Introduction to NEC’s Public Safety Solutions

Takehiko Akiyama
Manager, Transportation & City Infrastructure Div.
NEC Corporation

February 20th 2018
NEC brings together and integrates technology and expertise to create the ICT-enabled society of tomorrow. We collaborate closely with partners and customers around the world, orchestrating each project to ensure all its parts are fine-tuned to local needs. Every day, our innovative solutions for society contribute to greater safety, security, efficiency and equality, and enable people to live brighter lives.
Today’s Agenda

Introduction
Law Enforcement
Civil Identification
Border Control
Surveillance
Introduction – Who are we?
From Sea to Space, NEC provides all ICT-Based Social Infrastructure Solutions

Next-generation network technologies
High-performance, high-reliability core IT technologies
Diverse sensor and human interface technologies
Key Technology

Biometrics
NEC’s Fingerprint Identification Technology Ranks No.1 Again
Source: NIST Fingerprint Vendor Technology Evaluation 2015

Rank No.1 in Video Face Recognition evaluation NIST FIVE 2017

NEC’s Face Recognition Technology Ranks No. 1 for 3 Consecutive Tests
Source:
2014: NIST Face Recognition Vendor Test (FRVT) 2013
2010: NIST Multiple Biometrics Evaluation (MBE) 2010
2009: Multiple Biometric Grand Challenge (MBGC) 2009

Sterling Track Record

NEC helps governments around the world to process >1 billion unique identities i.e. >10% of world’s population

1 billion+
World’s No.1 Face Recognition Technology

1963  Start character recognition technology R&D
1989  Start face recognition R&D
       Application of pattern recognition technology established through character
       recognition R&D
2002  Commercialize face recognition SDK “NeoFace”
2009-2013 Rank No.1 in NIST**1 Evaluation
       3 consecutive wins in Still Image Matching
       2009(MBGC**2), 2010(MBE**3), 2013(FRVT**4)
2017  No.1 in NIST FIVE**5

Evaluation under various environmental conditions

2017
NIST FIVE
No.1

*1 US Institute of Standards and Technology
*2 MBGC (Multiple Biometric Grand Challenge)
*3 MBE (Multiple Biometrics Evaluation)
*4 FRVT (Face Recognition Vendor Test)
*5 FIVE (Face In Video Evaluation)
Security for international conference

- NEC participated to an event in Kenya (TICAD*) in August, 2016.
  *TICAD : Tokyo International Conference on African Development

- President Kenyatta (Kenya) and Prime Minister Abe (Japan) experienced our leading Facial Recognition technology.

- NEC deployed CCTV surveillance solution for Myanmar International Convention Center where ASEAN Summit was held in 2014.
Global Supply Record of Public Safety Solutions

Over 700 systems in 70+ countries worldwide

- 300+ systems
  Biometrics for investigation and surveillance

- 10+ systems
  Video Surveillance

- 80+ systems
  Automated Border Control
  e-Passports

- 20+ systems
  Civil ID

- 100 systems
  Critical Infrastructure Management

- 300 systems
  Inter-Agency Collaboration

- 80 systems
  Emergency & Disaster Management

- 20 systems
  Civil ID

- 10 systems
  Video Surveillance
Case Study # 1
Law Enforcement
Over 50% Of All Criminal Fingerprint Data On NEC Systems In USA

Integrated AFIS Networks
- Western Identification Network (WIN)
- Statewide AFIS Networks (CA)

Second largest criminal database – CAL DOJ uses NEC AFIS
U.S.A - LASD Project

- **End User**: Los Angeles Country Sheriff’s Department (LASD)
- **Purpose**: Criminal investigation (multi-modality)
- **Service in**: December, 2017
- **System Size**:
  - DB size: **10,000,000 records**

**Other Features**:
- IDaaS (ID as a service)
- Multi-modal capability such as fingerprint, Face and Iris.
- Successful Data conversion from other vendor
- Disaster Recovery capability
Case Study # 2

Civil Identification
India - Unique ID System

INDIA National Identification Program (AADHAAR)
To empower residents of India with a unique identity
the world’s largest biometric national ID digital platform to authenticate
anytime, anywhere

Multimodal biometrics system
Fingerprint, Face, IRIS

NEC is a supplier of choice to provide
multimodal biometrics system and service.
Enrolled database : 1.18 billion (as of Nov 2017)
Home Affairs National ID System (HANIS)

- Fingerprint based National ID system to identify South African nationals for the below purposes
  1) Immigration Control
  2) Positive Identification
  3) Passport Service
  4) Registration for Election
  5) Pension Payment Service

- Management of a large scale database of over 70 Million fingerprint data
Case Study # 3

Border Control
Deployment of NEC’s facial recognition solution for Immigration Clearance at John F. Kennedy International Airport in New York, USA.

High-accuracy matching of facial data scanned from e-Passports against live-captured images at the automated immigration clearance gate to confirm this is the same person.

System live since Jan 2016.
U.S.A - US OBIM Program

NEC tests facial recognition with U.S. Customs and Border Protection

- A fast-photo match at the gate will help expedite boarding experience while providing biometrics-based exit verification.
- Contributes to secure and efficient border management

Washington-Dulles Airport
(Identification of passengers as they board the plane)

Exit Control Terminal
(NeoFace Express)

Otay Mesa, CA
(Pedestrian Biometrics Screening)
Case Study # 4
Surveillance
Next Challenge

Issues customers are now facing
- Difficulties in continuous strict monitoring in crowded Public spaces likely to be targeted by terrorists (e.g. Train stations and airports)
  - Additional security gates cause worsening congestion
- Difficulties in prevention of various forms of serious crimes by simple watch list detection approaches (e.g. Homegrown terrorism)

After Crime        Before Crime

<table>
<thead>
<tr>
<th>Detection of suspects</th>
<th>Detection of tracking of suspicious persons</th>
<th>Prediction and Prevention of crimes</th>
</tr>
</thead>
</table>
Argentina - Tigre City

Objectives/Intention
City’s prosperity (tourism)
• “We want safe, vital, sane and healthy cities.”
• “Friendly to tourism, this is the main industry for job creation for our citizens.”

Enabler
Mayor’s initiative to introduce Command Control Center AI-IoT solutions
• License plate recognition
• Face recognition
• Behavior analysis for crime precursor
• “Inter-Agency Collaboration” IoT platform

Outcome
• 80% drop in crime rate (car theft)
• 20%/year growth of visitors and record-high in 2015
• Enhanced citizens’ trust reflected in elections
Behavior Analysis

Recognize the suspicious objects as person, vehicle or others automatically, detects and tracks the actions in real time

Wide video analytics capabilities
- People/car/object intruding a prohibited area
- People/car/object crossing predefined lines
- Left object
- Removed objects
- Crowded areas
- Speed detection
- Abnormal behaviors
- Fallen down people
- Long Time Left Object

Reduces operator’s work-load of monitoring the surveillance videos for suspicious activities.
City Surveillance Solution – how does it help?

BEFORE

- Need huge operator manpower
- Need much manual know-how/skills
- Detection/Prevention just by eye-check is difficult
- Limited processing speed

AFTER

- Operator can get Automated Alert Support
- Operator can shift to more intellectual decision and countermeasure work
- Fast processing
- Can prevent Crime/Terrorism in advance
  ⇒ Decrease of Crime/Terrorism Ratio
**India - Surat City Police, Safe City Project**

- City with a population of approximately 5 million.
- 604 cameras deployed in the city, with plans to expand to 5,000.
- 1st Safe City Project in India to use intelligent video analytic solutions.
  1. Urban Surveillance (Face recognition, license plate, vehicle speed violation)
  2. Forensic investigation (Face recognition)
- System running against a watchlist of 20,000 images to search for persons of interest.

- 150 criminal cases solved
- 27% reduction in crime rate
U.K - South Wales Facial Recognition Project

- Contributes to safe management of Champions League final in June 2017.
- Identification of criminal using Facial Recognition solution at public spaces (stadium, central city etc.) as Counter Terrorism Measures purpose.
Orchestrating a brighter world

NEC brings together and integrates technology and expertise to create the ICT-enabled society of tomorrow.

We collaborate closely with partners and customers around the world, orchestrating each project to ensure all its parts are fine-tuned to local needs. Every day, our innovative solutions for society contribute to greater safety, security, efficiency and equality, and enable people to live brighter lives.