Artificial Intelligence And IoT Enabled Safe, Green And Smart Transportation System

Vandana Rohokale
Sinhgad Institute of Technology and Science,
Pune, India
vmr.301075@gmail.com

Ramjee Prasad
CTIF Global Capsule,
Department of Business Development and
Technology, Arhus University, Herning, Denmark
ramjee@btech.au.dk

Outline

- Background of the Research
- Evolution of Intelligent Transportation System (ITS)
- Related Technology
- ITS Service Attributes
- Technology Interfaces Necessary For the ITS Implementation
- Proposed Solution with AI And IoT
- Conclusions

2

Background of the Research

3

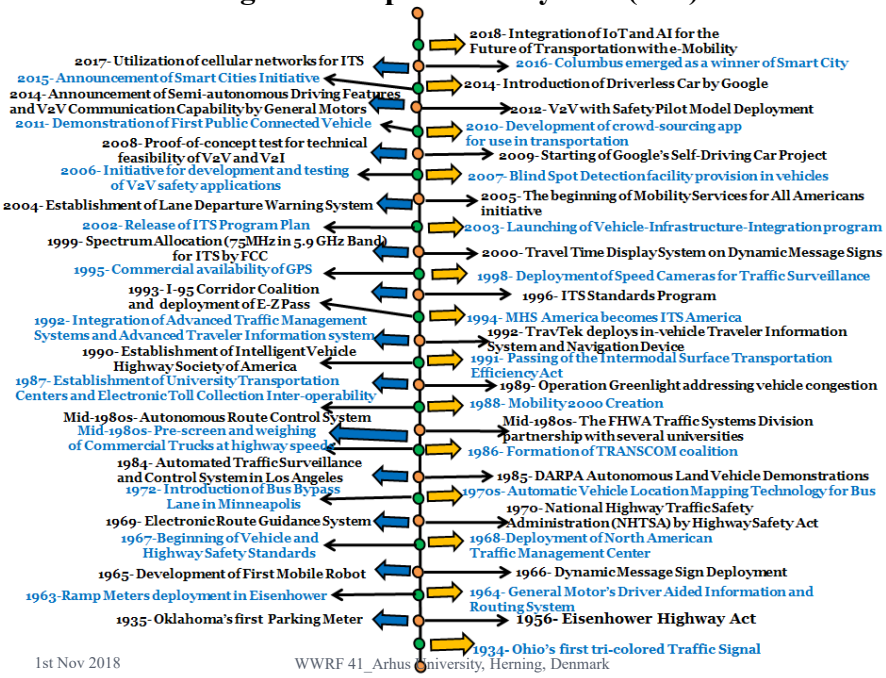
4

Research Motivation

- Vehicular Population in urban areas
- Traffic Congestion
- Temporary but prolonged road blocking and accidents
- Long waiting time for transportation
- Increasing Pollution
- Questioning safety on transportation system
- Declining demand and supply optimization

5

Evolution of Intelligent Transportation System (ITS)



Related Technology Review

Ref Paper / Parameter	Traffic Density (Study/ Analysis)	V2V Communication	Vehicle/Fuel Theft Crime Control	Energy / Fuel Consumption	Air Pollution Control	Signal Timer Automation	Traffic congestion Control	Traffic Control	Traffic Violation	Resource/ Disaster Management
[3]							Yes	Yes		
[4]							Yes			
[5]		Yes								Yes
[6]									Yes	Yes
[7]		Yes	Yes							
[8]							Yes	Yes		
[9]						Yes	Yes	Yes		
[10]	Yes						Yes	Yes		
[11]					Yes					
[12]	Yes						Yes	Yes		
[13]	Yes							Yes		
[14]		Yes							Yes	
[15]										Yes
[16]							Yes	Yes		
[17]	Yes						Yes	Yes		
[18]										Yes
[19]	Yes	Yes								
[20]		Yes						Yes		
[21]										Yes
[22]								Yes		
[23]								Yes		Yes
[24]	Yes						Yes	Yes		
[25]			Yes							Yes
[26]										Yes
[27]					Yes		Yes	Yes		
[28]							Yes	Yes		
[29]								Yes		Yes
[30]								Yes		Yes
[31]							Yes	Yes		
[32]		Yes						Yes		
[33]	Yes							Yes		

7

Research Gaps

•There is need of huge work in the areas like energy consumption reduction, air pollution control, traffic violation control, disaster management, traffic signal timer automation, traffic density management and overall vehicle to vehicle communication through vehicular adhoc network (VANET).

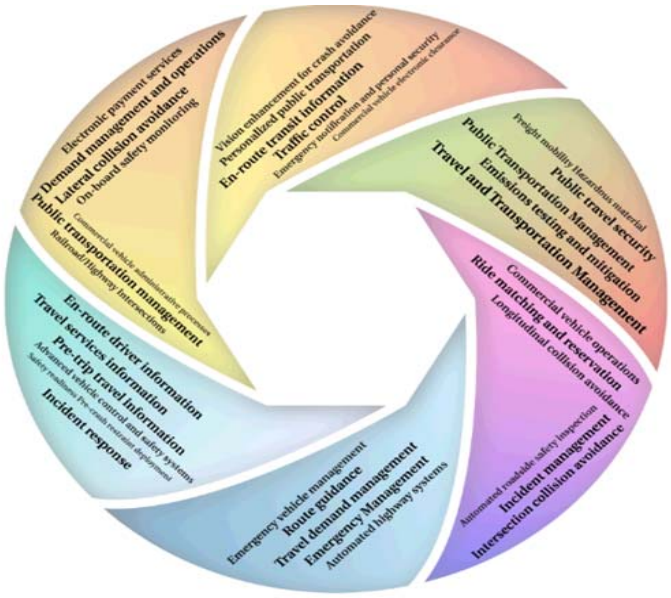
•Also signal timer automation is another unattended research area which needs more attention.

•Automation is necessary for the immediate punishments for the people or vehicles that violate the traffic rules and regulation.

•Air pollution control should be given highest priority while designing and developing the vehicles.

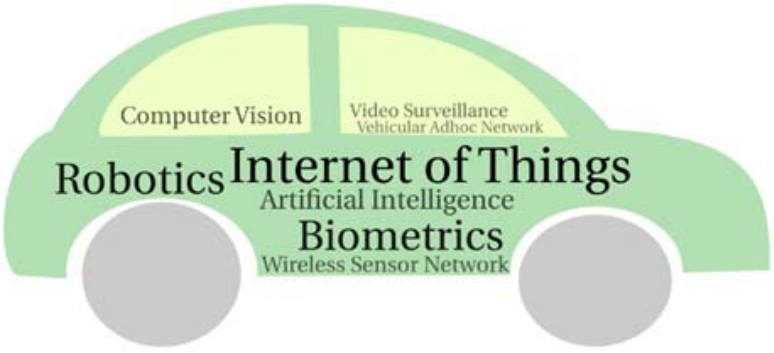
8

ITS Service Attributes



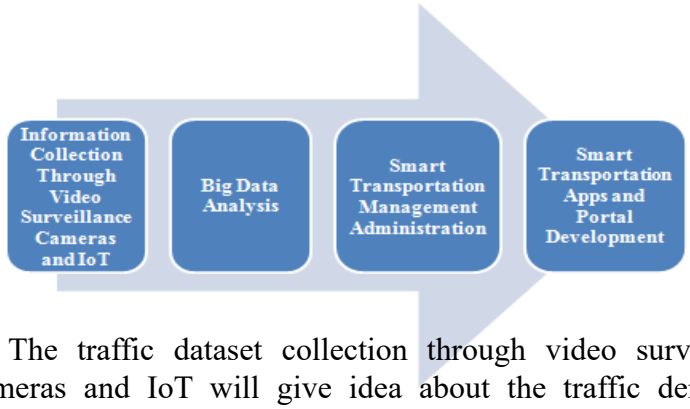
9

Technology Interfaces Necessary For the ITS Implementation



10

Proposed Solution with AI and IoT



1) The traffic dataset collection through video surveillance cameras and IoT will give idea about the traffic density at various locations in the urban area.
2) Big data analysis at various centers will help in traffic management strategy planning.
3) The traffic signals will be automated based on the traffic density.
4) Pollution will be monitored and controlled with IoT.

11

Conclusions

• Integration of the booming technologies such as Artificial Intelligence and Internet of Things is the must for the implementation of ITS.

• Analysis of the huge data generated through these daily transactions needs machine learning approach.

• Convolutional neural networks and deep learning can provide good insights for the solution of complex traffic congestion problems.

12


Alone we are smart.
Together we are
brilliant.
~ Steven Anderson

Thank You....

13