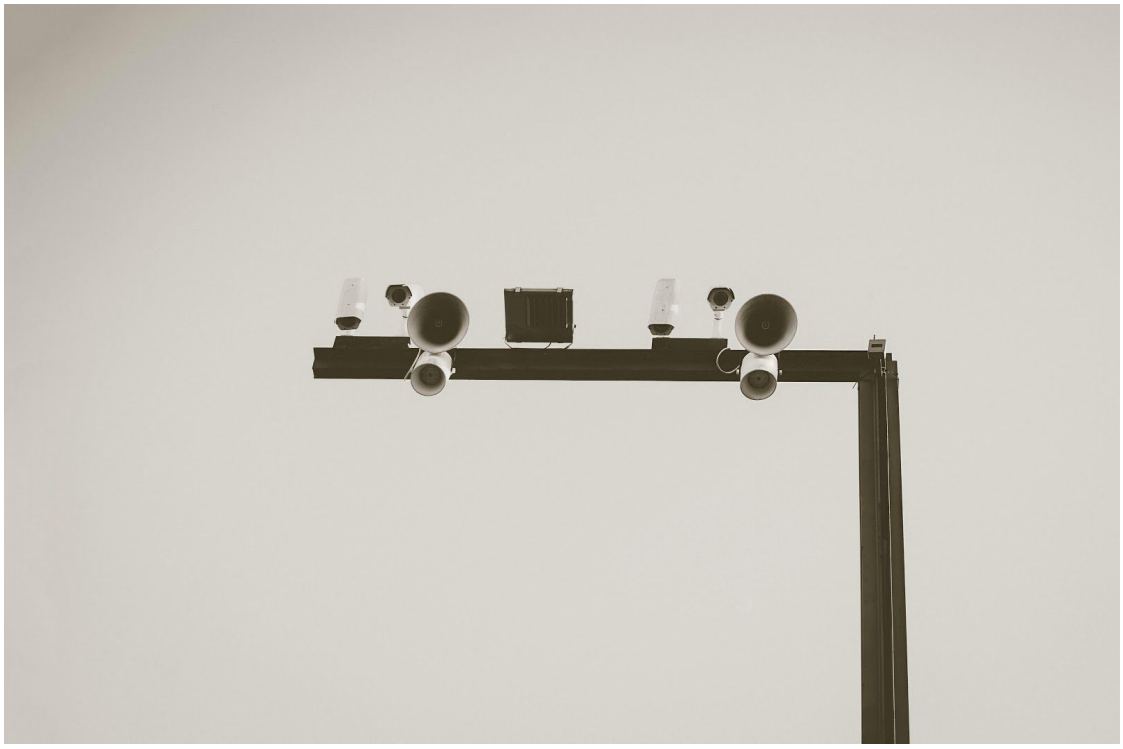
Uncanny Vision®

Eyes on the Road: Uncanny Vision's AI monitors the highway for violations

Edge AI-based ANPR System for Vehicle Surveillance



Uncanny Vision Solutions Pvt Ltd

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CHALLENGE

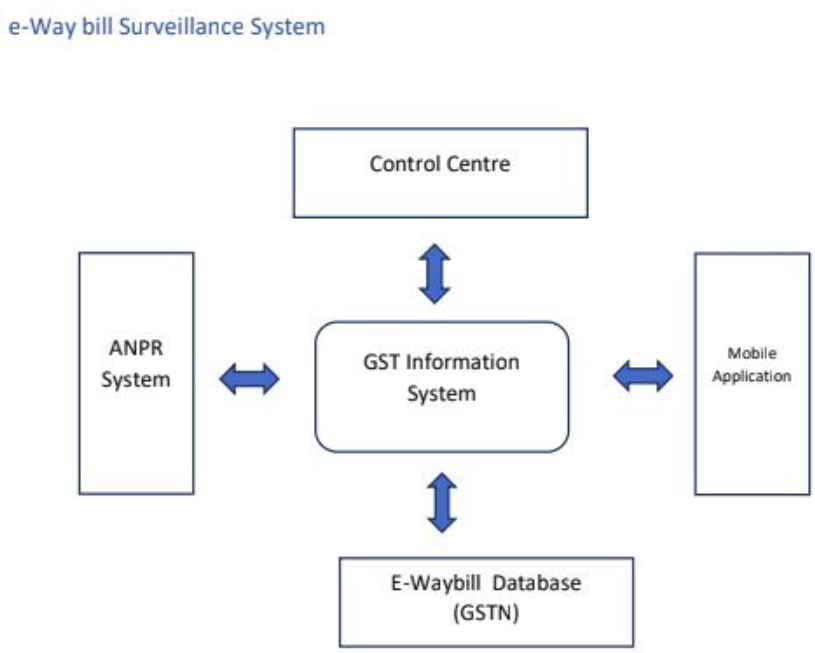
The State Goods and Services Tax Department is a major revenue generating department under the Government of Kerala currently administering Goods and Services Tax Act, Kerala General Sales Tax Act, Kerala Money Lenders Act and Agriculture Income Tax Acts. The Department had established assessment circles, Intelligence offices and squads, Appeal offices, Law offices, and offices across the state for tax administration.

Consequent to the rollout of Goods and Services Tax (GST) in the Country from 1st July 2017 onwards, the Commercial Taxes check posts established during the Value Added Tax period had been abolished which was the major surveillance system for monitoring the flow of taxable goods across the Kerala state borders. In GST e-Waybill has been mandated for all movements of taxable goods.

e-Waybill is a self-declared document downloaded by consignor or transporter which is to accompany the goods transport vehicle. Since check posts are non-existing in GST, the Government had decided to implement video based Smart/Intelligent Surveillance system to track the e-Waybill based transactions happening across the border areas of the State. Based on the decision, the SGST Department proposes to implement an intelligent ANPR surveillance system to capture the vehicle number, image and vehicle category for integrating with the Department backend system.

SOLUTION

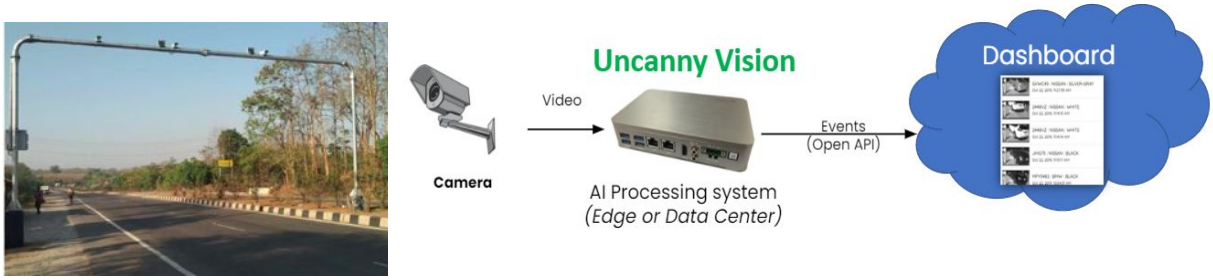
Uncanny Vision's goods vehicle tracking system uses video-based vehicle detection and classification technology, bundled with ANPR. The system automatically classifies the vehicles scanned and classifies the same as goods vehicles (Mini Truck & Truck) and Passenger Vehicle (Car, bus. Auto, bike, Suv). The system uses Artificial Intelligence based technology for vehicle classification and for number plate recognition enabling it to provide very high accuracy. The system on field has an evidence camera for evidence of vehicle movement, ANPR camera (one camera per lane) and ground hardware with all processing units.



The length of the vehicles is not used for classification ensuring a Tata Ace to be considered as Mini-Truck against a normal car and a Bolero Truck is considered as a Mini Truck against an SUV.

All the processing is performed at the ground hardware and only number plate data is sent to the command center for verification to ensure the data reaches the squad well in time to stop the vehicle. One the vehicle is categorised and number plate is captured, the system cross verify the number plate data with the e-waybill portal and if found not found or find a discrepancy, the event is triggered and data is sent to the squad on the road with evidence to stop the vehicle for manual verification.

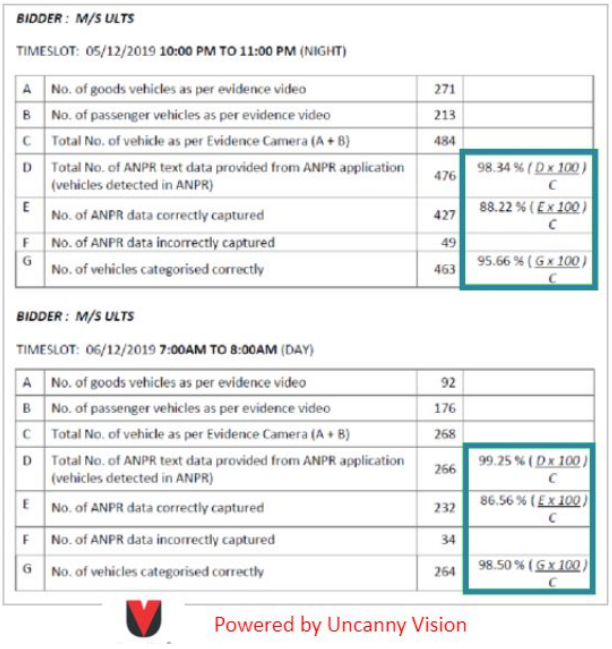
ARCHITECTURE:



WHY NUMBER PLATE RECOGNITION IS HARD?

Samples of Number plates:

GOVT PoC REPORT: UV vs COMPETITION:



BIDDER : M/S ULTS

TIMESLOT: 05/12/2019 **10:00 PM TO 11:00 PM** (NIGHT)

A	No. of goods vehicles as per evidence video	271	
B	No. of passenger vehicles as per evidence video	213	
C	Total No. of vehicle as per Evidence Camera (A + B)	484	
D	Total No. of ANPR text data provided from ANPR application (vehicles detected in ANPR)	476	98.34 % (D x 100) / C
E	No. of ANPR data correctly captured	427	88.22 % (E x 100) / C
F	No. of ANPR data incorrectly captured	49	
G	No. of vehicles categorised correctly	463	95.66 % (G x 100) / C

BIDDER : M/S ULTS

TIMESLOT: 06/12/2019 **7:00AM TO 8:00AM** (DAY)

A	No. of goods vehicles as per evidence video	92	
B	No. of passenger vehicles as per evidence video	176	
C	Total No. of vehicle as per Evidence Camera (A + B)	268	
D	Total No. of ANPR text data provided from ANPR application (vehicles detected in ANPR)	266	99.25 % (D x 100) / C
E	No. of ANPR data correctly captured	232	86.56 % (E x 100) / C
F	No. of ANPR data incorrectly captured	34	
G	No. of vehicles categorised correctly	264	98.50 % (G x 100) / C

Powered by Uncanny Vision

BIDDER : M/S CDIT

TIMESLOT: 06/12/2019 **10:00 PM TO 11:00 PM** (NIGHT)

A	No. of goods vehicles as per evidence video	271	
B	No. of passenger vehicles as per evidence video	270	
C	Total No. of vehicle as per Evidence Camera (A + B)	541	
D	Total No. of ANPR text data provided from ANPR application (vehicles detected in ANPR) after excluding duplication	165	30.49 % (D x 100) / C
E	No. of ANPR data correctly captured	76	14.04 % (E x 100) / C
F	No. of ANPR data incorrectly captured	89	
G	No. of vehicles categorised correctly	59	10.90 % (G x 100) / C

BIDDER : M/S CDIT

TIMESLOT: 07/12/2019 **7:00AM TO 8:00AM** (DAY)

A	No. of goods vehicles as per evidence video	120	
B	No. of passenger vehicles as per evidence video	331	
C	Total No. of vehicle as per Evidence Camera (A + B)	451	
D	Total No. of ANPR text data provided from ANPR application (vehicles detected in ANPR) after excluding duplication	242	53.65 % (D x 100) / C
E	No. of ANPR data correctly captured	136	30.15 % (E x 100) / C
F	No. of ANPR data incorrectly captured	106	
G	No. of vehicles categorised correctly	151	33.48 % (G x 100) / C

Powered by Biggest Chinese Camera Manufacturer

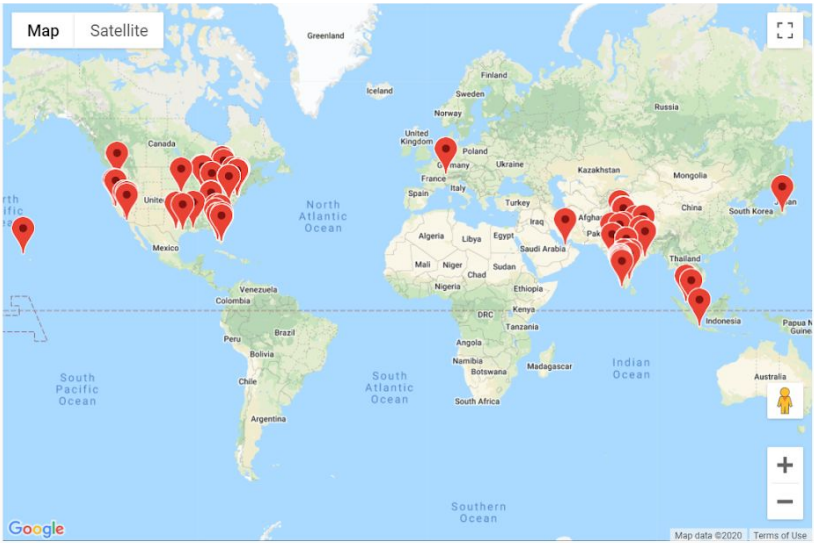
RESULTS

The system provides tracking on goods vehicles and provides insights on its movement.

1. Pilferage Control - Below are the two types of Pilferage in our understanding.
    a. Vehicle without E-Waybill - The system detect the vehicle entering the state without a GST Number
    b. Multiple Trip with same E-Waybill - As per the current system they can take multiple trips with the same E-Way bill as it has not been monitored or stamped on entry. The system counts the trip and then can alert if multiple trip is seen
2. Security - Even Though invested by the state GST Department, the system can be used by other departments to get the data from cameras. The system gives automatic alert for pilferage detection but also does ANPR for all vehicles and the many times the data from these cameras has helped in crime analysis.

About Uncanny Vision

Uncanny Vision is an award-winning AI-based Computer Vision company delivering next generation real-time Edge-based Video Analytics solutions for Smart Cities, Smart Buildings, Smart Parking & Smart Infrastructure – specifically for People & Vehicle Monitoring using cameras. We enable cameras to "see" and "understand" their environment instantly using AI/Deep Learning algorithms. Core solutions include People, Vehicle count, classification as well as high accuracy License Plate Recognition used by many cities around the world. Using unique optimization techniques, Uncanny Vision provides this solution on low-cost Edge AI processing systems powered by Intel and on high performance Data Center or Cloud systems powered by Nvidia.



Our current deployments

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Our Products

Uncanny ANPR
Uncanny Vehicam
Uncanny Shield