AI — THE FOUNDATION OF THE SMART CITY

Deepu Talla | VP & GM -AUTONOMOUS MACHINES | NVIDIA AI CONFERENCE SINGAPORE 2017
RISE OF NVIDIA GPU COMPUTING

The Big Bang of Deep Learning

NVIDIA IS THE WORLD’S LEADING AI PLATFORM

ONE ARCHITECTURE — CUDA
THE WORLD’S AI PLATFORM

Every Framework

- Caffe2
- Chainer
- mxnet
- PaddlePaddle
- PyTorch
- TensorFlow
- Theano

NVIDIA Inception: 2,000 DL Startups

- Other
- IT Services
- Fin. Services
- Drones
- Manufacturing
- Automotive
- Smart City
- Healthcare

Every Cloud and Data Center

- Alibaba Cloud
- Amazon AWS
- Microsoft Azure
- Google Cloud Platform
- Intel
- Huawei
- HUAWEI
- Lenovo

NVIDIA AI PLATFORM
AI CITY
SMARTER, SAFER CITIES
1B cameras WW by 2020
Finding lost people
Improving traffic
Enhancing law enforcement
SMART AND SAFE CITIES NEED AI

1B 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

Image Classification

Accuracy

Human

Deep Learning

Hand-coded CV


2016

2020

AI CITY NEEDS AN EDGE TO CLOUD ARCHITECTURE

- Parking entrance
- Law enforcement
- Traffic management
- Airport security
- Resource optimization
- Public safety

CLOUD
ON-PREM SERVER
CAMERA

Parking entrance
Law enforcement
NVIDIA METROPOLIS — AI CITY EDGE TO CLOUD

EDGE AND ON-PREMISES

Inference

Camera
NVR
Server

CLOUD

Training and Inference

TENSORRT • DEEPSTREAM • JETPACK

JETSON
TELSA
DGX
NEW NVIDIA TENSORRT 3
Programmable Inference Accelerator

Compile and Optimize Neural Networks | Support for Every Framework
Optimize for Each Target Platform
NVIDIA DEEPPSTREAM

Sample Networks

DeepStream API

Deep Learning

TensorRT
cuDNN

Multimedia

Video Codec
SDK

Compute Graph

Bitstream
Management

CUDA, Linux

Tesla • Jetson

Developer Tools
DEEPSTREAM —
100’S OF HD VIDEO STREAMS REAL-TIME

Cameras → Decode → Detectors/Classifiers/Trackers → Composite → Encode Metadata

**TESLA P4**
- 30x HD Decode
- 30x HD Inference
- Under 60W

**Jetson TX2**
- 4x HD Decode
- 4x HD Inference
- Under 10W
DEEPSTREAM
REALTIME ANALYTICS AT SCALE

Content Filtering
Ad Injection
Parking Management
Traffic Engineering
Retail Analytics
Securing Critical Infrastructure
In-Vehicle Analytics
Law Enforcement
COMBATING TRAFFIC CONGESTION

PROBLEM
3.3 million vehicles in Shenzhen
Frequent traffic congestion
Billions of dollars of annual economic impact

SOLUTION
Realtime monitoring entire intersection
Huawei server with NVIDIA P4s
Dynamic control of traffic lights
Dynamic traffic light control with AI

IMPACT – 15% reduction in peak traffic congestion
# FINDING LOST PEOPLE

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<tr>
<th>PROBLEM</th>
<th>SOLUTION</th>
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| Elderly man wandered from home  
Potentially travelled over large area  
Must locate before dark | AI enables database search through 10x as many people  
City-wide face search |

**IMPACT** — Person located in 30 minutes and reunited with family
OPTIMIZING CITY RESOURCES

PROBLEM
High parking demand in downtown
Underutilized parking garage
No visibility into space availability

SOLUTION
AI for car in/out tracking

IMPACT — Garage utilization increased from 20% to 70%
CATCHING A DANGEROUS CRIMINAL

PROBLEM

Dangerous criminal reported by eye-witnesses
Many days of surveillance footage to analyze
Narrow window of opportunity for arrest

SOLUTION

AI-powered video synopsis and analysis

IMPACT – Suspect quickly identified and arrested
SECURING A GLOBAL EVENT

PROBLEM

Security installation for big, high-profile event
Many entrances, exits
Short setup time

SOLUTION

Dahua’s world-leading facial recognition system
AI monitoring crowd for known bad actors

IMPACT — Added equivalent capability of 100 security personal
METROPOLIS SOFTWARE PARTNER PROGRAM

The latest technology

Vetted partners and solutions

Faster time to market
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