6th Floor, Crystal IT Park, Building No. 1
Right Hand Side , SEZ Indore (MP), India

info@linkites.com

+91 0731-2970111

Rm 605, New Tech Plaza, 34 Tai Yau
Street, San Po Kong, Kowloon, Hong Kong

info@linkites.com

+852 23611886

409 Santa Monica Blvd Suite 2A Santa
Monica, CA 90401

anthony@readythecatapult.com

(424) 234-9123

Linkites
Tomorrow's Solutions Today

Linkites
Tomorrow's Solutions Today

MAKE IN INDIA

Linkites Artificial Intelligence Lab

TECH STACK

Front End

iPhone and Android Mobile app

- Swift 4.0
- Java

Machine Learning

Count and health Analysis

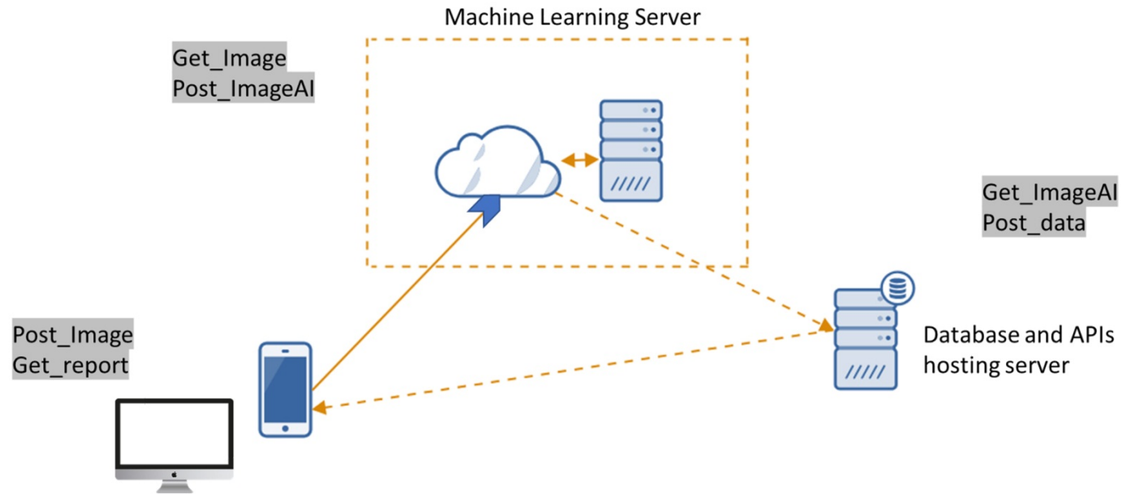
- OpenCV
- Python
- Tensorflow

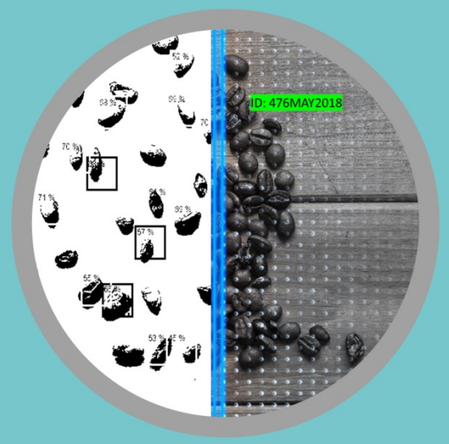
Server Side

APIs and database

- Mongo DB 3.6.4
- Node.js 8.0
- AWS Ubuntu Server

TECH Architecture





Cocoa Beans Detection

Input

Output

Black Channa Detection

Input

Output

01 Artificial Intelligence in WareHouse

Sampling and Grading analysis of various pulses using Linkites Artificial Intelligence trained models.

Use Cases:
Channa Grading, Soyabeans, Coco beans and other pulses grading.

50K
Dataset trained

3sec
Processing time

04
Tesla V-100 GPU

Process of detection

1. Image preprocessing (Using OpenCV)
a. Scale image according to need.
b. Chanel extraction

2. Segmentation Algorithm (Using Opencv) : Find multiple objects in image like(Cocoa Beans, Stone, Threads and other segments)

3. Count the object: Count the segmented object found in image using Non max suppression.

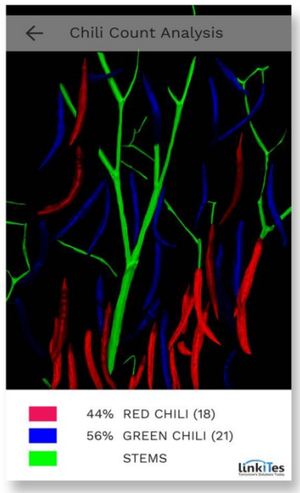
4. Classification of objects found in image :
a. Collect sample images according to classification category.
b. Sample regularization
c. Train a neural network model for image classification with training dataset having four classes (Cocoa bean Healthy , Cocoa bean very Healthy, Cocoa bean Not healthy , Not Coca beans)
d. Extract feature for all the object found in image.
e. Classify object using Trained model.

5. Prepare percentage wise data.

Chilli detection

Input

Output



2. Classification Based on Plant:

- Target Image : Focused Plant image 1080x1080.
- Detection
  - Dataset for Leaf, Fruit and Stamp detection:
    - 3000 Image with bounding box of 3 cat.
    - Number of boxes for each category is more than 1000.
    - Image size : 1080x1080.
  - Achieve 80-85 % accuracy on detection within 2 weeks.
  - Detection model : CNN
- Disease Classification On Leaf
  - Assuming 3 stage of Leaf life cycle.
  - Number of diseases : 25.
  - 1000 Images of leaf for each disease.
  - Image size : 1080x1080.
  - Model : CNN model For Deep learning Or RGB Model.
  - Achieve 80% accuracy within 2 weeks (Depends on dataset)
- Disease Classification On Fruit
  - Assuming 3 stage of Fruit cycle.
  - Number of diseases : 25.
  - 1000 Images of leaf for each disease.
  - Image size : 1080x1080.
  - Model : CNN model For Deep learning Or RGB Model.
  - Achieve 80% accuracy within 2 weeks (Depends on dataset).

Output : Plant Health Percentage (Good, Bad, Moderate) and Type Of disease found in Plant

02 Artificial Intelligence in Agriculture

Crop health detection using Artificial Intelligence on live crop or post harvesting.

Crop Detection/ Classification	Disease Detection	Dense Level, Damage & Total Field Calculation

1 . Classification based on Leaf.

- Target Image : Focus Leaf Image ,Image size : 512x512. (Please find attach sample)
- Dataset for disease classification on leaf : (Please find attach sample)
  - Assuming 3 stage of Leaf life cycle.
  - Number of diseases : 25.
  - 1000 Images of leaf for each disease.
  - Image size : 1080x1080.
- Model : CNN model For Deep learning Or RGB Model.
- Achieve 80+% accuracy within 2 weeks (Depends on dataset).
- Output : Disease type and Infection Percentage in Leaf.

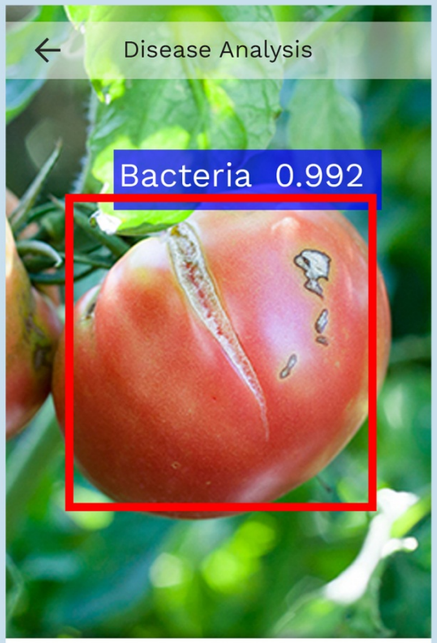
20K
Dataset trained

2.6sec
Processing time

Tomato Disease Detection

Input

Output



DISEASE- Ralstonia solanacearum
DISEASE TYPE- BACTERIAL WILT

03 Artificial Intelligence in Agriculture (Tomato)

Crop health detection using Artificial Intelligence on live crop or post harvesting.

Case Study: **13th July 2018**

Client: **The Angel Farm, Fukui (Japan)**

Objective: Machine learning classifiers to protect Tomato's from diseases by processing leaf images.

Execution Model: For 'The Angel Farm' we have used a large dataset size. Here, the dataset contains 24,828 images of tomato leaves and fruit infected with nine diseases. To train our classifier/models, we have introduced the Convolutional Neural Network (CNN) as a learning algorithm. One of the biggest advantages of CNN is the automatic extraction of features by processing directly the raw images from our dataset. To analyze the proposed deep model, we have used visualization methods to understand symptoms and to localize disease regions in leaf. The obtained results are encouraging, reaching 97.18% of accuracy, which outperforms dramatically shallow models, and they can be used as a practical tool for farmers to protect tomato against disease.

25K
Dataset trained

3sec
Processing time

97%
Accuracy rate

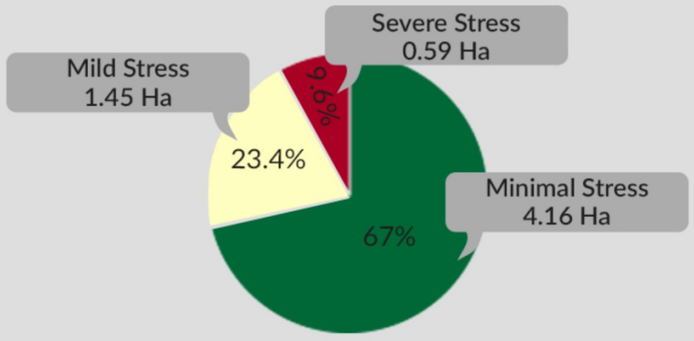
Crop Stress Analysis

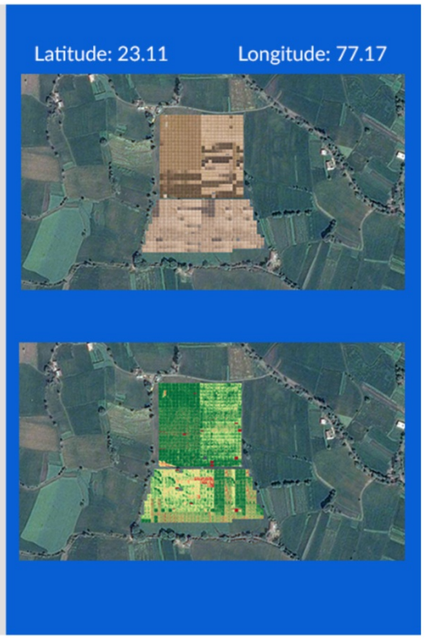
Crop type: Soyabean

Stage: Pre-harvesting

Area cover: 6.20 Ha

Analysis Name: Stress



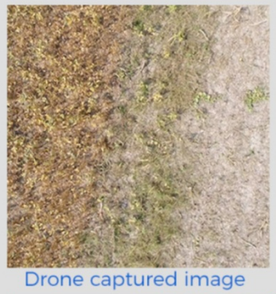


04 Artificial Intelligence in Agriculture (Soyabean)

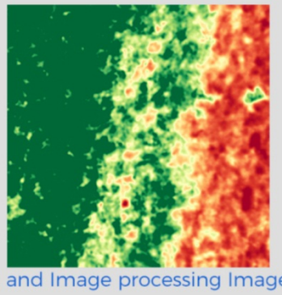
Crop health detection using Artificial Intelligence on live crop or pre and post harvesting.

Crop Detection/ Classification	Disease Detection	Dense Level, Damage & Total Field Calculation

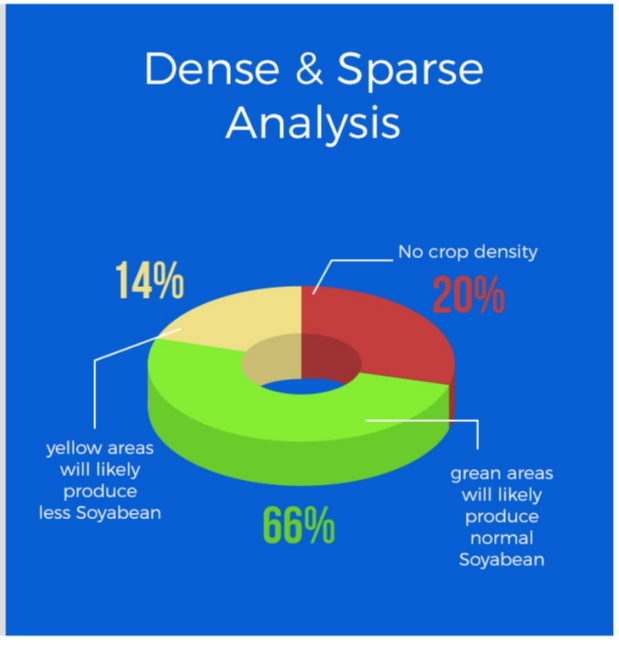
TOTAL PLANT STRESS AREA IS
2.04 ha = 33 % of the field



Drone captured image

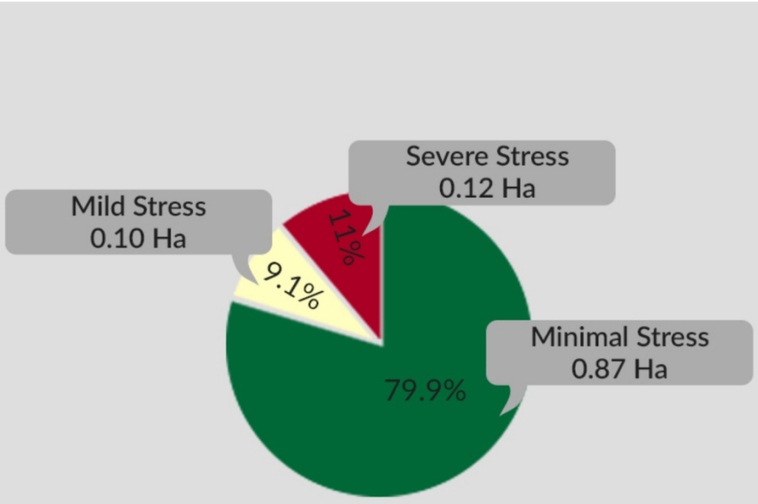


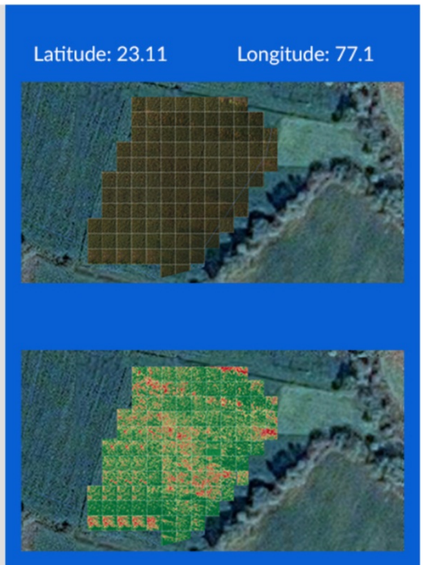
AI and Image processing Image



Crop Stress Analysis

Crop type:	Stage:	Area cover:	Analysis Name:
Soyabean	Flower	1.09 Ha	Stress



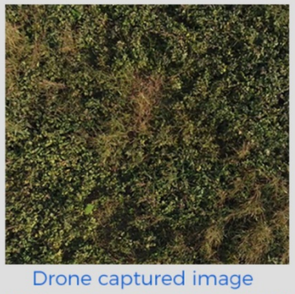


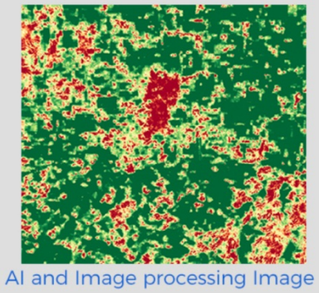
Artificial Intelligence in Agriculture (Soyabean)

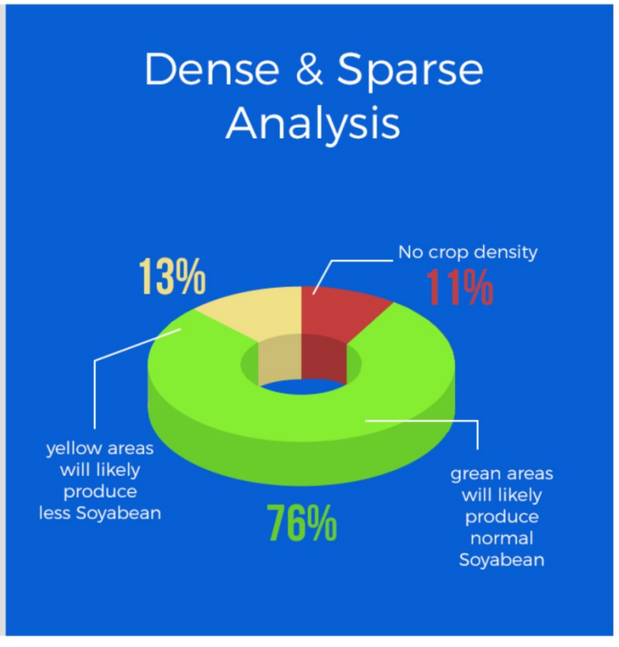
Crop health detection using Artificial Intelligence on live crop or pre and post harvesting.

Crop Detection/ Classification	Disease Detection	Dense Level, Damage & Total Field Calculation

TOTAL PLANT STRESS AREA IS
0.22 ha = 20.1 % of the field


Drone captured image


AI and Image processing Image



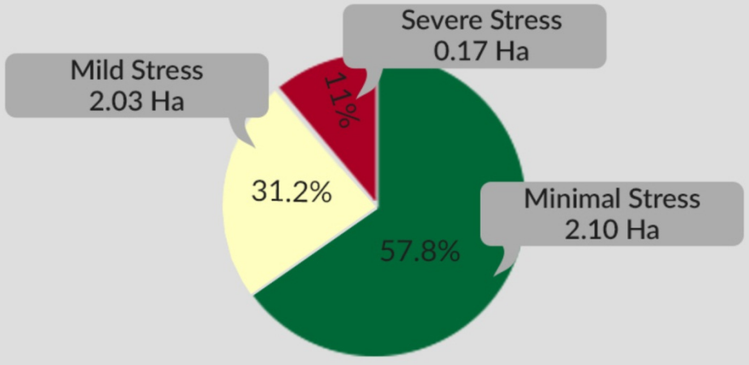
Crop Stress Analysis

Crop type: Soyabean

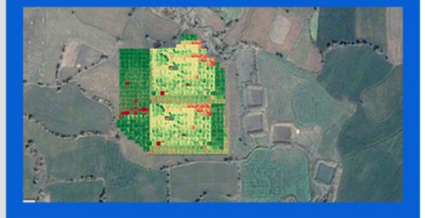
Stage: Pre-harvesting

Area cover: 4.30 Ha

Analysis Name: Stress



Latitude: 23.1 Longitude: 77.1

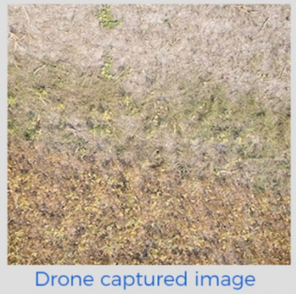


Artificial Intelligence in Agriculture (Soyabean)

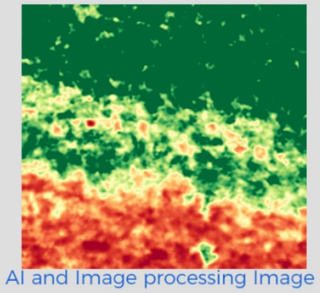
Crop health detection using Artificial Intelligence on live crop or pre and post harvesting.

Crop Detection/ Classification	Disease Detection	Dense Level, Damage & Total Field Calculation

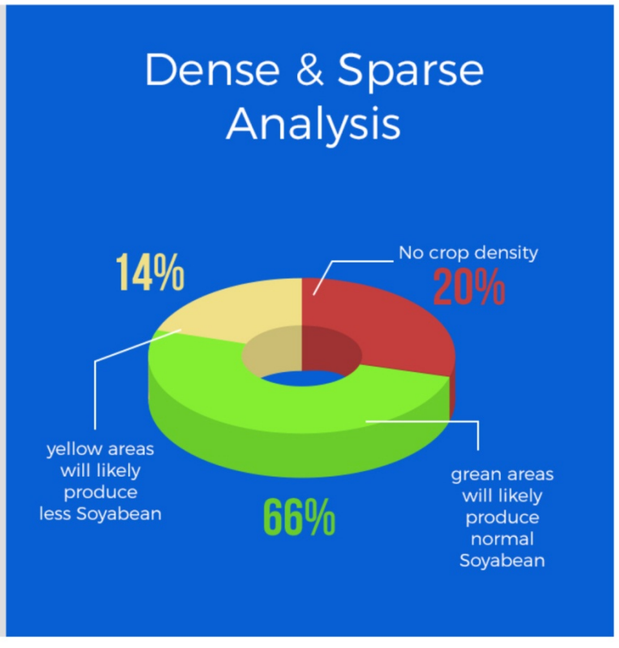
TOTAL PLANT STRESS AREA IS
2.20 ha = 42.2 % of the field



Drone captured image



AI and Image processing Image



Drone 2D to 3D Mapping

05 Artificial Intelligence in GIS Mapping and suvey

Objective - To take Aerial Images using Drone and map the exact location with co-ordinates along with highlighting the major places found in the site.

Our Outcome

- GIS map
- 3D Map with editable mode
- Auto tagging of important places like - Roads, Chiller plants, vegetation etc.

- 20 mins of single fly.
- 100 M^2 Area covered.
- Dashboard to access the map.
- API to integrate drone map to GIS map.

Smart city planning (MAP)

All

- Roads
- Hospitals
- Schools
- Railway Stations
- Wifi Areas
- Public Toilets
- Bus stands

Use Case:

~ Mining Survey

~ Industrial Survey

~ Construction site Survey

~ City Survey

06 Artificial Intelligence in Smart city Planning(Using drone)

A city doesn't have to be big to be smart. What matters is the technology driving the change. Our cities are leading the way with agile and inventive uses of the new technology, proving that no matter what the size of the town, it can be smart.

20+

Hotspots tracked

97%

Accuracy rate

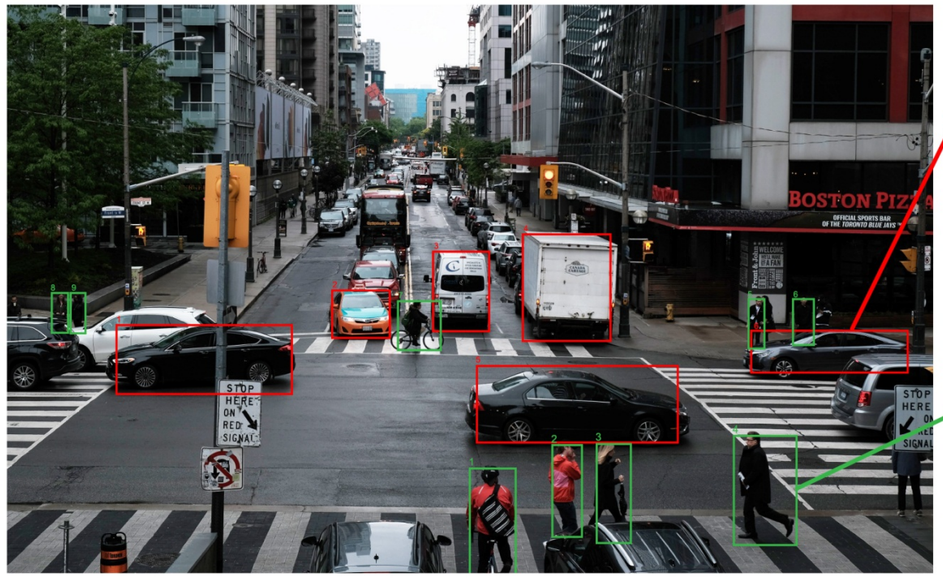
Smart Maps are critical tools to accelerate progress toward Country's social and economic development agenda. Maps answer the basic questions that come up in our daily lives – for citizens, for businesses, and for governments. Maps help us search for places we are interested in, pinpoint their locations, optimize routes to get there, understand surrounding neighborhoods better, and communicate better with others. When maps cannot answer these questions, we rely on other sources that may be costly, time-intensive, or incomplete.

Smart Maps use cutting edge technology to enable users to quickly and effectively achieve their day-to-day and long term goals. Our Smart Maps capture detailed data for a broad range of inputs; present data in a user-friendly, intuitive format; are dynamically maintained in real time; and allow individuals to add additional information, creating a platform for innovation.

Smart city planning (MAP)

INPUT

OUTPUT



07 Artificial Intelligence in Smart Transport Surveillance

Live Smart transport surveillance using artificial intelligence makes transport and traffic management easy to handle.

Vehicle Detection

- Vehicle Color
- Vehicle Number
- Vehicle Model etc.

People Detection

- Total number of pedestrian
- Gender
- Average Age etc.

Use Case:

Vehicle Detection

Waste Dustbin Detection

Invalid Parking Detection

Accident Detection

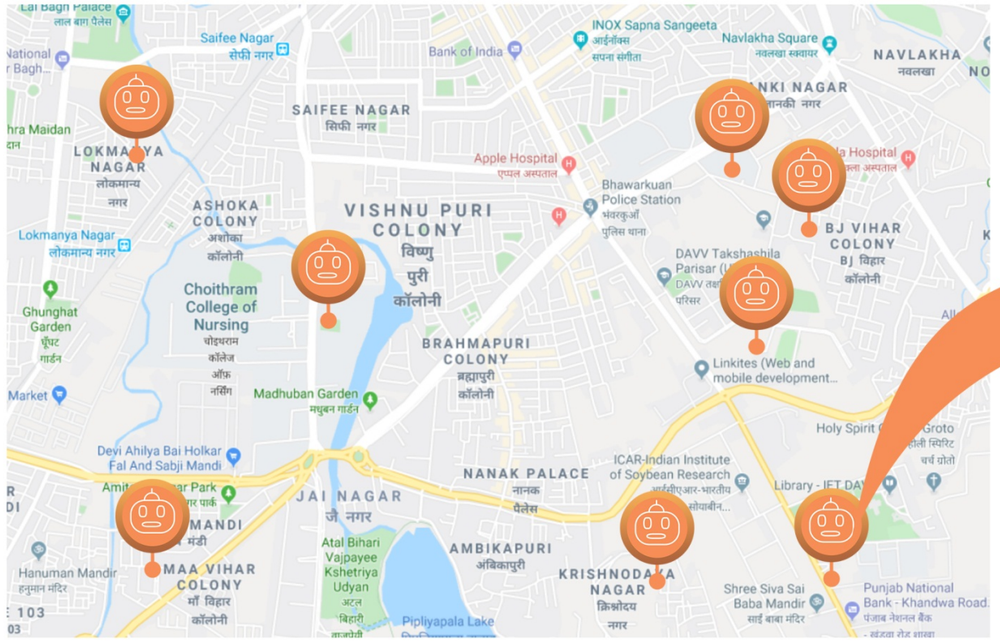
Traffic Monitoring

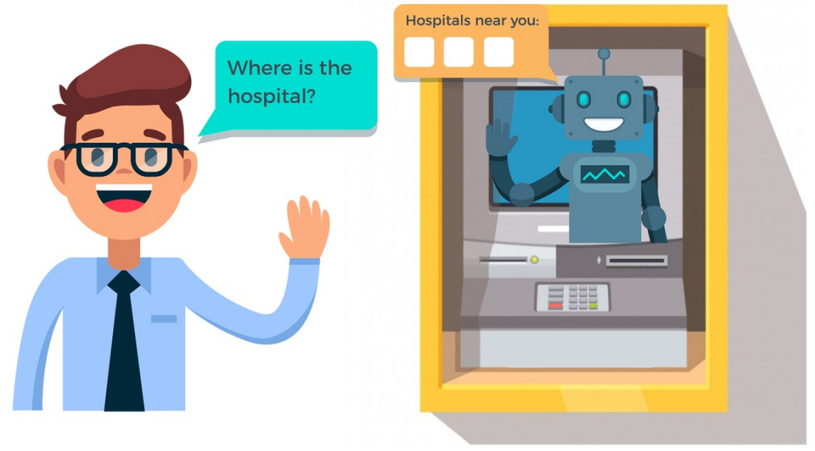
Alcohol, Smoke and Criminal Activity Detection

07 Artificial Intelligence in Smart Information System(Chatbots)

Installing Digital Chat Bot or the Kiosk Centers and the Robots (Audio Bots)

Digital Chat Bot or the Kiosk Centers





Robots(Audio Bots)