

National Center for Artificial Intelligence

Smart City Lab



NATIONAL CENTRE OF
ARTIFICIAL INTELLIGENCE



Agenda



Who We Are



Smart City Lab



Projects



Q & A

Dr. Muhammad Khurram



Director
RCAI
Smart City Lab

Education: PhD (Computer Systems)

Experience: 15 Years – Associate Professor NED

Functional Expertise: Project Management, AI, IoT, Embedded Systems, IC Design, Mixed Signal Circuits, DSP

Current Projects: Smart City, AI in Health, Computer Vision, Smart Agriculture

Key Projects: Smart Health, Embedded Gaming

Who We Are



SUCCESS STORIES



**NATIONAL CENTRE OF
ARTIFICIAL INTELLIGENCE**



**Tech4Life
Enterprises**

OUR CLIENTELE & PARTNERS



THE AGA KHAN UNIVERSITY



Smart City Lab- NED



SMART GOAL: Applying AI to Optimize City Operations



Traffic Management

To monitor and control the flow of traffic through the mega roads of the city by analysing the big data in real time



Visual Positioning

Enhancing user experience by designing AR/VR based smart positioning system, integrating real time data



People Management

Sentiment Analysis



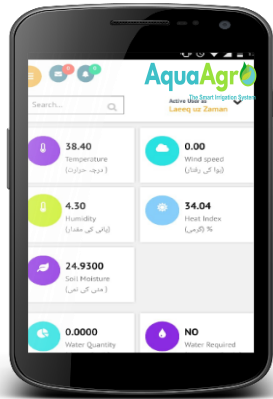
Autonomous Vehicle

Collecting data using the smart vehicles as living sensors



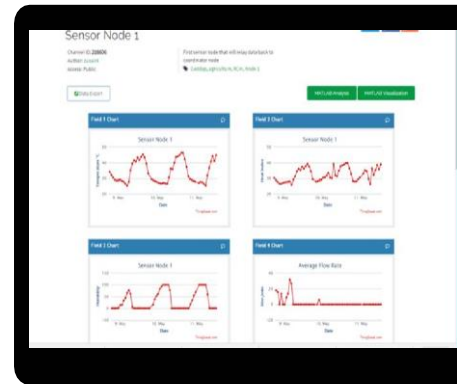
Projects

Android app for Farmers



- *Monitoring*
- *Control*
- *Easy access*

Output Devices on Cloud



- *Showing different parameters measured at the field*
- *Updated on hourly basis*

Save **50%**
Water

Using less water will not only solve water crisis problem but save electricity bills



Grow **35%**
more crop

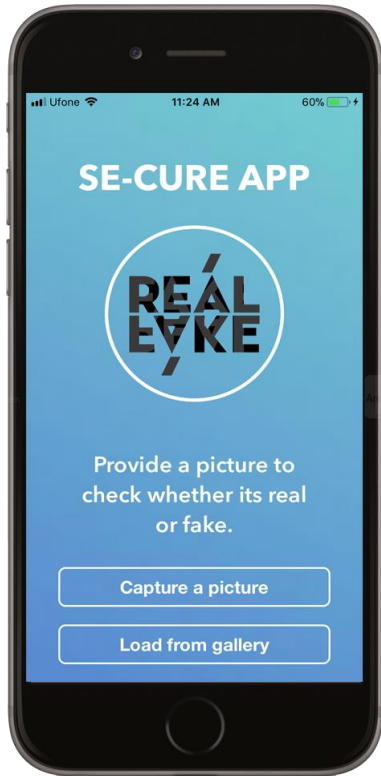
Per acre increase in crop increases **profit margins** for the farmer for the same resources used.



Irrigate more
Acers

The water saved can be used to irrigate more barren acres and further increase revenue

Se-Cure App



Encrypted Image with QR-code



Detect
Counterfeit
Products

90% Above
Accuracy

More than
1000
Samples Tested

Unique
Encrypted
Image



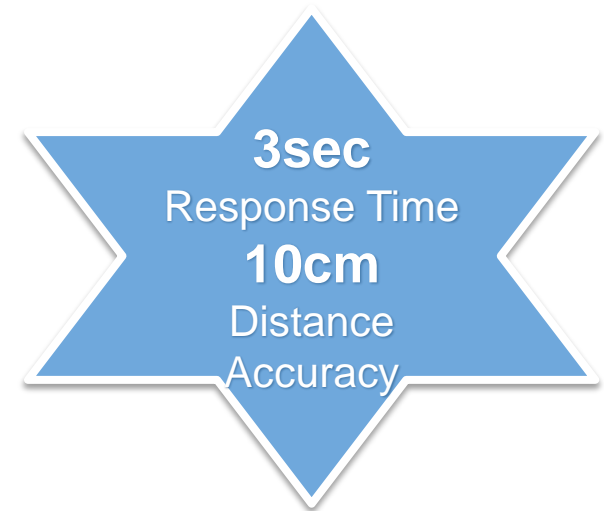
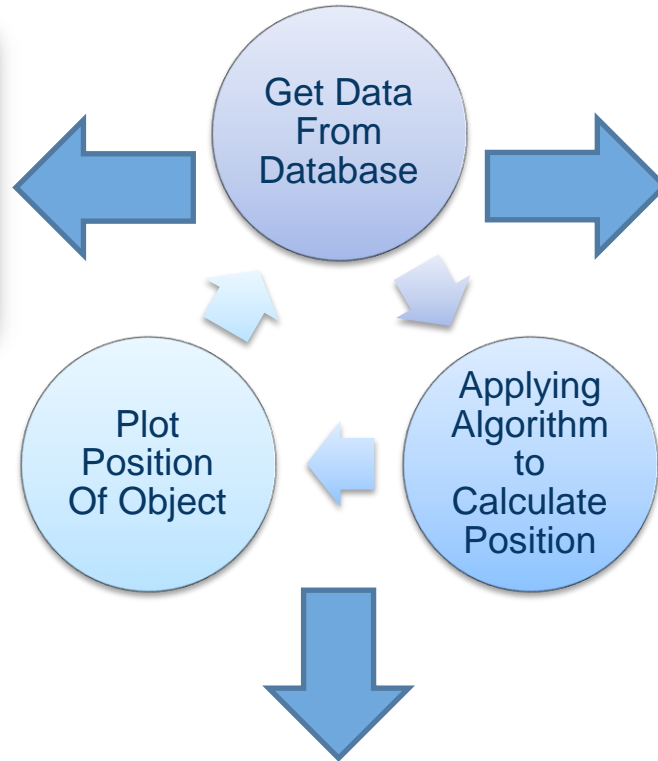
Uncopiable
&
Undetectable

PINS (Positioning & Indoor Navigation System)



Customer Behavior

- Analysis of customer behavior in supermarket & malls
- Object tracking in retail stores



Positioning & Asset Tracking

- Asset & personnel tracking in tunneling
- Asset tracking in warehouse
- Tracking of objects at airport & railways
- Monitoring & asset tracking in healthcare



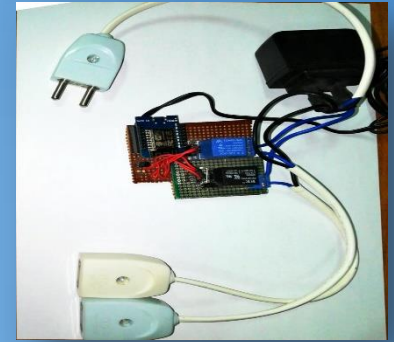
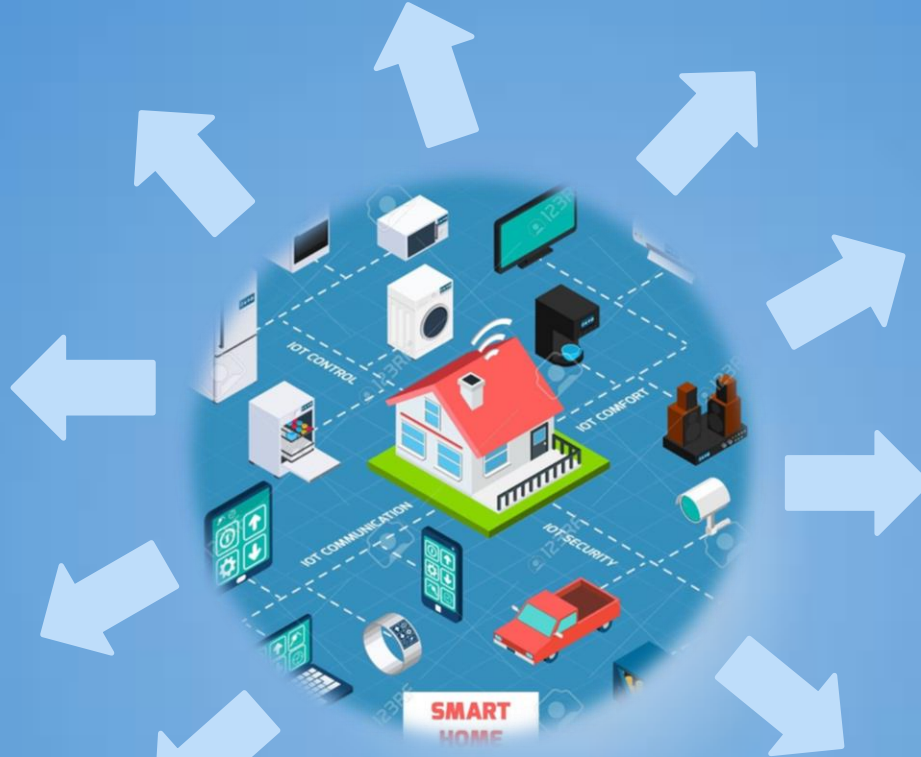
Emergency Evacuation

- Emergency Evacuation of employees/visitors/residents from the facility

Home Automation



**Alexa Voice Assistant
(Amazon)**



**Hardware Development
(Smart City Lab)**



**Integration
By
(Smart City Lab)**



Provides near to real combat shooting environment. Giving an opportunity to individuals to practice and strategize tactics, become proactive and defensive.



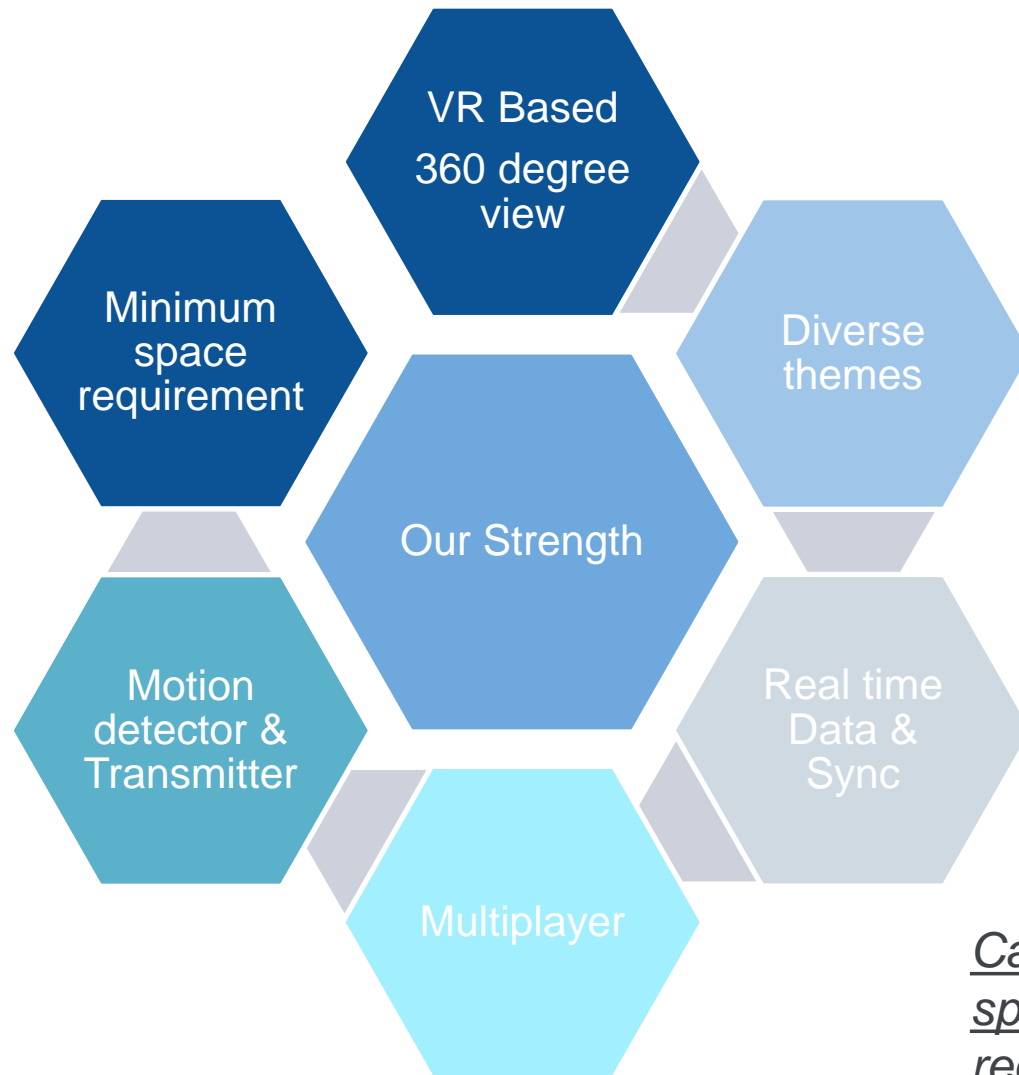
Aim is to address country's current terror situation by providing civil defense trainings through these gadgets



Can be used for military aiming & shooting training as alternative of real weapons



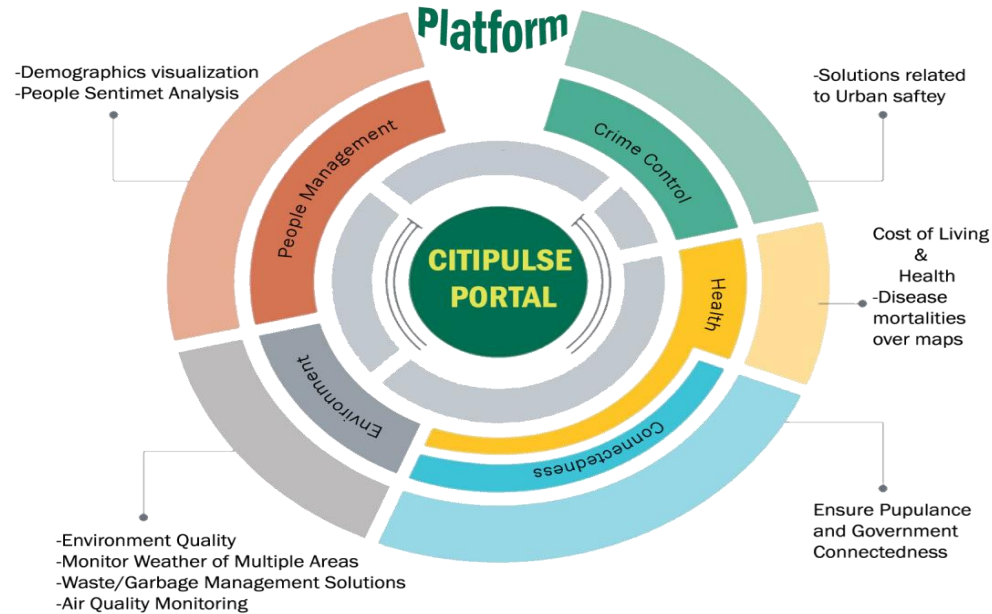
VR Based FPS (First Person Shooter)



Can be customized for military training on specified themes with minimum space requirement

CitiPulse

CityPulse mega plan will be executed under the umbrella of this master project of Smart City which will be pointing out crucial problems of the city to be resolved. This mega project will mainly be providing solutions using Machine Learning and Computer Vision more and more dependent on innovation.



People Management



Safety and Security



Traffic Management and Control



Environment Management

People Management



SOCIAL SURVEYS



DEMOGRAPHICS



CROWD COUNTING

It will help in people management through social surveys. The social surveys will be about the current issues or the problems that people face. It will help to get the public opinion.

Will be showing age, birth rate, death rate, religion, ethnicity and other demographics.

This project will be doing the crowd counting which will help the managers to manage heavy crowd near malls and on events & heavy traffic

Crowd Counting - Image Processing

True Count=619



Estimated Count=439 Accuracy=70%



True Count=1175



Estimated Count=962 Accuracy=81%



Safety & Security

Health

The health feature in the portal will provide data related to different diseases mortalities. It will also help to know about the current health situation of the country. The data will help to take successful measures

Crime Control

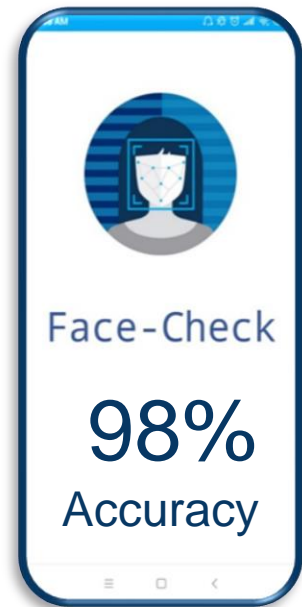
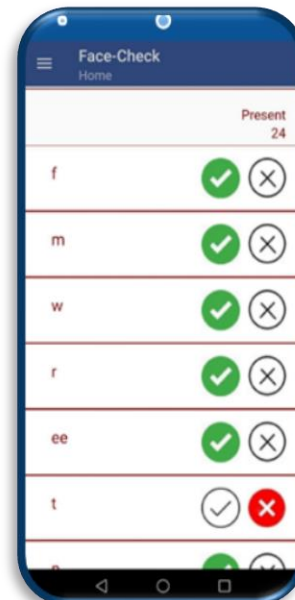
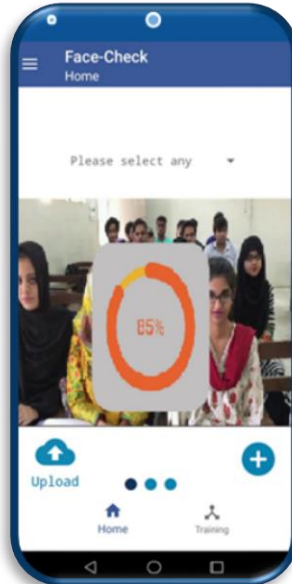
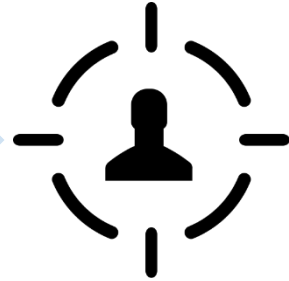
The maps over this portal will show crime rates. The data related to crime will help the police and planning department in making a strategic plan for crime control

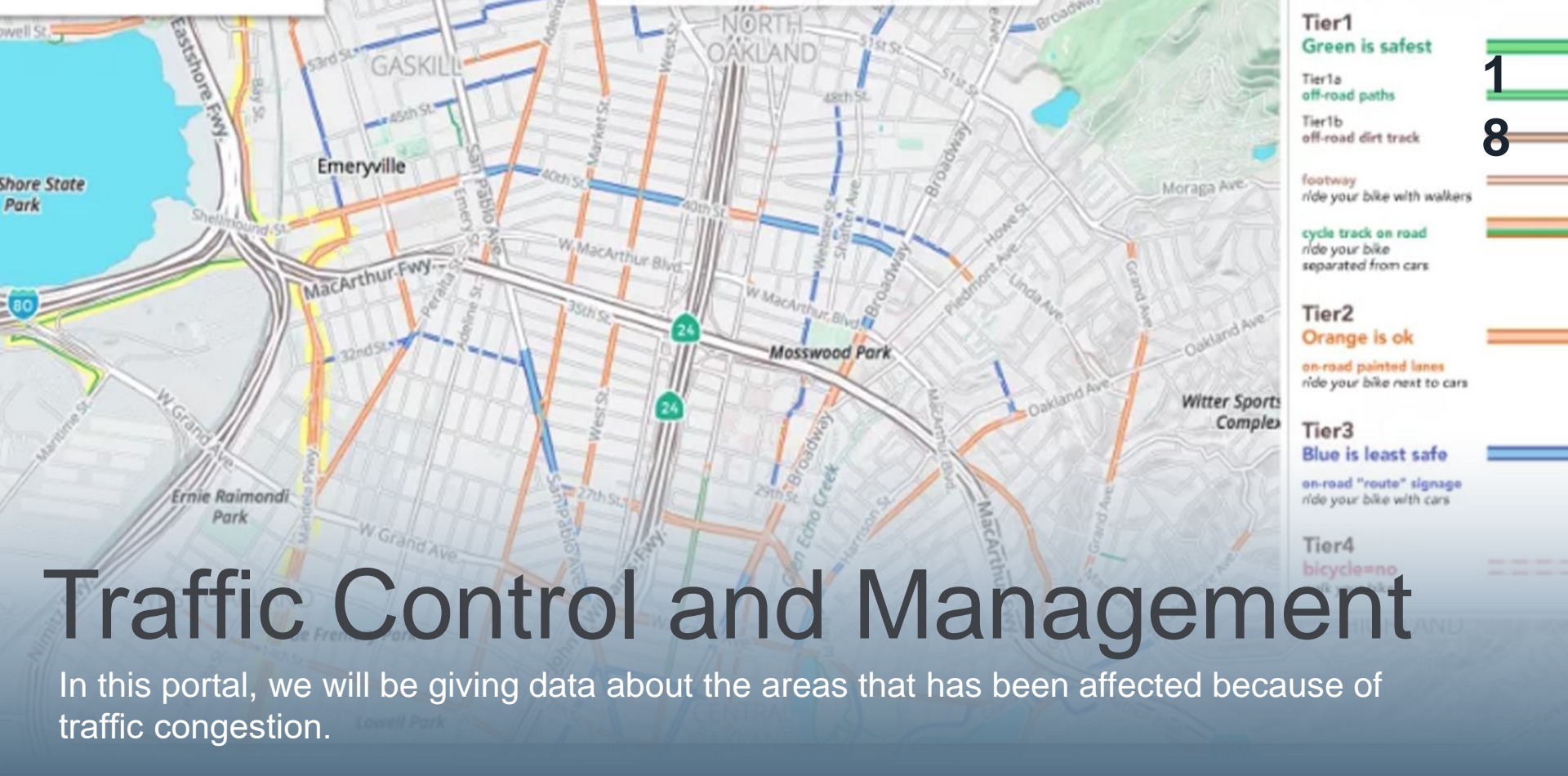
Identify the Suspects in Crowded & Restricted Areas

Train the system through Machine learning AI

Evaluate

Recognize the suspects/
Blacklist Monitoring





Traffic Control and Management

In this portal, we will be giving data about the areas that has been affected because of traffic congestion.

Heavy traffic on different areas is affecting the overall lifestyle of the citizens. People are unable to perform their routine activities effectively, as they experience long queues of traffic on roads. It takes away much of their precious time which otherwise would have been spent more constructively. The data will be shown on portal will help the users to decide the alternative route saving more time.

Federal University Road
University Road Karachi

Total Count: 29

Car : 14

Bike : 14

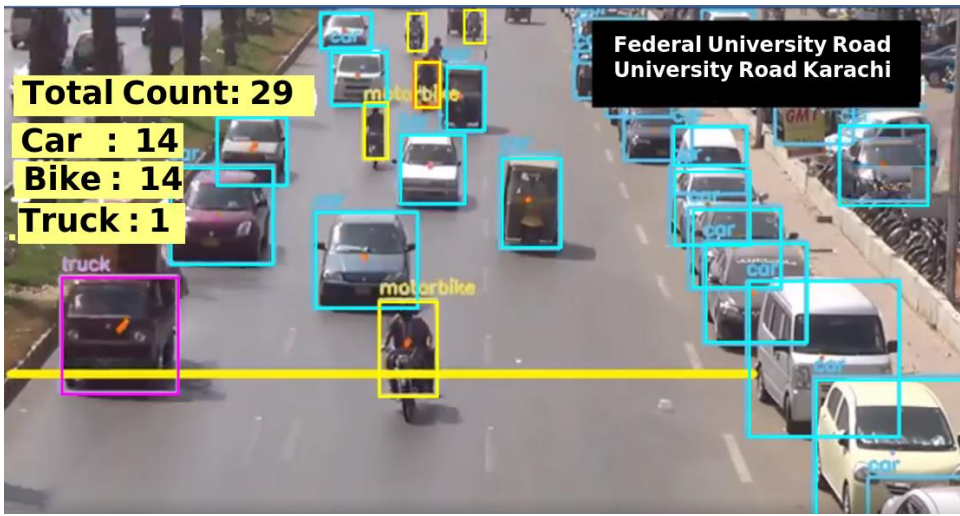
Truck : 1

Solution

Vehicle Count with Classification

An application with an integrated database that will record information about vehicular density. The data will help us know that at what time there will be heavy traffic on the road

Vehicle Counting & Number Plate Detection



Safety & Security



Vehicle classification and counting system for desired controls



Detect and suspect unauthorized vehicles

95%
Accuracy

Surveillance & Monitoring



Data base of registered vehicles

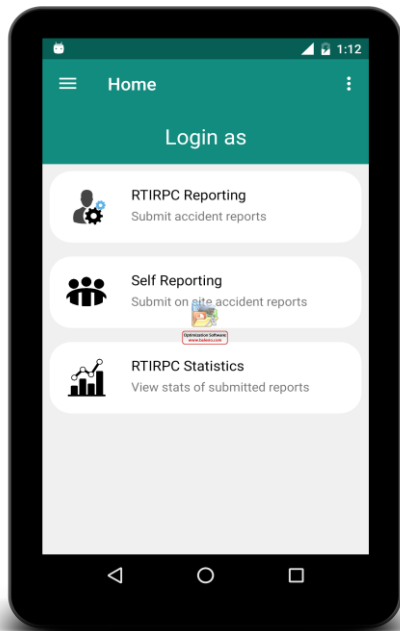
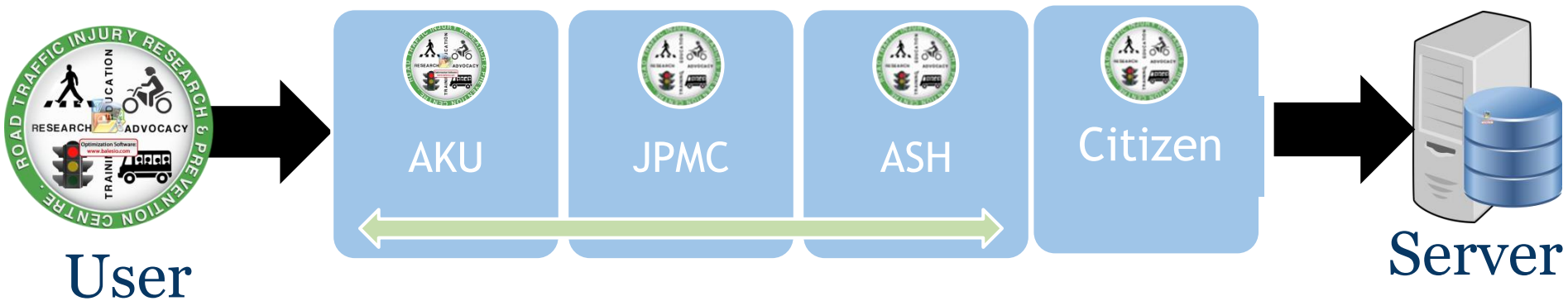


Seamless access for registered & recognized vehicles in restricted areas



Accident Reporting App

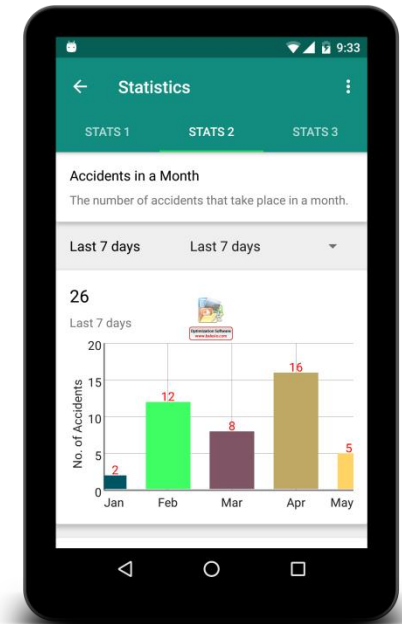
Accidents Data of all Hospitals



Self Accident Reporting



Accident Reporting



Accident Statistics

Environment Management



Mobile application will be integrated with the portal for **Waste management**



Energy Monitoring System



Will provide **Green Space** visualization

Energy Monitoring System

An **IoT** solution

for Commercial & Residential

to **Monitor** Consumption

Use energy **efficiently**

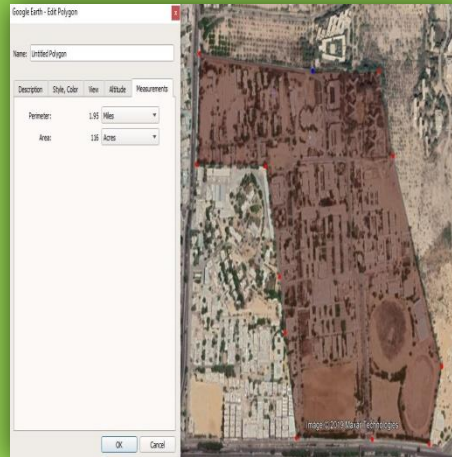
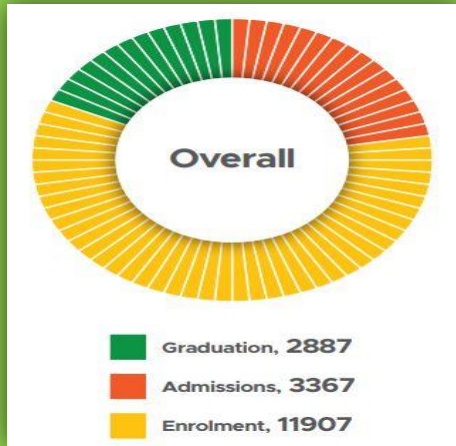
Save **Money** & **Environment**

10% (in initial months)

20-30% (within 2-3 years)



Green Space Analysis for NED



➤ The total Area of NED University is found to be **469435 sq. m. (116 acres)**

➤ Current green space area of NED is **105218 sq. m**

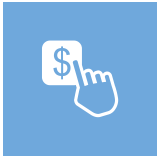
➤ A minimum benchmark of Green Space per person is **9 sq. m.** (UN-Habitat, 2013)



➤ Green Space required for NED's population is **130000 sq. m.** approximately

➤ Therefore, we are deficit of green space area of **24782**

Key Challenges



Bring multiple
stakeholders



Data availability
and accuracy



Funding and
resources



Support in
deployment and
execution

Thank You