ET City Brain

Riga | Sep. 28th. 2018
Hangzhou City Government requested Alibaba Cloud to help in solving the traffic problems.

Hangzhou City Brain program was formally announced and kicked off at the 2016 Computing Conference.

Hangzhou City Government and Alibaba Cloud announced the success of Hangzhou City Brain.

- population: 9 M
- national land area: 420 km²
- intersections: 1300
- traffic cameras: 4500
4 Main Smart Traffic Management Scenarios

Traffic Condition Perception and Optimization

Incident Detection & Actions

Violating Vehicle Tracking

Public Transportation Optimization
Traffic Light Optimization

Single Intersection Optimization

Hangzhou City Brain:

- 37000+ traffic light alerts received, real-time adjustment rate 79%
- Optimization plan update every 15 mins
- Average travel speed increased 15.3%
- Congestion rate in peak hour reduced 9.2%
- Average travel time reduced 3 mins

Holistic Optimization in Areas
Incident Detection

- 3500 traffic cameras – beyond human capability to monitor
- Spherical camera auto patrol: 360°, 24*7 hours
- Can recognize 12 types of events

2500+ events reported daily with 95% accuracy by Video Analysis in Hangzhou finish 16 hours Video within 1 minute
Tracking Down Hit-and-run Vehicles

1. Accident detection
   - South to North (10:21:59)
   - Accident Example
   - License plate: 浙AD03** (Input Image)

2. Hit-and-run tracking
   - South to North (10:47:16)
   - South to North (10:46:06)
   - West to East (10:44:08)
   - North to South (10:38:42)
   - North to South (10:33:42)
   - North to South (10:34:48)
   - North to South (10:37:09)
Bus Route and Schedule Optimization

+17% more passengers
Smart Traffic Public Information Dashboard
One Platform for More

- **Police**
  - Activities Security
  - Accidents Prevent

- **Traffic**
  - OD Pattern, Crowds Density
  - Vehicle Profile & GPS
  - Traffic Condition Perception & Prediction
  - Police Command Workflow
  - Public Transportation Schedule & Route

- **Airport / Subway**
  - Operation Scheduling
  - Retention & Evacuation

- **City Administration**
  - Smart Parking
  - Truck Management

- **Tourism**
  - Spots Crowds Alerts
  - Shuttle Scheduling

the data resource and computing abilities could be expanded to other domains of the city.
### Prerequisites

**Vehicle Trajectory**
- Navigator GPS
- Car Plate Recognition Trajectory
- Taxi/Bus GPS

**Sensor / Light**
- Microwave
- Loop
- Radar
- Traffic Light Timing

**Camera**
- Spherical Camera
- Traffic Camera

**Map**
- Map Tiles
- Road Network

**Telecom Operation Company**
- Base Station Location
- Cell Phone Signaling
City Brain Deliverables

City Brain Application
User Interaction & Interface

Algorithm & Data Warehouse -> Implemented on the Platform

City Brain Data Warehouse
Managed by Data Resources Platform

Video/Structured Data Algorithm
Packed in the Algorithm Platform

IaaS & PaaS -> On-Premise Cloud

Data Resources Platform
Data Development & Management Tools

City Brain Algorithm Platform
Algorithm Development & Management Tools

Video Analysis Platform
Video Access & Management Tools

Cloud & Big Data Infrastructure
Storage / Compute Engine / Network...
City Brain Delivery Process

1. Define the range of trail area
2. Investigate and understand current system
3. Estimate resource capacity
4. Deploy On-Premise cloud
5. Migrate data
   - Access video stream
6. Implement data model
   - Implement algorithm
   - Implement app
7. Customize and integrate system
   - Launch

Total 6-12 Months
Our Reference of City Brain
Paldies!