# Contents

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# About us

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# CHANGING  THE
## DNA OF SURVEILLANCE

Lookman has been in the business of bringing you peace of mind,
for over 35 years. Established by Dr. Saifuddin Bharmal, a pioneer in
the Indian surveillance industry, Lookman has grown to become one of
the leading surveillance solution providers in India.

In the year 2004, we launched Secura, our own range of cutting-edge surveillance
products. We distribute Secura surveillance systems through a widespread network of
dealers across India.

Over the years, we have earned a reputation for offering world-class products backed
by top-notch technical support and after-sales service.

What brings us greater pride is our diverse portfolio of clients, ranging from high-
profile government and public sector departments to numerous private sector clients
and homeowners. When it comes to security, Lookman is the name that the country
looks up to.
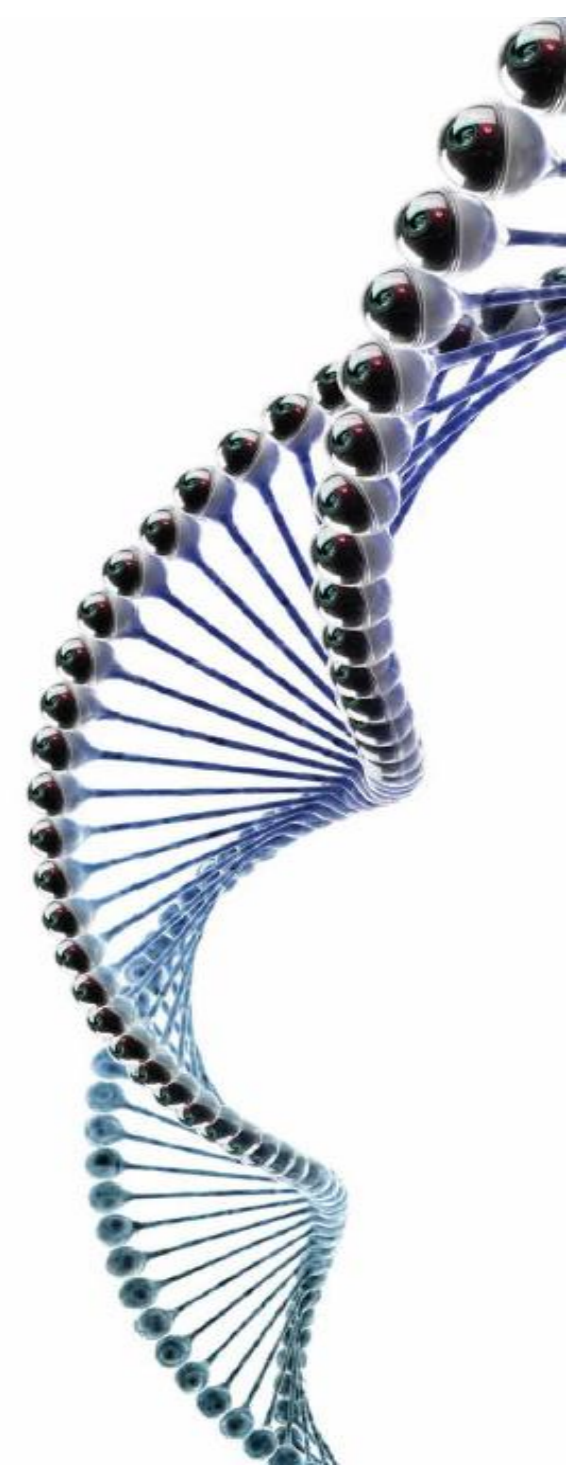
# Our Acheivements

Industry leaders in smart city segment in India
- Largest State deployment
- Largest Single order City deployment
- Largest ANPR and RLVD project

Award winning software suites
- Best accuracy for Indian Plates
- Most innovative solution for E-Challan

Pioneers
- Longest presence in CCTV field in India
- First A.I based large scale deployment for CCTV

IIVASS
THE MOST
INNOVATIVE
PRODUCT OF
THE YEAR IN
SECURITY

# RECENT PROJECTS

Completed:
- ➢ Ahmedabad Smart city (6500 IP cameras)
- ➢ Rajasthan 7 cities surveillance (2200 IP cameras)
- ➢ Tamil Nadu police (308 police stations, 1848 IP cameras)
- ➢ Reserve Bank of India (6 locations, 800+ IP cameras)
- ➢ Mumbai city police (25 police stations)
- ➢ Street surveillance for New Delhi Municipal Corporation (1500+ IP cameras)

Recently awarded:
- ➢ Rajasthan 20 cities rate contract (20000+ IP cameras)
- ➢ Karnataka State Police (770+ Police stations, 3000+ IP cameras)
- ➢ Rajasthan state rate contract (650 Body worn cameras)

# Areas of coverage

What is A.I and where is it in deployment?

A.I and Surveillance for a Smart City

Understanding Limitations and setting expectations

Established results with power of A.I

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# What is A.I and Where is it in deployment

## Where we see AI in action already

Human vs Computer Games

Navigation System

Chatbots

Siri / Cortana

Drones

Self Driving Cars

Alexa

Netflix/YouTube video recommendation

Many more
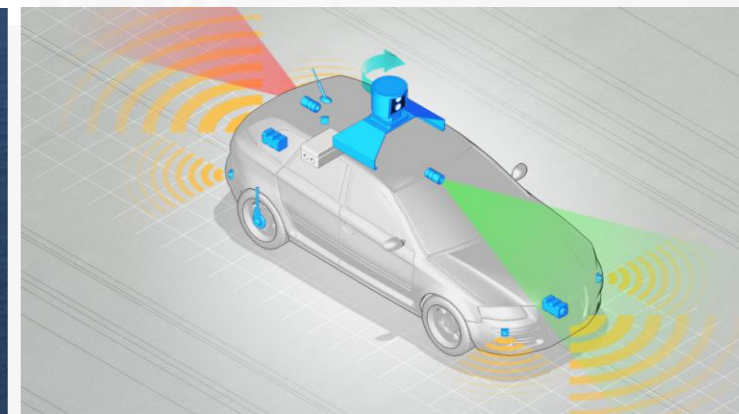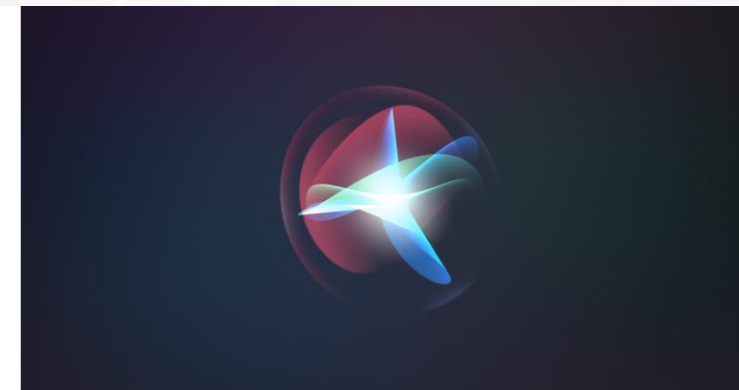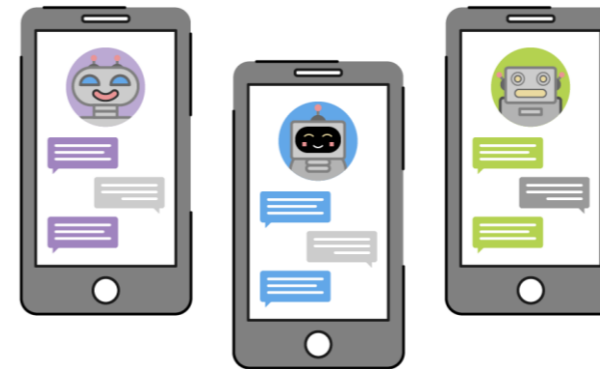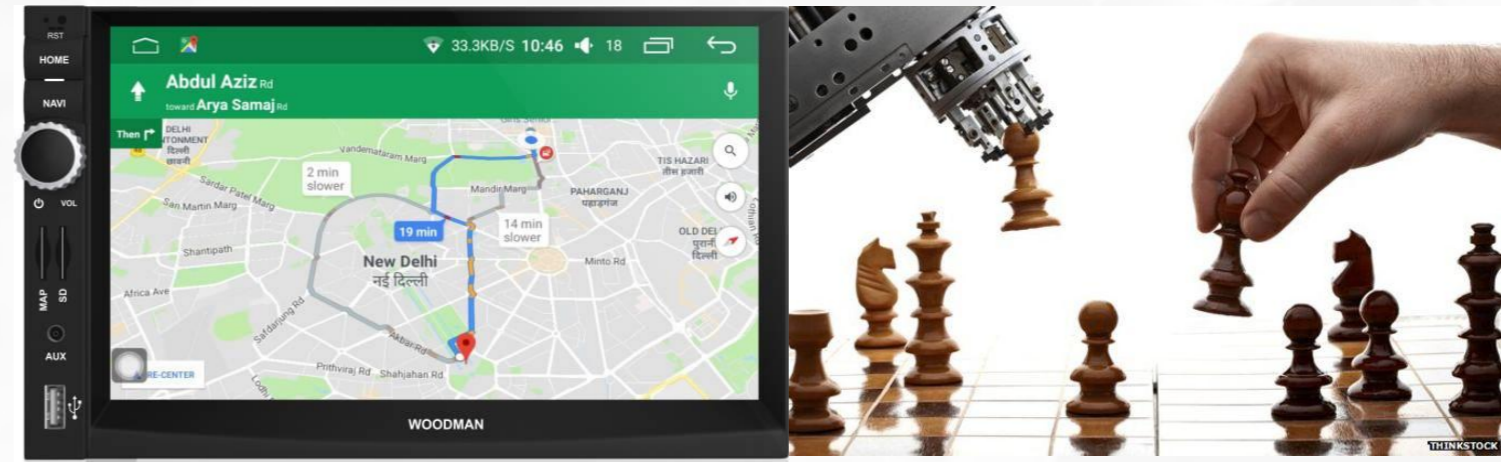
# What is Artificial Intelligence?

**ARTIFICIAL INTELLIGENCE** *is the discipline that you apply when you want to know what to do, when you don't know what to do.*

It is about creating machines that were themselves as smart as humans. And along the way the field diverged into different school of thoughts, including cognitive system which is focused on thinking like humans and Machine learning, which is focused on creating machines that act autonomously in general, regardless of whether or not they are thinking like humans do

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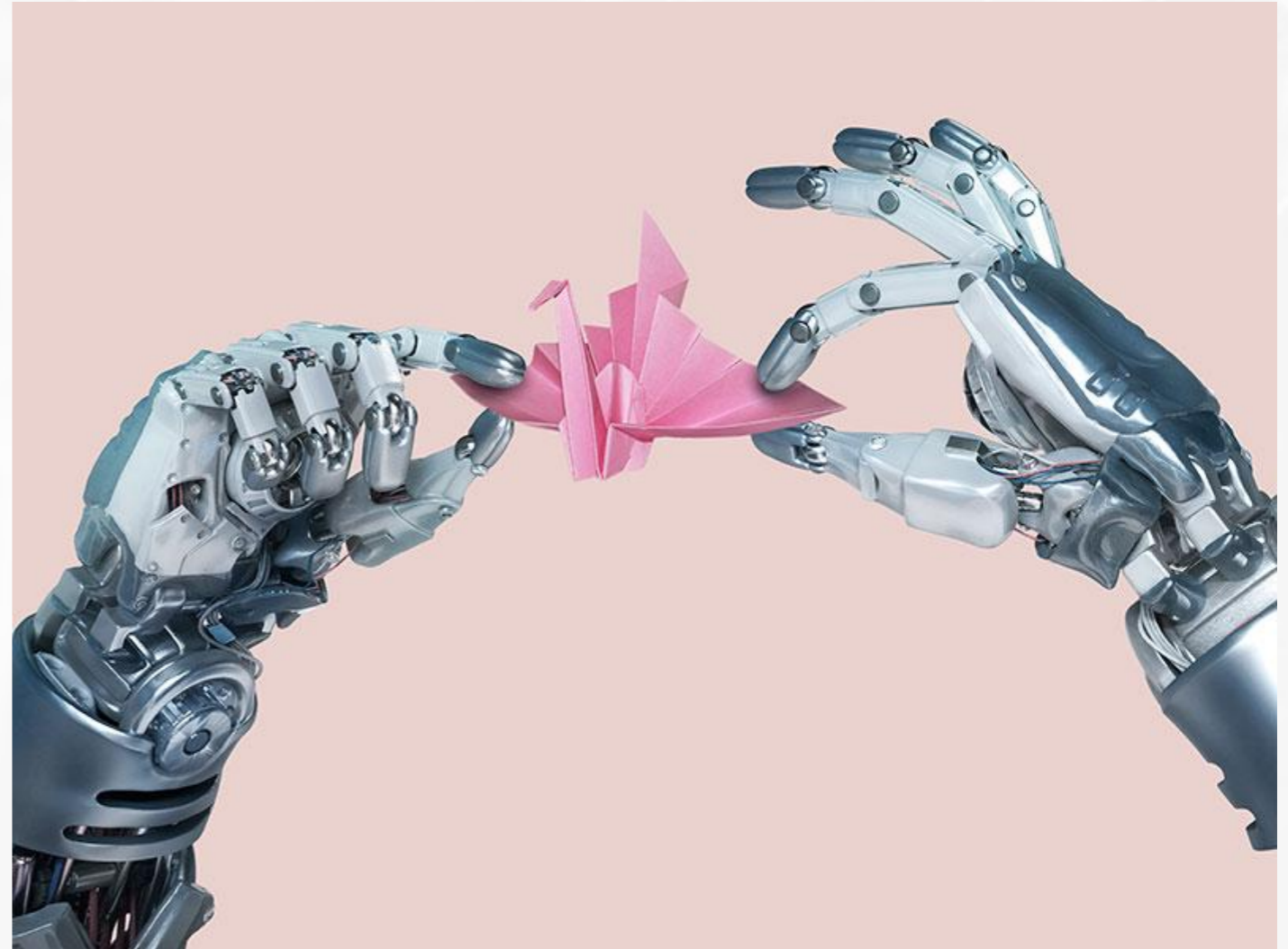
# What is Machine Learning (ML)?

**HUMANS** *learns from experiences,* **COMPUTERS** *need to be told what to do, they need to be programmed.*

*Now the question is, can we get computers to learn from past experiences too? And the answer is yes we can.*

*Teaching computers to learn to perform tasks from past experiences is precisely what Machine Learning is.*
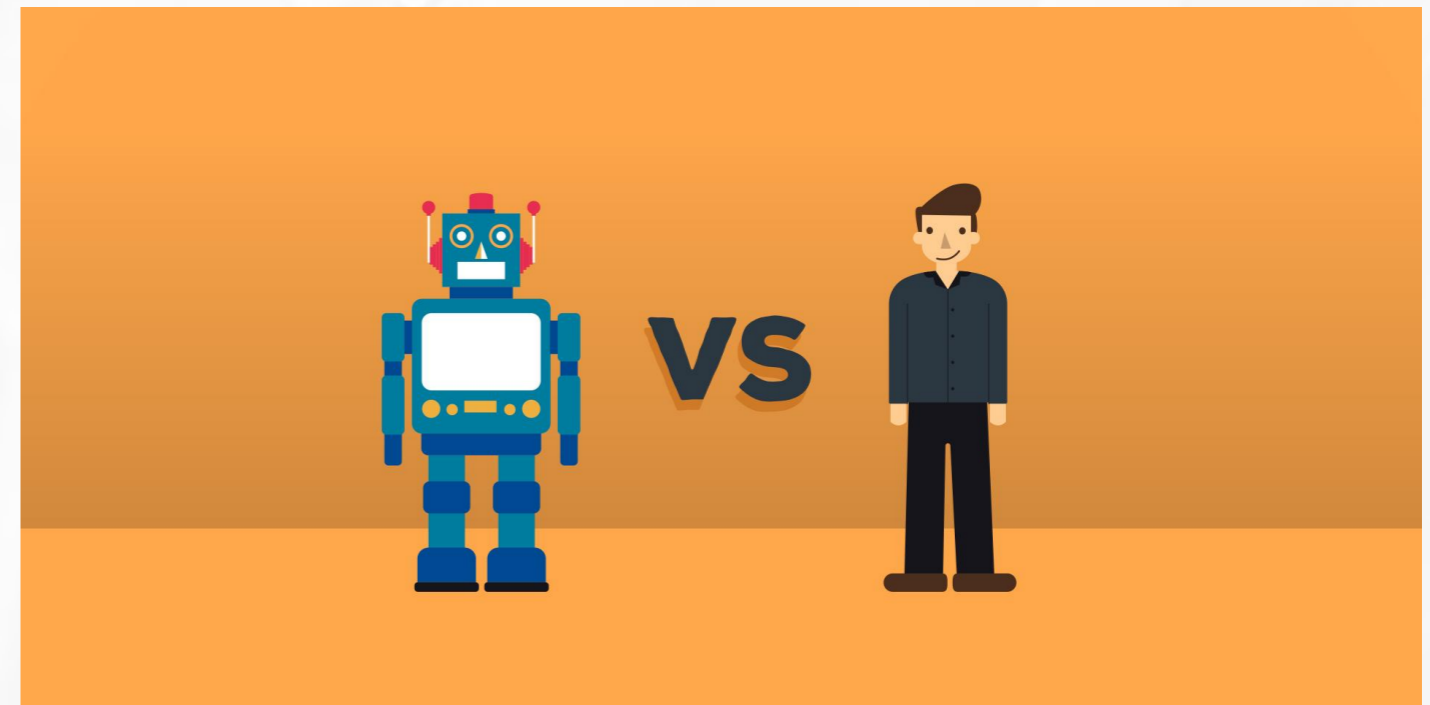
# What is Deep Learning?

**Deep Learning** *is a branch of Machine Learning that uses data,  to teach computers how to do things only humans were capable of doing before.*

*Like solving problems of perception, recognizing what's in an image, what people are saying when they are talking, helping robots explore the world and interact with it. Deep Learning has emerged as a central tool to solve perception problems.*

*It's state of the art having to do with Computer Vision and Speech Recognition.*

*Increasingly people are finding this is much better tool to solve problems like discovering new medicines, understanding natural language and documents,*

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# What is A.I and Where is it in deployment

## AI  >  Machine Learning  >  Deep Learning

**ARTIFICIAL INTELLIGENCE** is study of agents that perceive the environment around them, form plans and define a course of action, and make decisions to maximize their goals. *In short mimic Human Behaviour.*

**MACHINE LEARNING** being a subset of *AI,* a machine is taught to complete certain tasks without explicitly programmed to do so.

**DEEP LEARNING** is a subset of machine learning, consecutive layers, created and organized by breaking down tasks onto machine learning algorithms. Each layer stacks on previous layer's output. Jointly they mimic a human brain's distributed way of problem solving.

**ARTIFICIAL INTELLIGENCE**

**MACHINE LEARNING**

**DEEP LEARNING**

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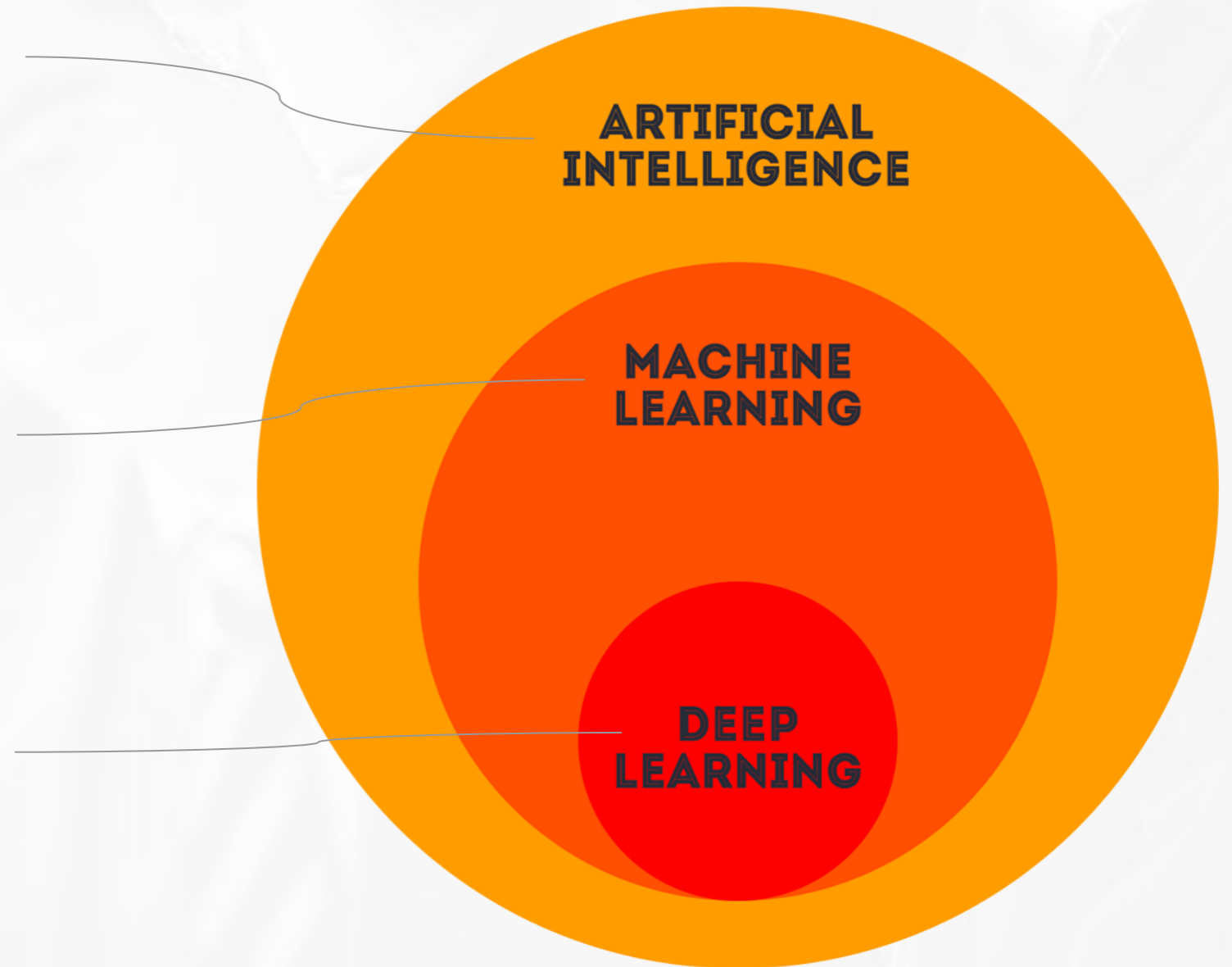
# Deep Learning VS Computer Vision

Deep learning has repeatedly demonstrated its superior performance on a wide variety of tasks including speech, natural language, vision, and playing games

Based on situations, advantages and performance, the choice between them becomes clear:

**DL > CV**

- Best-in-class performance

- Effectively scales with larger data

- Adaptive and transferable

**CV > DL**

- Works better on small data

- Easier to understand

- Computationally cheap

### Deep Learning vs Computer Vision

*Accuracy* (y-axis: 0, 25, 50, 75, 100)

*AMOUNT OF DATA* (x-axis)

Legend: CV, DL

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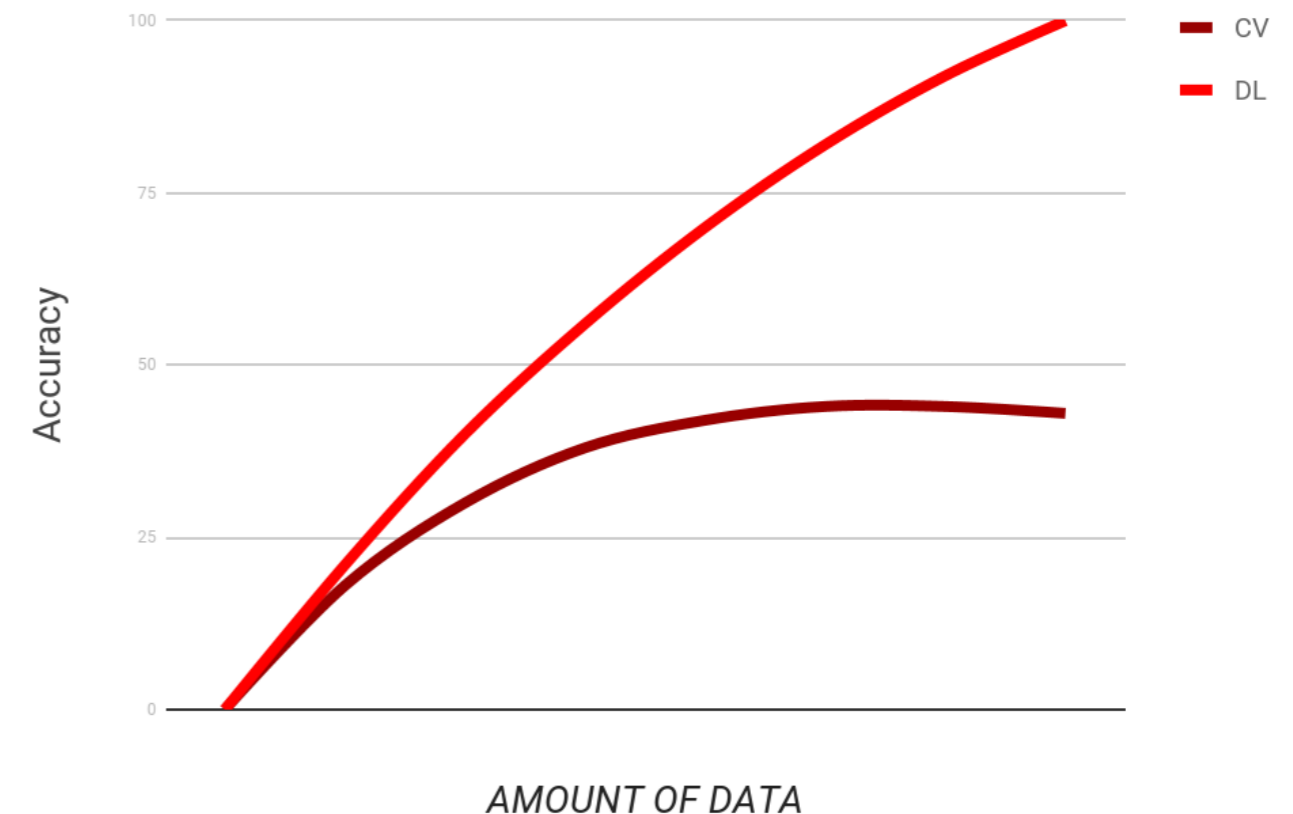
# Why AI based Surveillance?

*Manual Surveillance is costly, time consuming, error prone and frankly impossible.*

*Conventional analytics serve little purpose in actual deployments, they create nuisance from their limited logics and accuracy*

***AI based surveillance provides:***

*More precision and accuracy than humans in many cases*

*Significant reduction in false negatives – paving way for automated actions*

*Deployment of technologies such as object, event and facial recognition*

*Clearly distinguishes between different objects: Person, vehicles, animals, etc.*

A.I and Surveillance for Smart cities

# AUTOMATIC NUMBER PLATE RECOGNITION and Violation processing

A robust AI engine deeply trained to accurately detect, recognize a license plate that works with a variety of non standard formats as well.

An Intelligent system to automatically process challans wherever reads are deemed appropriate, reducing significant time and maximising coverage

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# Helmet Violation

Simultaneously identifying person not wearing helmet and it's vehicle license plate, even if the person is on the back seat.

This AI, using deep learning methods is also able to identify 'Triple Riding Violations'.

# Smart Parking and Smart Anti-Hawking

Hawking Detection analytics is capable of detecting an illegally parked Hawking station out of the designated area. Resulting in much safer traffic.

Using neural networks + network of cameras to solve a simple yet complex parking problem across your whole campus, while also extracting various vehicle features (make, model, color, etc)

# A.I and Surveillance for Smart cities

## Object Recognition

Robust Object Detection AI, working in different outdoor-indoor environments identifying currently up to 124 objects, their locations and tracking in real-time.

Be it Person, Animal, Vehicles, Office objects, etc. This can be used to collect millions of metadata, while the system keeps learning own it's own using deep learning.
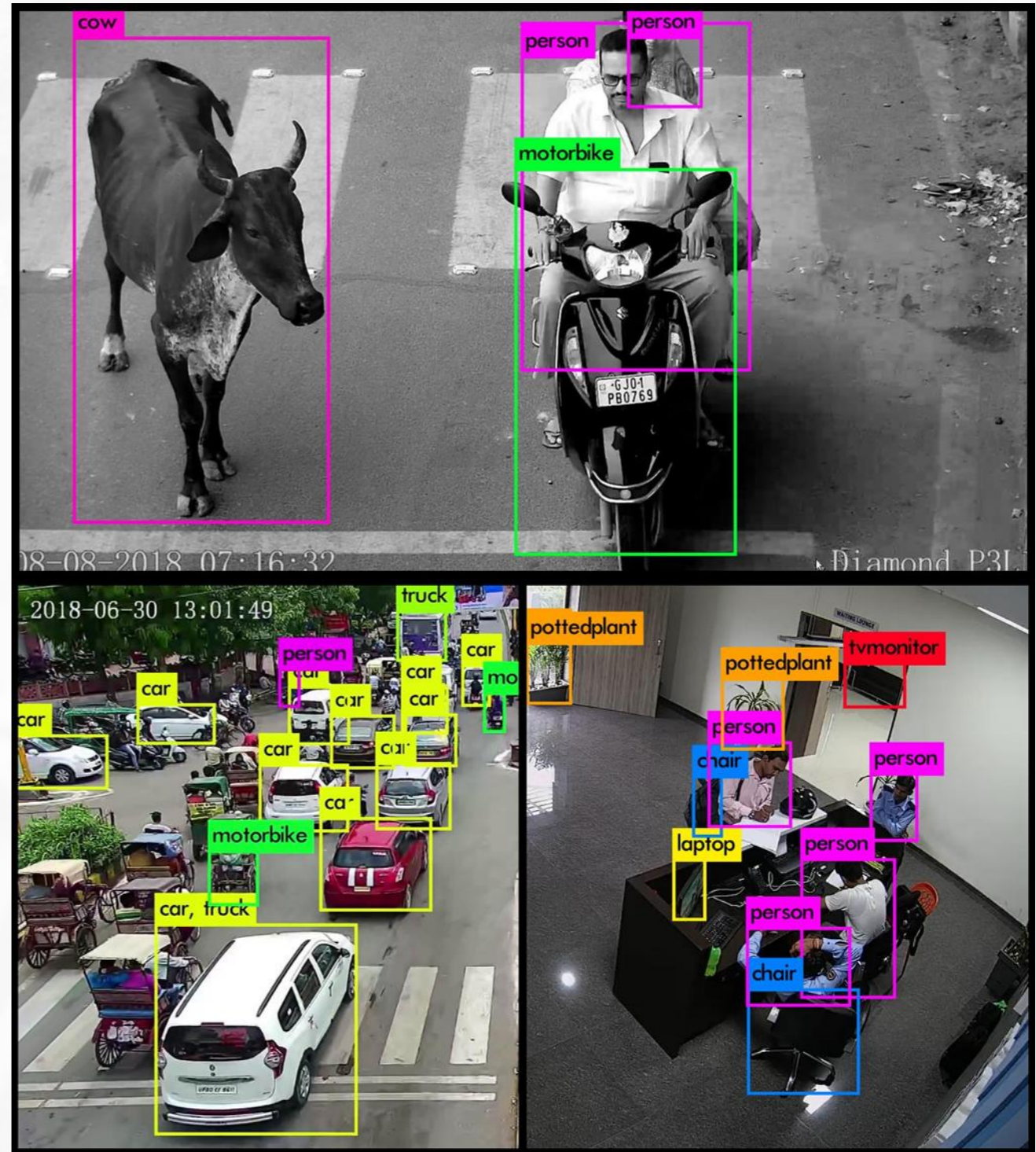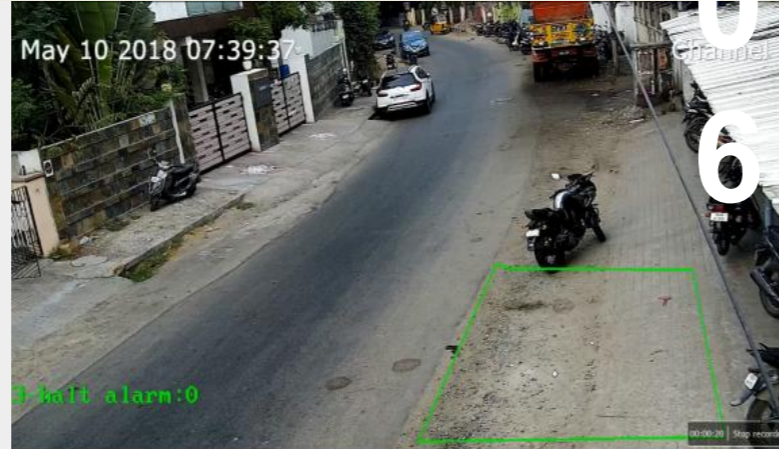
## ABANDONED OBJECT DETECTION

Using Computer Vision techniques, the said engine is able to detect any abandoned object in the defined view.

0
6

## TRIPWIRE INTRUSION + PEOPLE LOITERING

Using edge based Computer Vision techniques, the said engine is able to detect intrusion and loitering.

0
9

A. ORIGINAL VIEW

B. OUT-OF-FOCUS VIEW

C. PHYSICAL TAMPERING

D. CHANGED ZOOM LEVEL

E. CHANGED CAMERA ANGLE

## ILLEGAL PARKING

Without using sensors, the system can detect any illegally parked vehicle in a zone.

## CAMERA TAMPERING

Once the camera settings and presets are defined, it can identify the various unwanted changes to it's parameters and generate appropriate alerts.

0
5

Abandoned:suitcase

5-halt alarm:5
4-halt alarm:31
3-loi alarm:250
2-trip alarm:24
1-osc alarm:48

Building Parking
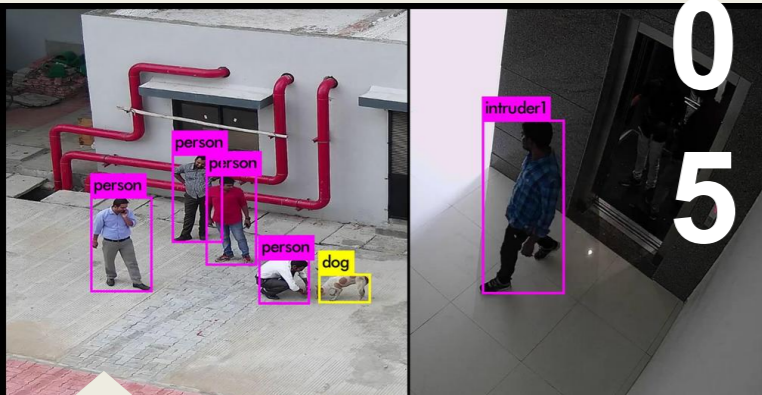
**05**

**SMART VEHICLE VIOLATION DETECT**

AI's deep *pose-estimations*, *object detection, computer vision*, techniques to identify mobile, smoking, no-seatbelt in city traffics.

**09**

**07**

**PEOPLE COUNTING, INTRUSION & LOITERING**

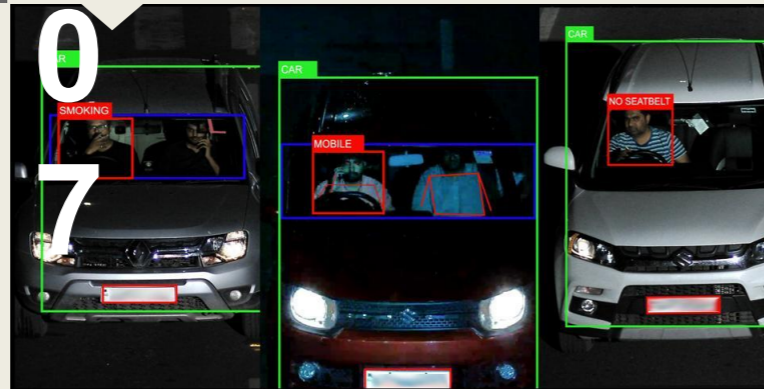Using Deep learning techniques, the said engine is able to count no of persons, detect intrusion and loitering.

**FACE RECOGNITION**

A neural network, been trained on millions of different racial human features, to identify the said face of interest among many.
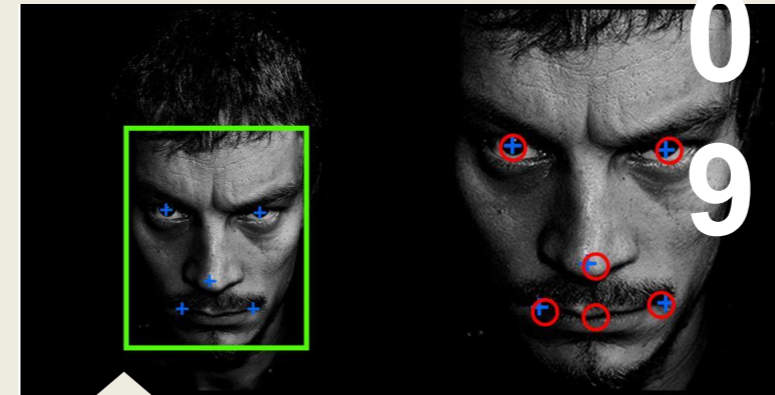
**06**

**CROWD ANALYTICS**

Crowd *Neural Network,* works on mass crowd to identify: number of people, density, crowd direction, close people-behaviour estimations

**10**

**SMOKE & FIRE DETECTION**

A very helpful machine trained engine to recognize a fire and smoke in buildings, grounds, roads etc.

**08**

**ETC ...**

Like a drop of water in ocean, this is only the first few step we have taken in making machine mimic human behaviour in helping protect YOU!

**MANY MORE COMING SOON**

# Limitations of A.I

- *A.I was intended to replicate the process of human thought processes for Cognition, Reasoning, solution finding, predictive analytics and Ultimately Decision making. However, Humans are imperfect models themselves.*

- *One may train an A.I extremely well to surpass cognitive abilities of humans, however the most difficult thing to teach any A.I is **"Common Knowledge"** something that Humans have but aren't entirely sure how to annotate and teach.*

- *Limitations of Data sets is a pervasive problem especially for Smart city use cases. Results can only be achieved after sufficient data is obtained for training and testing models*

- *Users are often underwhelmed simply because of incorrect and over stated marketing, there is still a surprising lack of understanding as to what A.I can actually be expected to do*

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# Setting Expectations Right – for Smart Cities

- *Consult A.I researchers to understand what use cases can be implemented with a surveillance camera. Many make prototypes on webcam / in-room angles, but fail to cognise much in surveillance scenario as pixel density and video quality are not sufficient.*

- *Collect and create a library of videos / Audios which represents the problem case and offer this info prior to bid to enable solution finding and to discourage multiple interpretations.*

- *Group Analytics based on the pixel density and angles that they would require.*

- *Ensure Camera vendors acknowledge the requirements of the A.I vendor and promise to deliver according to the use case, rather than just meeting minimum specifications.*

# Established results with A.I

### Problem Statement: January 2016

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# Established results with A.I

Solution Effect: November 2018

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# Established results with A.I

Results speak

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Thank You