

Aim: To make Pune safe and secure with help of Data, Government officials, Pune Municipal Corporation, Emergency response teams and Citizens of the city.

Objective: The perspective of the android application is to reduce the response time of the government officials and other emergency services to respond to user queries and ease the government's decision making process.

Literature review: With the increase in the number of private vehicles, there has also been an increase in the risk of accidents in the city. To reduce the number of casualties, we identify the black spots for the accident-prone zones with respect to time and day of the week so that drivers are aware and more conscious while driving.

Pune Municipal Corporation has 4 Road Maintenance Vans (RMV) for 4 of its zones wherein the user calls on a toll-free number, registers his/her complaint which is then forwarded to these RMVs for further action. To reduce the response time by even more, we aim to create a feature in the application wherein the user can upload the image of the road defect he/she is facing and his/her location will be tracked by the phone's GPS service. This image will be validated using a classifier and if found to be true, the location will be forwarded to the RMV for further action.

We will be profiling crimes according to their causes so as to eradicate them. For example, after analysis, it was found that many crimes which occurred were due to unemployment. Thereby, if we eradicate the root cause of unemployment by recommending various schemes to citizens, we can reduce the crime rate by a significant amount.

For senior citizens, we aim to create a portal to interact with others through a community so that they could contact each other at times of emergency.

Idea In Brief: With citizen safety and security being identified as a priority in Pune, we aim to create a unified android application which covers the following domains:

For **accident monitoring**, we performed k-means clustering followed by association rule mining on a dummy dataset of London(UK) to associate the causes of what led to the accidents. Using the results obtained from this data mining technique, predictive analysis is done so as to monitor the black-spots with space and time constraints. In addition to hotspot monitoring, we also provide a functionality to quickly contact the emergency services like the police stations, hospitals, blood banks, ambulance, etc. This will reduce the response time of calling different authorities for the same problem. For fire, women and child safety, we aim to create similar emergency services and black-spots monitoring.

Mobility Obstructions: We consider here the example of potholes. To eradicate potholes the user uploads the picture of the pothole and the app captures their location (latitude and longitude coordinates using the GPS). The app will authenticate whether it is a pothole using image classifier. The hotspot will be monitored and characterized into cold or hot depending on the intensity of the potholes present in the particular area with an accuracy of 10 meters.

Polling and Notifications:- By maintaining the anonymity, we can take public opinion using polls on whether the issue is correct or not and if the problem really exists in that area. If the problem defined is true, appropriate steps from the authority in-charge would be taken. Not only for potholes or other road safety issues, we can implement polling in helping aid the government with various schemes. Thus, by taking poll for important decisions and

maintaining the anonymity of the user we can decentralize democracy. We also plan to design a platform wherein government officials can broadcast important messages like city crisis, election news, schemes, etc. hence removing the middleman and improving the response.

Tackling Viral Messages: For increasing the safety of all citizens we have created a portal wherein citizens can report viral messages and within hours they will be informed whether the message is fake or true by validating it from domain experts, forums and other volunteers.

Crime Profiling: For reducing the crime rate of Pune to zero, we aim to categorize the type of crime say, dowry, theft, murder, rape, etc, analyze and monitor those areas. Using k-means clustering and association rule mining we will be able to identify which of the crimes are linked together and give rise to other crimes. Depending upon the time and location, we can provide heat-map and also provide emergency services via the application.

Senior Citizens: We have located communities which could be self-help groups or old age homes. The app will make sure that only senior citizens use this service by age verification. At times of emergency, we link emergency services like ambulance, blood banks and hospitals which they themselves or other people in same group could call and ask aid for.

Technology Stack:

Server Side
Framework: PySpark, MLXtend, Scikit-learn, Blockchain(Future Scope)
Programming Language: JAVA, Python
Backend: Firebase SDK
Database: Firebase Real-time database, Firebase Storage, Firebase Authentication Server, Firebase Cloud Messaging
Operating System: Android

Client Side
Android Application

Dependencies: Data of accidents, crime from government database.

Future Scope:

1. For polls to maintain anonymity of the users and also secure user reviews we aim to upload data on blockchain.
2. Bicyclists and pedestrians are more efficient users of scarce road space than private motor vehicles, helping to combat congestion. Bicycling and walking are the most efficient and environmentally sustainable means of making short trips. Pune has already begun implementing bicycle lanes and must continue to do so on all corridors, more specifically mobility corridors. We will mark bicycle lanes on the map and also identify more congested areas leading to a more efficient traffic management system thereby reducing the risk of accidents.
3. For tackling viral messages, we will be validating the messages using sentiment analysis combined with Naive Bayes classification.

Source-code: <https://github.com/Heisenberg0203/gitsafe>