

## Technical Disclosure Commons

---

Defensive Publications Series

---

September 13, 2018

# PASSENGER SECURITY FOR PUBLIC TRANSPORT SYSTEM

Rajesh Bindiganaville Jagadish

Manoj Kumar Kushwaha

Jayantilal Agrawal

Devendra Dadhich

Follow this and additional works at: [https://www.tdcommons.org/dpubs\\_series](https://www.tdcommons.org/dpubs_series)

---

### Recommended Citation

Jagadish, Rajesh Bindiganaville; Kushwaha, Manoj Kumar; Agrawal, Jayantilal; and Dadhich, Devendra, "PASSENGER SECURITY FOR PUBLIC TRANSPORT SYSTEM", Technical Disclosure Commons, (September 13, 2018)  
[https://www.tdcommons.org/dpubs\\_series/1505](https://www.tdcommons.org/dpubs_series/1505)



This work is licensed under a [Creative Commons Attribution 4.0 License](https://creativecommons.org/licenses/by/4.0/).

This Article is brought to you for free and open access by Technical Disclosure Commons. It has been accepted for inclusion in Defensive Publications Series by an authorized administrator of Technical Disclosure Commons.

## PASSENGER SECURITY FOR PUBLIC TRANSPORT SYSTEM

### AUTHORS:

Rajesh Bindiganaville Jagadish  
Manoj Kumar Kushwaha  
Jayantilal Agrawal  
Devendra Dadhich

### ABSTRACT

Techniques are provided to effectively monitor and alert situations involving compromised passenger security in a public transport system. This solution includes three layers of voice synthesis. The first layer includes voice sensors/enablers incorporated within passenger vehicles. The second layer is a fog/edge layer with a voice threat detection mechanism. The third layer is a cloud layer with Machine Language (ML) trained models. These techniques help build a safe and secured society.

### DETAILED DESCRIPTION

In today's world of developing economies, cab aggregators play an important role in public transport systems by providing cab services for passengers to travel from one destination to another. Safety and security of passengers are of prime importance during these travel times. Security is breached frequently during night travel for women/children passengers in modern cities without proper monitoring/alerting mechanisms. When a panic situation arises, passengers may not be in a position to use their mobile phones to make an emergency call. In case of accidents, there are incidents where the passengers are alive but health care reaches them very late, resulting in increased chances of passenger mortality.

There is a need to enhance passenger vehicle security via cognitive techniques. Although current research in the field of Global Positioning System (GPS) or SOS applications assist in a few ways to enhance security, they are still human dependent or will not reveal the incidents that are happening inside the passenger vehicles. Incidents are happening regularly inside passenger vehicles even though the vehicle is fitted with a GPS tracker.

The Internet of Things (IoT) can help provide the best monitoring solution to handle an emergency situation. There are prudent ways in which IoT devices can effectively monitor situation and raise alarms if necessary. Voice may be used as a potent mechanism

to enhance real-time monitoring situations and report the incidents. This can augment current Global Positioning System (GPS) tracking mechanisms used in passenger vehicles.

The solution consists of three layers of voice synthesis to effectively monitor and alert situations. The first layer includes voice sensors/enablers incorporated within passenger vehicles. The second layer is a fog/edge layer with voice threat detection. The third layer is a cloud layer with Machine Language (ML) trained models.

The passenger vehicle (irrespective of model, make, or purchase date) may have compatible voice sensors which captures voice or conversation continuously. These sensors perform basic voice capturing to send the conversations to the fog/edge layer for further processing.

The fog/edge layer performs filtering in various stages. First, it recognizes the voice intensity to determine the sensitivity. The layer may have Natural Language Processing (NLP) enabler Application Programming Interfaces (APIs) to effectively identify the speech or voice conversation. The layer contains a repository of a dictionary of words to help determine the nature and intent of the incoming speech. The fog/edge layer may have the capability to reject records that do not fall into a predefined threat category. As such, it does not record everything that it receives and in turn does not breach the privacy of passengers having conversations in the passenger vehicle.

Once the fog/edge layer performs voice filtering and determines there is a potential alarm, it sends the speech to the ML APIs hosted in the cloud. The ML APIs in turn correlate the incident or the speech with a pre-trained model to precisely determine the nature of the incident and ensure it is not a false alarm. Once confirmed, it again performs one or more tasks.

One task is to classify what type of incident it is (e.g., accident, kidnapping, atrocity, etc.) based on the pre-trained model. Another task is to record the voice for further investigation purposes if needed. Yet another task is to raise an alarm by providing GPS details to the nearest patrolling vehicles or other connected vehicle to take immediate action. Finally it can initiate an automated call or send a Short Message Service (SMS) to report the incident if the passenger has registered a relative's/friend's number.

As the time lapses are quite critical, the complete round trip from the time the voice is captured by the voice sensors until the alarm is raised may be less than thirty seconds as

this may be very critical to the life of passengers. Overall this cognitive mechanism may reduce crime rates in modern cities.

Figure 1 below illustrates an example overview.

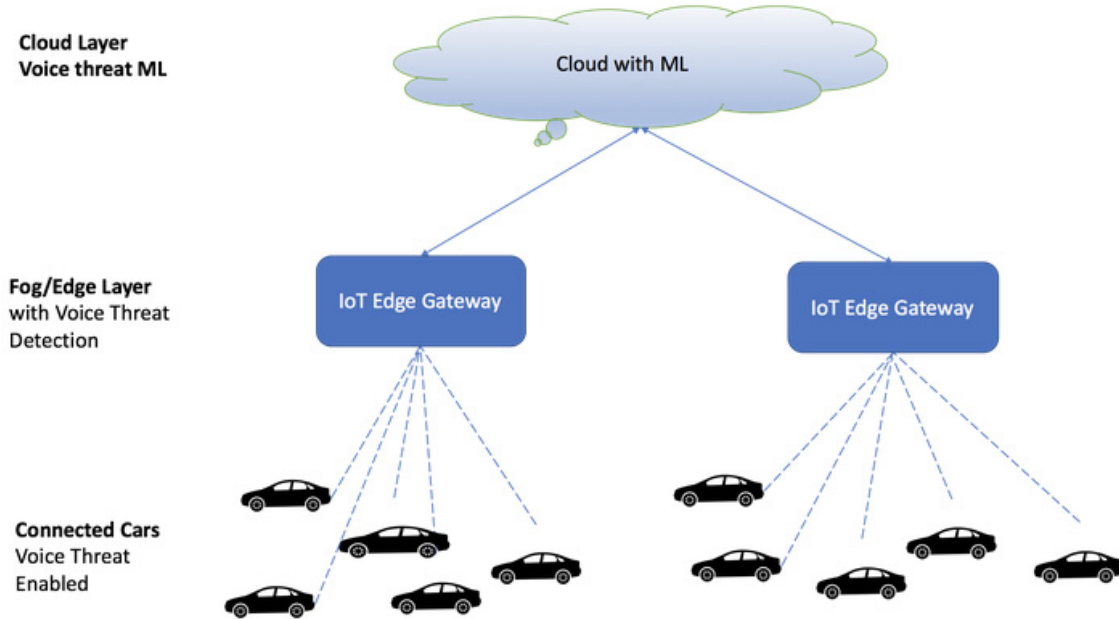


Figure 1

In summary, the techniques described herein greatly minimize any untoward incident that can happen in a moving passenger vehicle. These techniques may in turn lower crime rates in metropolitan cities and help build a safe and secure society.