**Abstract**

Human overpopulation is among the most pressing environmental issues. And one of the problems due to it is to maintain the connectivity within the peoples. The connectivity here is could be any mode of communication or any mode of transportation. Now, the world is in the IT Age thus communication is not a significant problem but transportation-related problems still persist. The need for transportation is not only limited to the availability of modes of transportation but it is also dependent on the medium of transportation. To satisfy this need humans invented subways and flyovers. But the ever going increase in demand for transportation is unstoppable. So we have to develop new ways to tackle problems related to transportation. Due to significant development in the field of GNSS, the location-based researches are now much improved. Now, most of the smartphones have one or more GNSS embedded in them. This system allows to track their daily routine, provide location-based services, location-based recommendation, etc. So we can also use this system to identify the need of an individual or general public with the help of analysis of their data and this technique is classified as Activity Recognition. Many of the users use activity recognition on a daily basis to track their fitness routine, to enjoy automated assistance in their work, etc. Thus we are going to use the same technology to determine the mode of transportation of an individual in transit. This process can become the preliminary for the other processes like transit time calculation, optimal route suggestion, and it also helps researchers in pre-processing the trajectory data because the different mode of transportation affects the nature of data and hence may require a different approach to the process.

The project starts from manually retrieving the GPS data through smartphones. Then the data is fed in the pre-processing stage. This stage resolves the problems regarding the raw data, like handling semantic errors, removing outliers etc. Then the extracted data is processed through the segmenting stage to decompose the whole data into small homogenous datasets. At last, data enters the final stage, which is to identify the mode of transportation in each segment through analysis. Our aim is to automate the process as much as possible.

The challenge is to identify the mode of transportation because the modes of transportation don’t follow the same characteristics everywhere, every time. Example the speed of the vehicle is much more in the general time as compared to prime time. Here prime time is the time when traffic is most like morning time 8:00 to 10:00 and evening time 5:00 to 7:00 when the general employee’s office time starts or ends. And this time varies for different places. Also, the average speed in India is less than the western countries. So, one way is to fix the speed threshold according to location-based speed limits like in local roads the speed limit for motorcycle is 40kmph while of Car is 30kmph while on the highway it is much faster. But the problem with this solution is that speed is solely dependant on driver of the vehicle, which means some of the people doesn’t follow the limits while others could not follow due to some intrinsic ( like, vehicle condition, driver experience etc ) or some external ( like, road condition, traffic congestion, environmental conditions etc. ) conditions. And, thus the decision boundary for these cases are not very crisp and thus overlaps other conditions. Thus we are using the Fuzzy Inference System to counter this problem.

Lastly, we are comparing results obtained from the various algorithms and comparing performances of the various algorithm in terms of Accuracy, Sensitivity, and other factors.