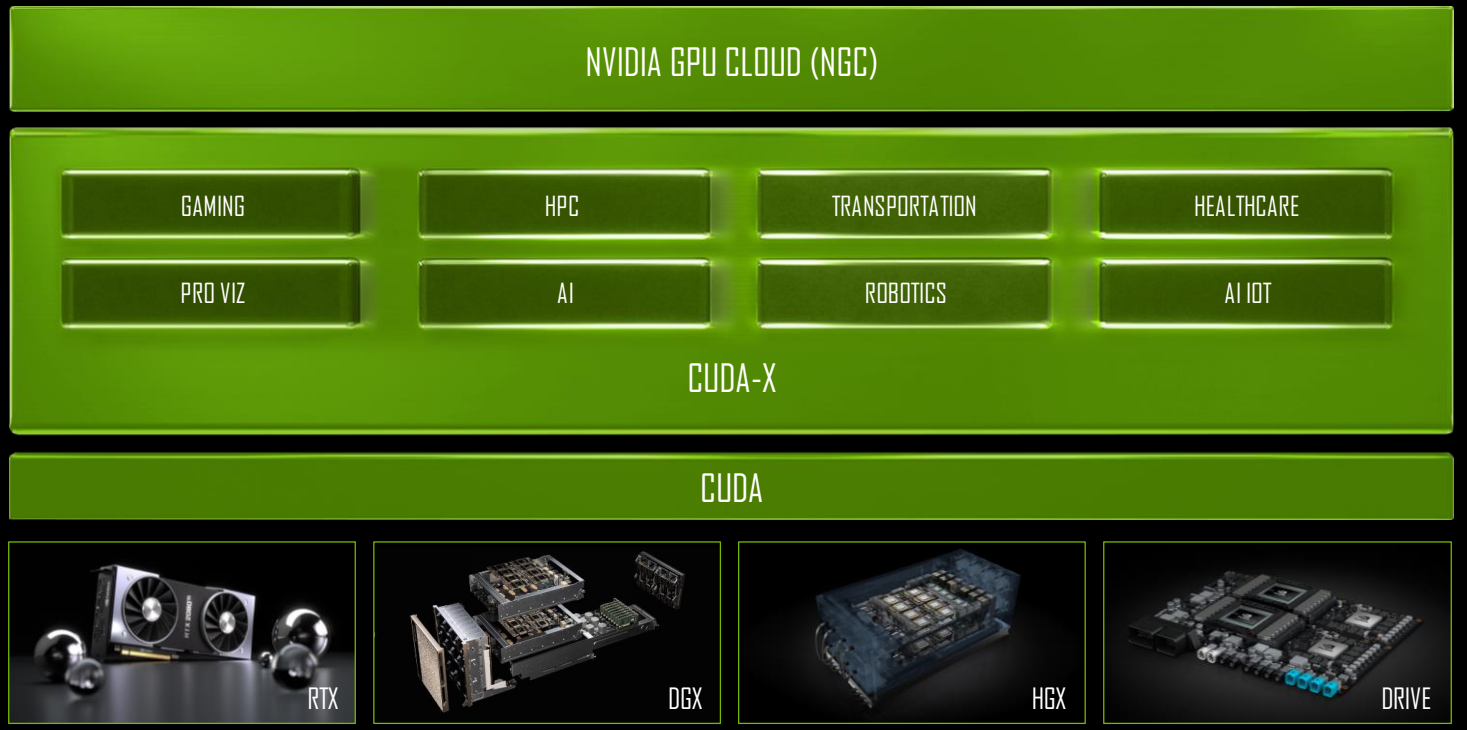
ALEXNET: THE SPARK OF THE MODERN AI ERA

Nvidia | Founded in 1993 | Jensen Huang, Founder & CEO | 13,000 employees | $11.7B in FY19

ONE ARCHITECTURE

NVIDIA is an accelerated computing company. It starts with a highly specialized parallel processor called the GPU and continues through system design, system software, algorithms, and optimized applications.

CUDA-X® is a suite of software libraries that accelerate applications for our growth markets — from gaming to transportation to healthcare — all based on a common CUDA architecture supported by more than 1.2 million developers today.



SMART CITY AND RETAIL

EFFICIENCY ▶

Traffic management

Retail analytics

Resource optimization

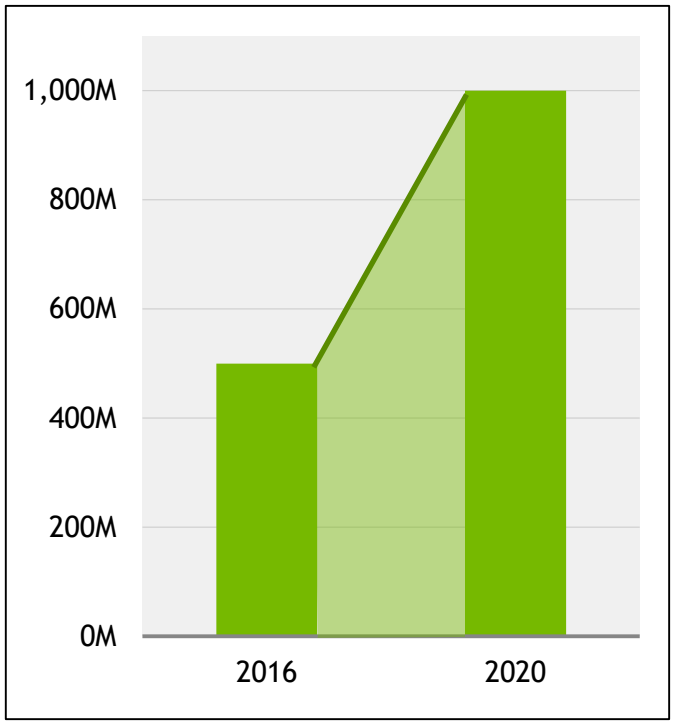
SAFETY ▶

Surveillance

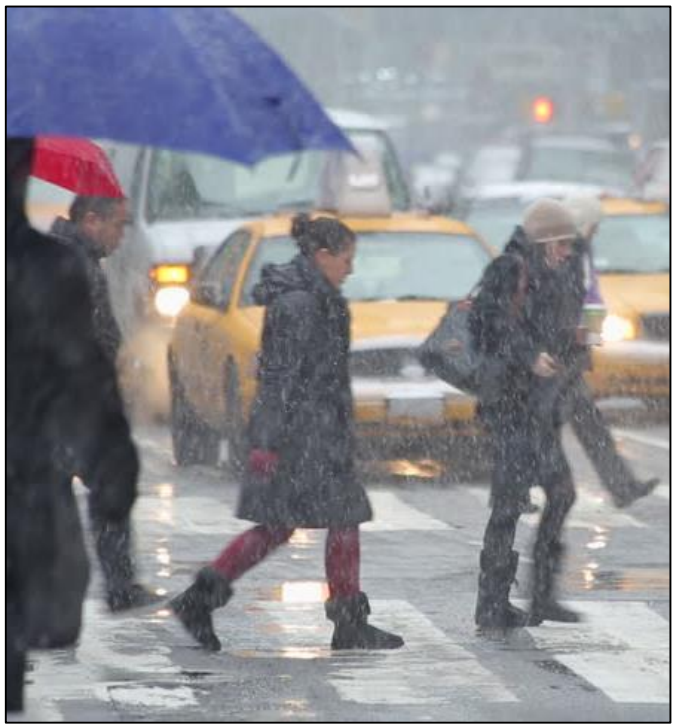
Law enforcement

Forensics

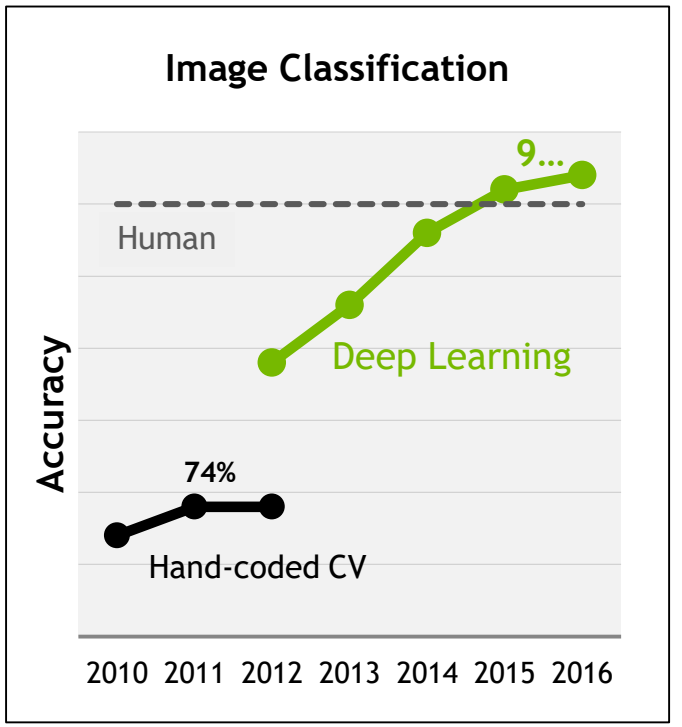
SAFE AND SMART CITIES IS AN AI PROBLEM



1 billion installed security cameras WW (2020)
30 billion frames per day



Challenging real world conditions
Traditional video analytics not trustworthy



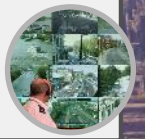
AI achieves super human results
AI driven intelligent video analytics

AI CITY NEEDS AN EDGE TO CLOUD ARCHITECTURE

CLOUD
1000s of cameras

Resource optimization

Public safety



ON-PREM SERVER
10s-100s of cameras

Traffic management

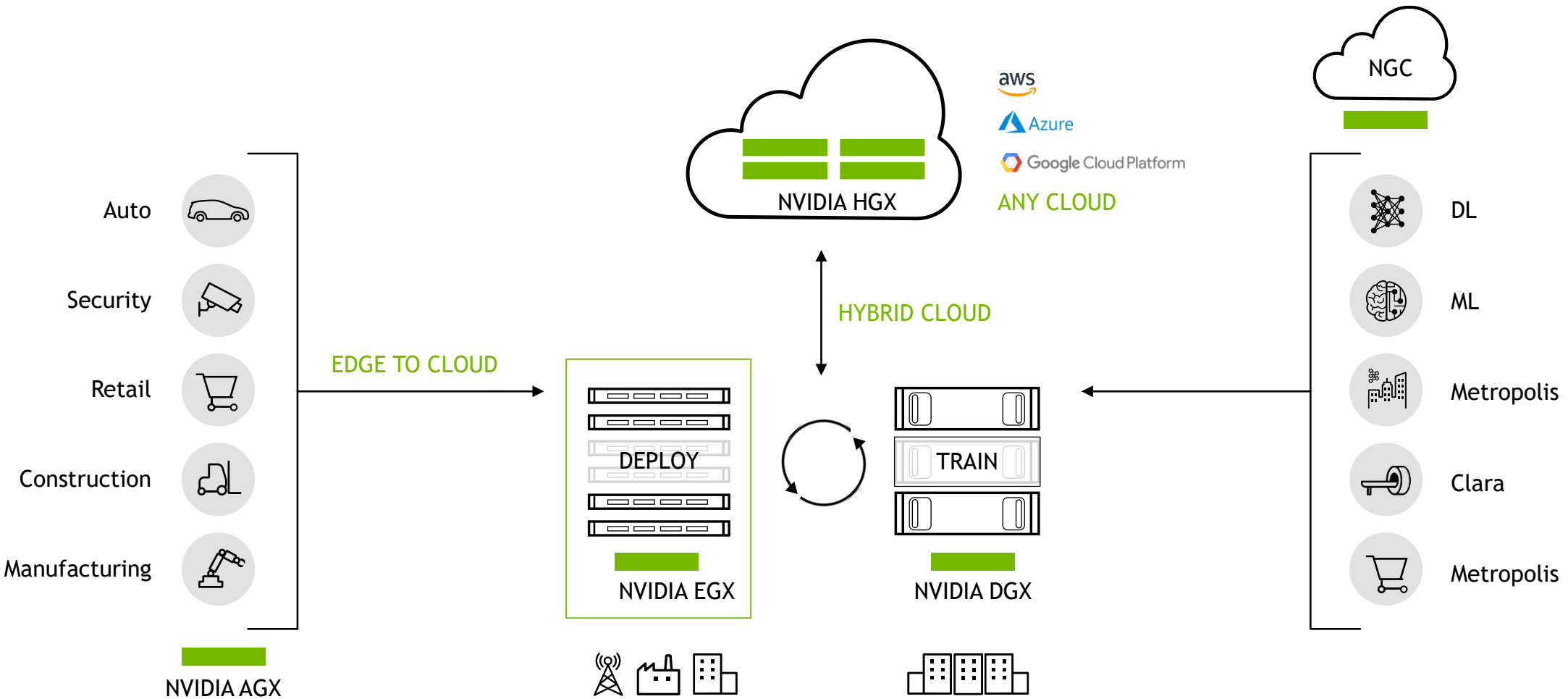
Airport security

CAMERA

Parking entrance

Law enforcement

NVIDIA EGX EDGE COMPUTING



Human:

- male
- female
- wear glasses
- riding
- backpack
- handbag

Vehicle:

- driver
- copilot
- safe belt fastened/not
- driver's sun visor
- copilot's sun visor
- phone calling

Camera 1 18:37:25 03/30/2017

ID: 17
18:37:25
White van

ID: 16
18:37:24
Grey suv

ID: 15
18:37:23
Black sedan

ID: 14
18:37:22
Black suv

ID: 13
18:37:22
Brown suv

ID: 12
18:37:21
White sedan

ID: 11
18:37:20
White sedan

ID: 10
18:37:19
Silver van

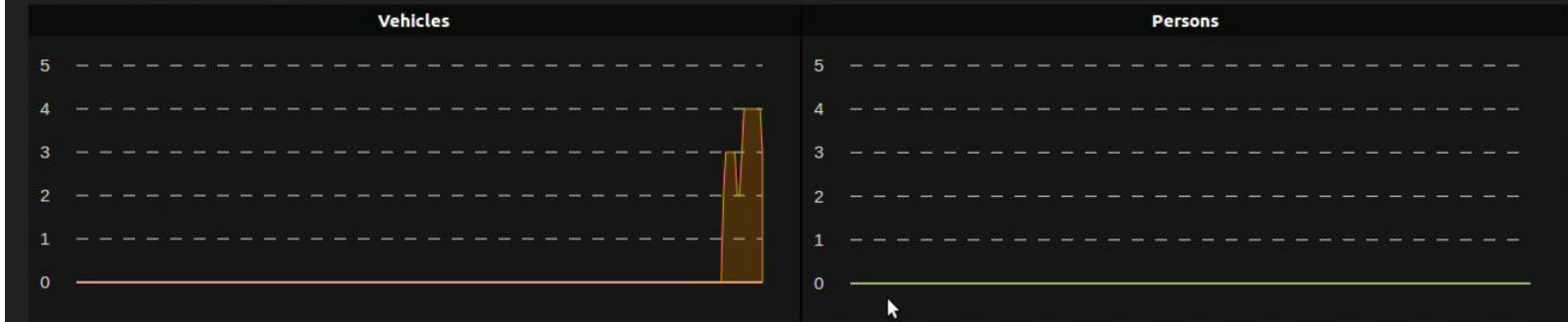
ID: 9
18:37:18
White sedan

ID: 8
18:37:17
White sedan

ID: 7
18:37:13
Grey suv

ID: 5
18:37:11
White

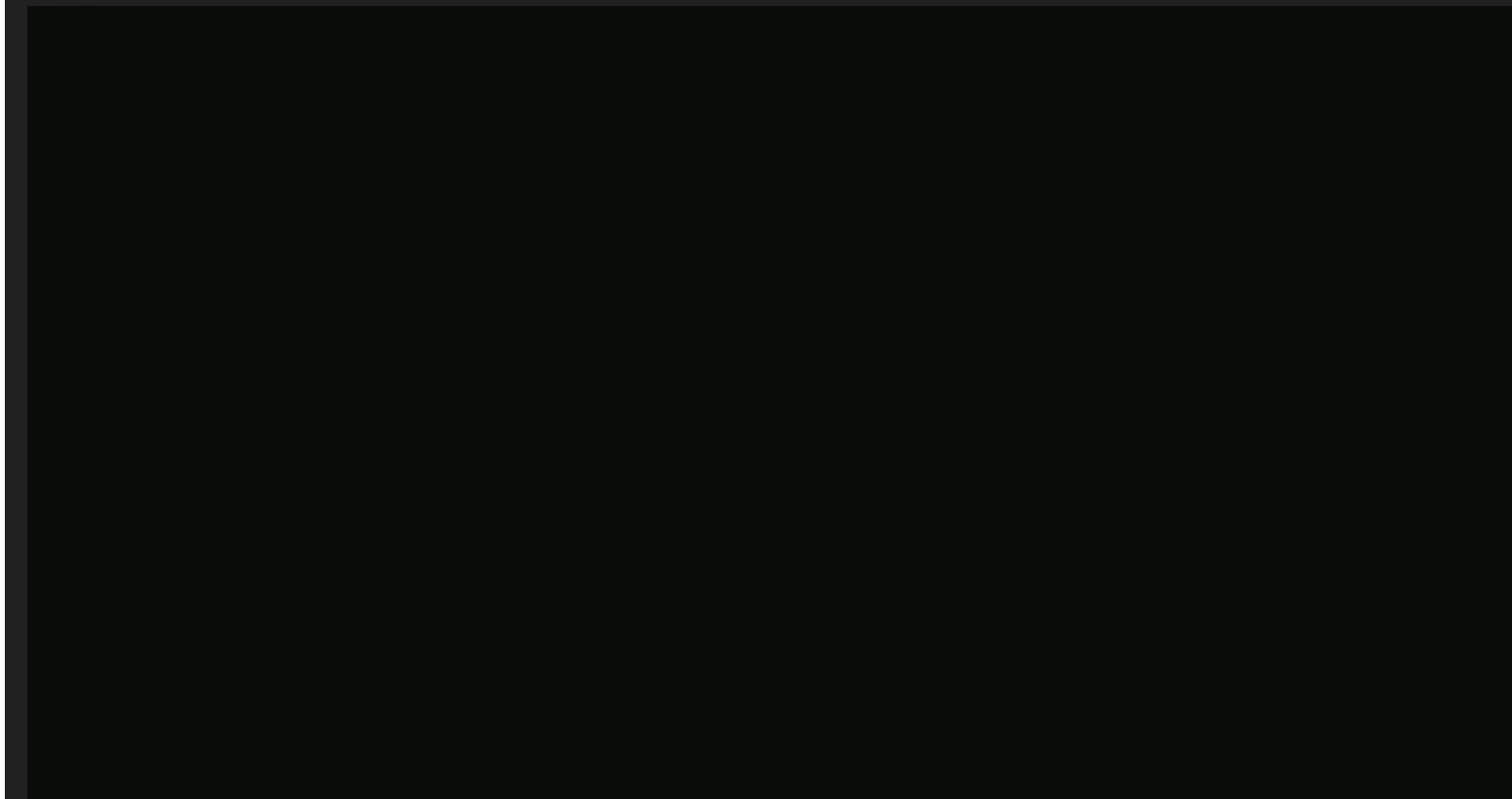
Detection Trends:



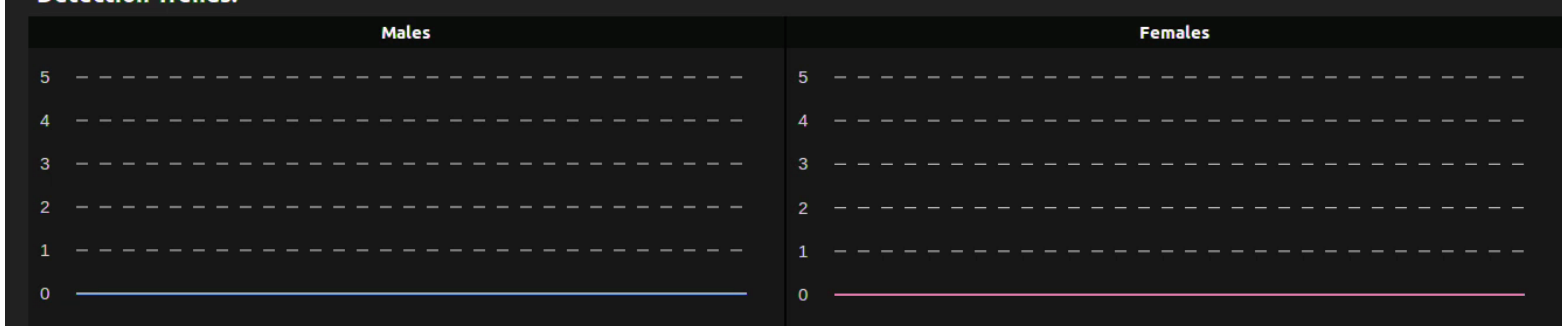
NOTE: Objects displayed are subject to a configurable detection duration

DVIDIA

Camera 1



Detection Trends:



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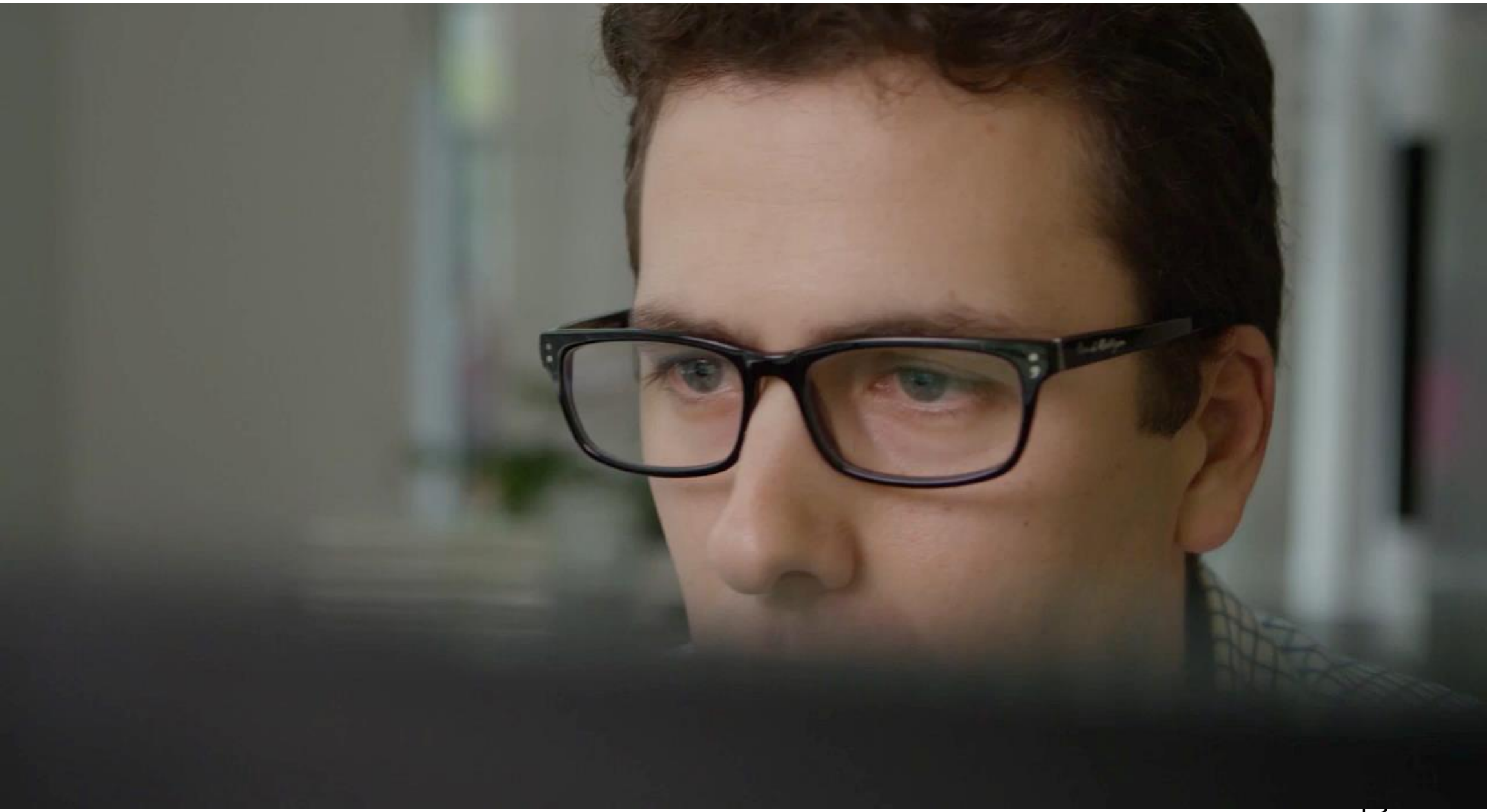
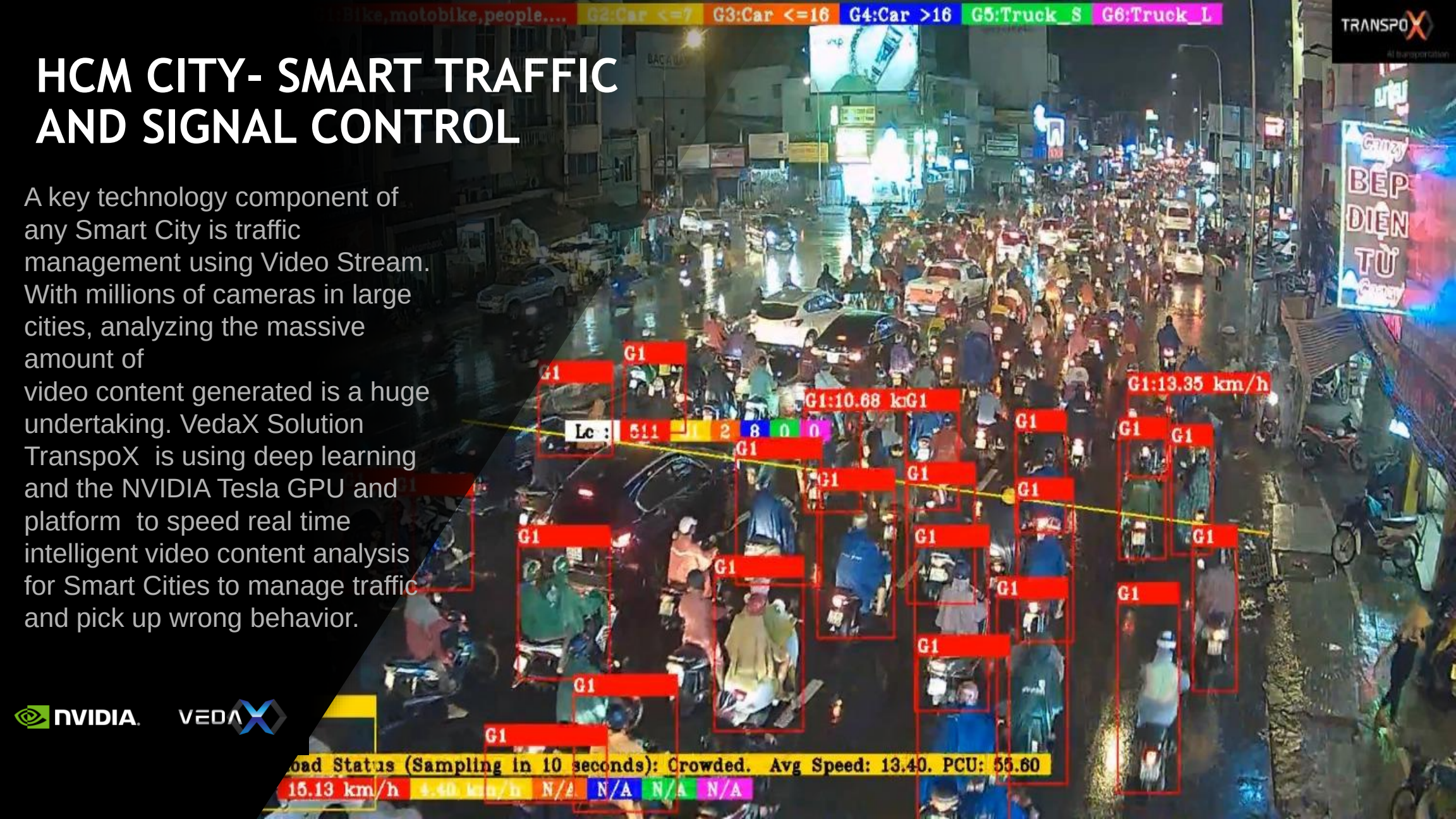
Multi-video inference
En
3:34 PM



HCM CITY- SMART TRAFFIC AND SIGNAL CONTROL

A key technology component of any Smart City is traffic management using Video Stream. With millions of cameras in large cities, analyzing the massive amount of
video content generated is a huge undertaking. VedaX Solution TranspoX is using deep learning and the NVIDIA Tesla GPU and platform to speed real time intelligent video content analysis for Smart Cities to manage traffic and pick up wrong behavior.



TOP RETAIL IVA USE CASES

$50B in annual shrinkage in US alone

LOSS PREVENTION

Ticket Switching
Mis-scanning
Sweethearting
Security

50% of top retailers will implement IVA for store analytics

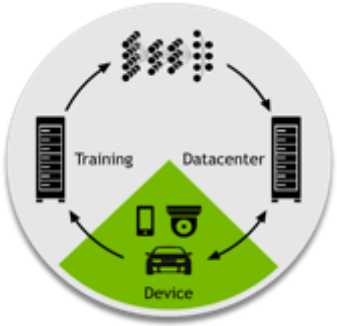
STORE ANALYTICS

Heat Mapping
Demographic Analysis
Shopper/Employee tracking
Stock Out
Customer Engagement
Price Matching
Pick-up

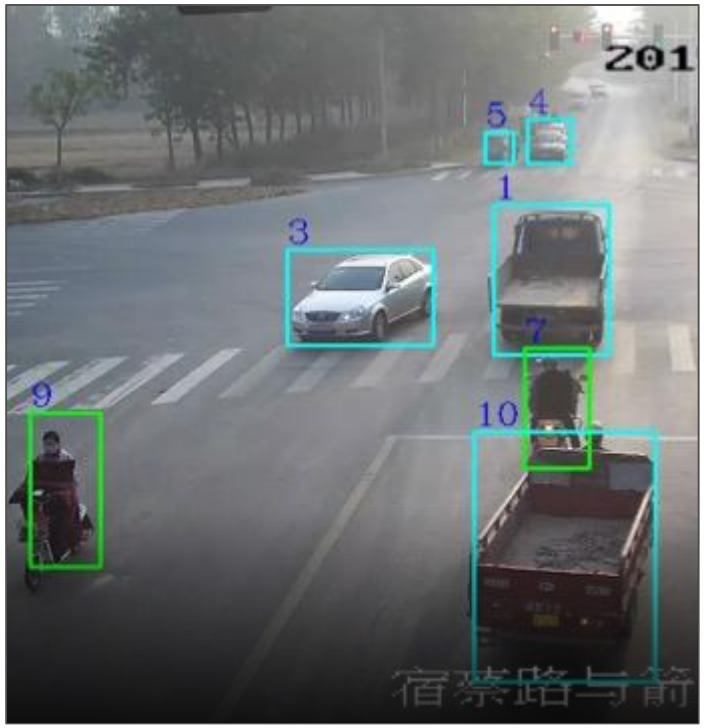
Autonomous checkout locations to increase 4x annually for next 3 years

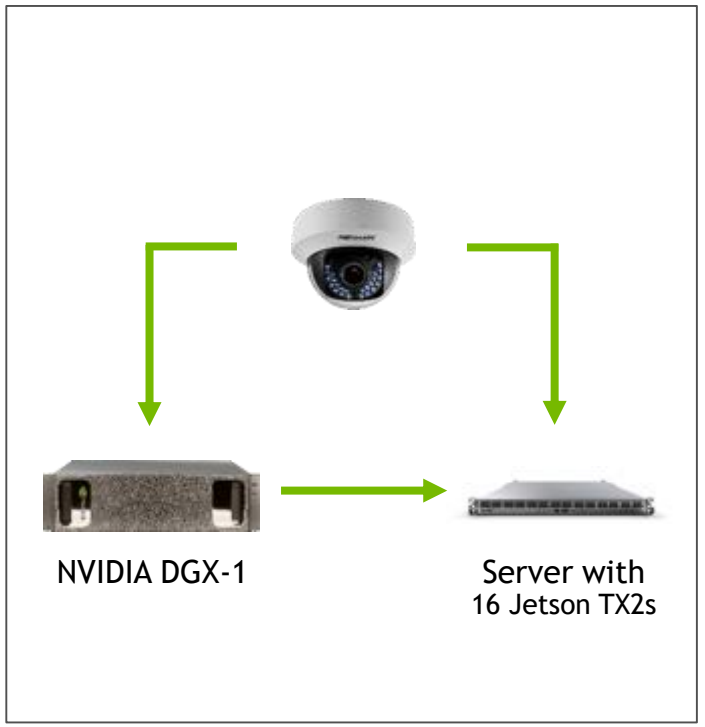
AUTONOMOUS SHOPPING

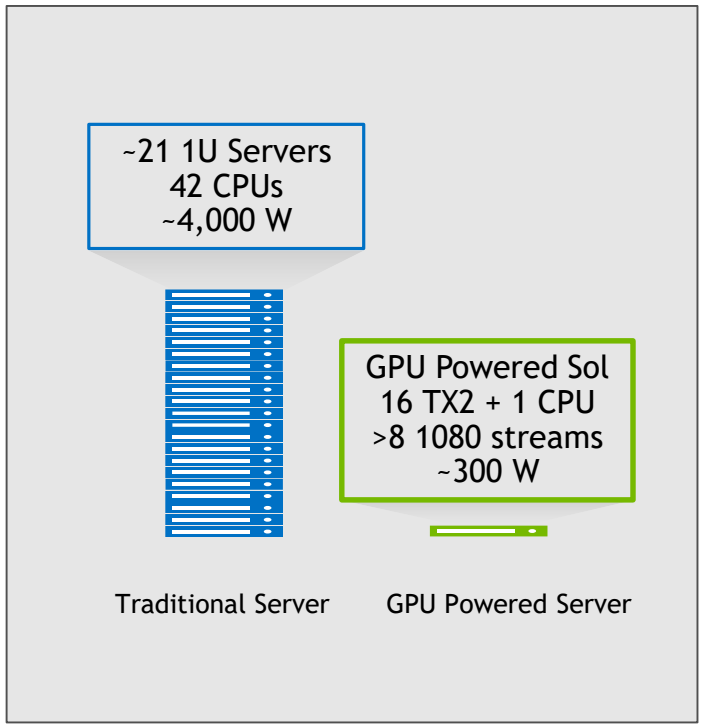
Autonomous Checkout
Nano Stores
Smart Cabinets



1/20TH THE SPACE, 1/10TH THE POWER







CREATING SMARTER, SAFER CITIES

A primary concern of policymakers and law enforcement worldwide is to safeguard citizens and property.

Powered by deep neural networks on NVIDIA DGX
systems, Tesla GPUs and Jetson, AnyVision delivers real-time recognition and analytics from surveillance video streams. With the ability to detect 115M individuals in 0.2 seconds, AnyVision looks to build
a future where cities are safer.

NVIDIA. ANYVISION.

IMPROVED INVENTORY FORECASTING

Fully stocked retail shelves are critical to retaining loyal customers, but accurate inventory forecasting is a challenging science requiring complex algorithms and massive amounts of data and compute cycles.

Use case: A mid-market retailer's legacy infrastructure was an I/O bottleneck. It took 10 minutes to pull in ~1M rows of data for 10 stores, or 1 store/minute on CPUs. Using RAPIDS with cuDF, the retailer now pulls in millions of rows of data for 6,000 stores in under 3 minutes, or 2,000 stores/minute.
A 2,000x speedup.

PREDICTING INTENT TO PURCHASE

In today's competitive business environment predictive analytics can improve a company's bottom line and provide a competitive advantage. With pre-built GPU-powered algorithms and models from H_2O.ai, Cisco's Advanced Analytics team streamlined its prediction factory.

The team now creates models in 2 days vs. 1 month—using much larger datasets—and delivers more accurate purchase predictions.

NVIDIA. H_2O.ai

cisco

INCREASE SALES, REDUCE THEFT

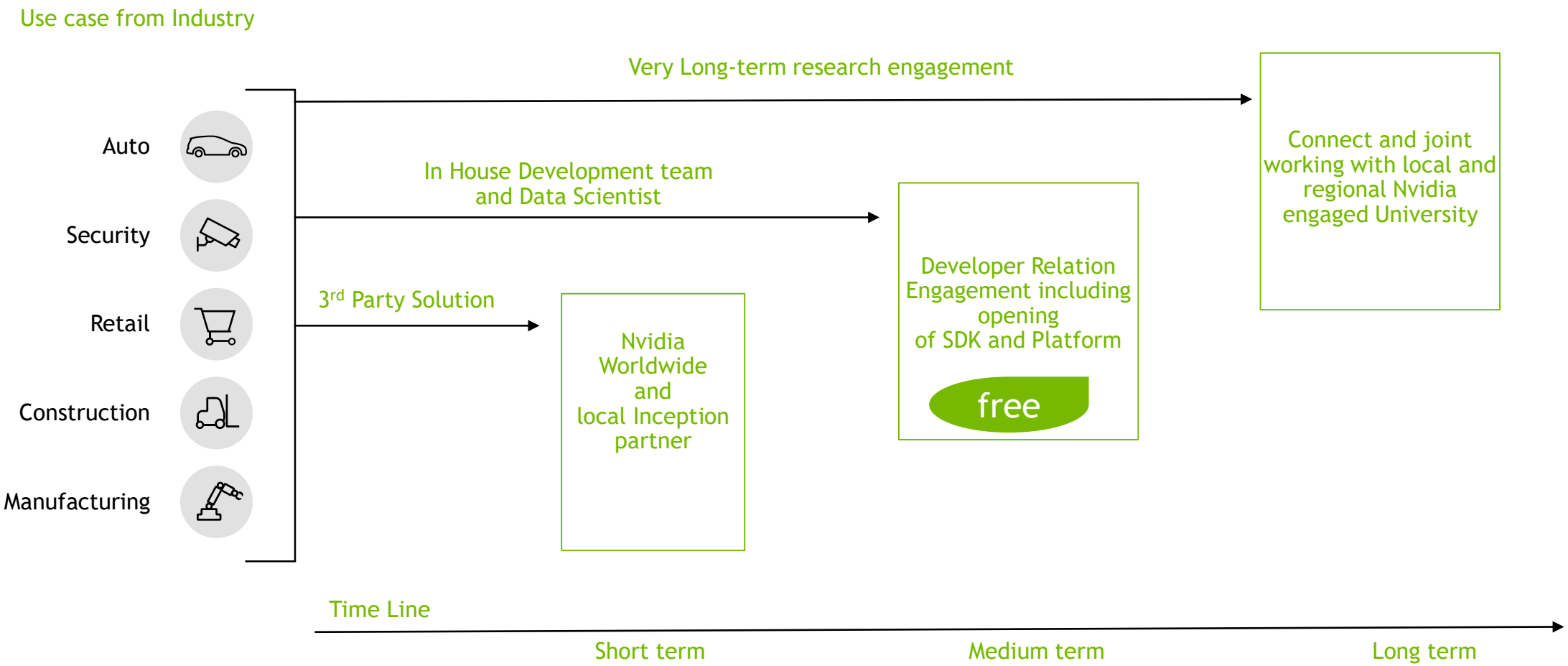
Retailers have sophisticated programs to monitor online consumer engagements but not so for in-store analytics. Additionally losses due to theft and damage were $225B U.S. in 2017 but traditional loss-prevention solutions are ineffective — and due to privacy concerns, cannot be operated in the cloud.

SkyREC uses the NVIDIA Jetson TX2 to power its AI surveillance and shopper analytics solution so its customers can monitor shopper behavior with demographics, hot spots, cold zones and dwell points. SkyREC customer Timberland reported 30% higher sales revenue due to precision marketing.

NVIDIA SKY REC

Timberland

NVIDIA COLLABORATION WITH INDUSTRY



DEEP LEARNING Workshop

Computer Vision

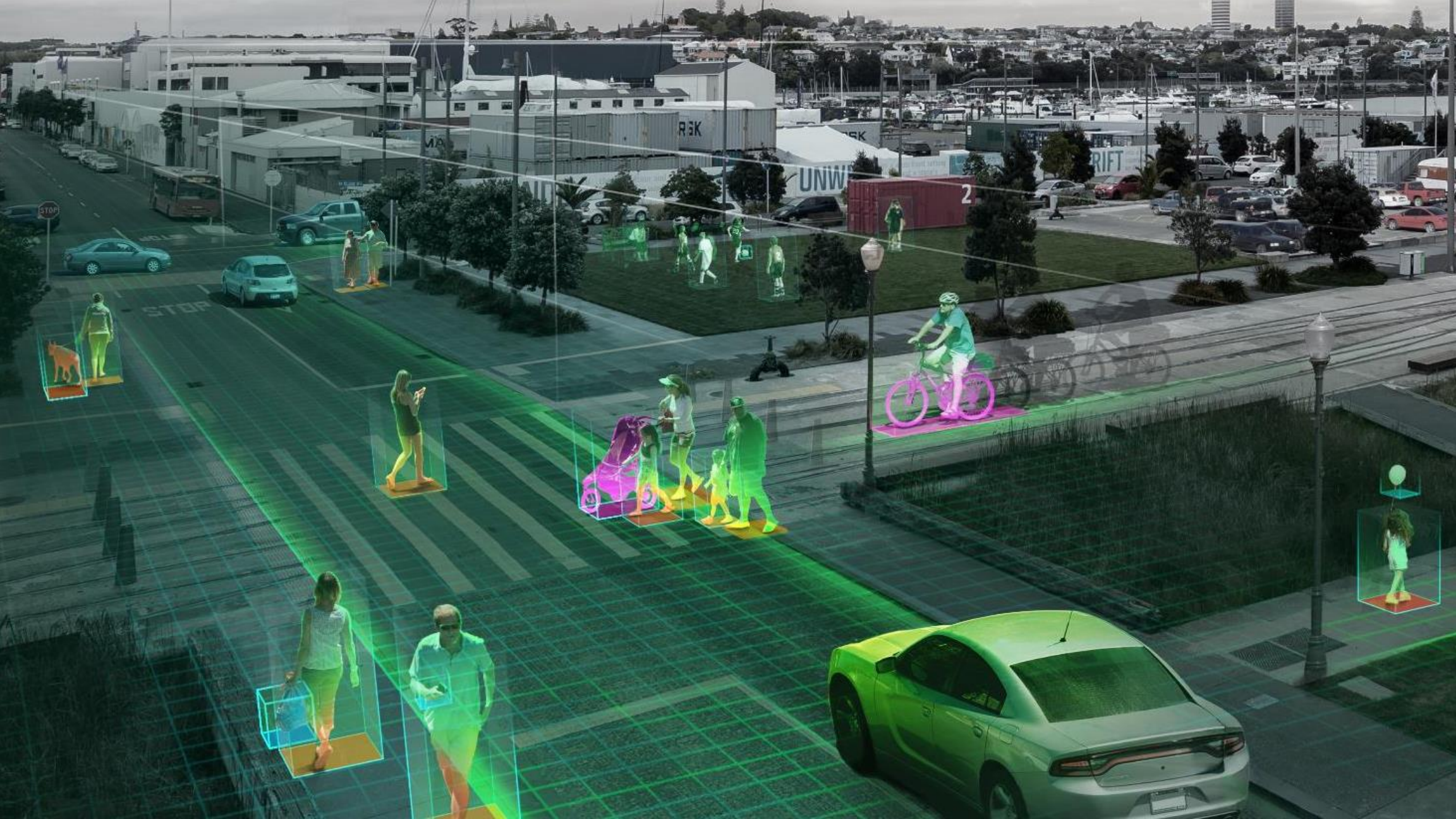
Workshop Mission: Helping Vietnam Industry Developers to solve the most challenging problems using AI and deep learning using computer vision.

When : NOVEMBER 2019

Where : Quang Trung Software City

Organizer: QTSC CTO Club, QTSC New Tech Club

More details to be shared…….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