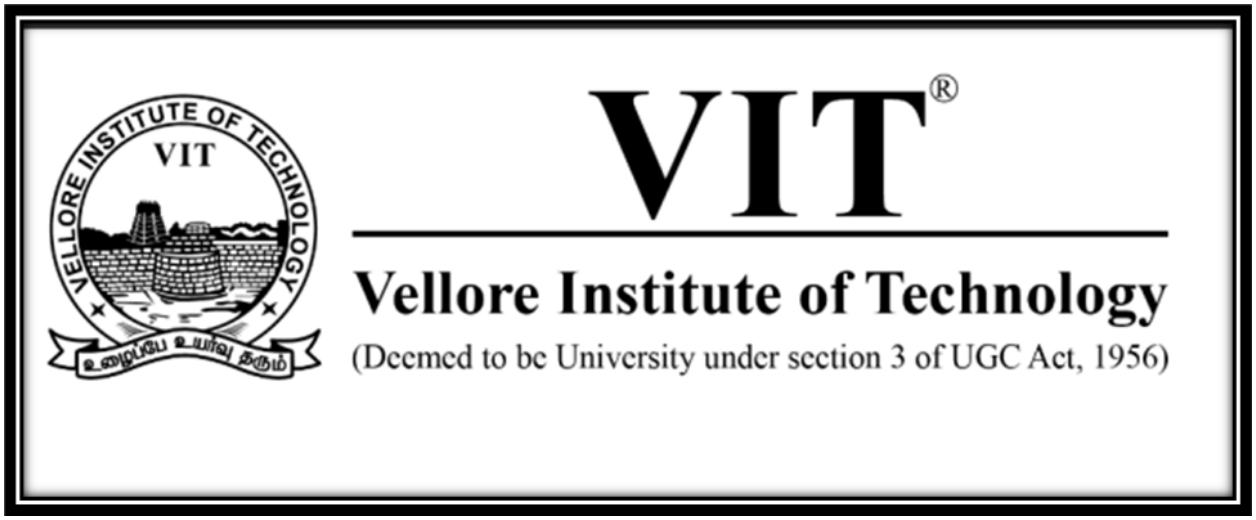

Digital Assignment -1
CSE1901
Summer Semester Special 2021-2022

App Based Road Safety Violation Recording System

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Introduction :

The project work deals with the implementation of a complaint registering system as a web application. The aim of the project is to develop a user friendly and easily interactable web based portal to log a complaint against any vehicle/transporter who is not abiding by the rules and guidelines of the company. It also includes the feature of viewing a complaint and its respective details along with its resolved status. The portal is supported by an admin feature which enables certain authorized users to interact and edit the status of the logged complaint. The main objective of the project was to develop a functioning website which has all the aforementioned features to make the complaint logging system digitalized and hassle free. This project also speeds up the complaint logging and complaint resolving process and also ensures a certain level of data and user security.

Problem Statement :

In any industry where logistics division is present, a network of transportation is imperative, especially road transport.
If we take the case of steel producing industry like Tata Steel, there is a need to monitor and evaluate constantly the proper mechanism of parking and scheduling the road transport vehicles in order to reduce and nullify the issues that may arise due to uncoordinated transportation.

Research Paper	Proposed Work	Gaps Identified
Catastrophic factors involved in road accidents: Underlying causes and descriptive analysis By Imran Ashraf,Soojung Hur,Muhammad Shafiq,Yongwan Park, 2019	This paper aims to investigate the factors associated with road accidents in South Korea. The rainfall data of the Korea Meteorological Administration and road accidents data of Traffic Accident Analysis System of Korea Road Traffic Authority is analyzed for this purpose.	This paper generalizes the notion that the more the experience the driver has, the susceptible he is to road accidents. It also does not take into account the collision type which might provide insight into the accidents causes.
Analysis of Road Accidents in India and Prediction of Accident Severity By Sajal Jain, Shrivatsa Krishna, Saksham Pruthi, Rachna Jain & Preeti Nagrath, 2021	In this paper, an attempt has been made to study the various factors associated with a road accident and its effect on the cause and severity of the accident by analyzing the road accidents occurring in the nation of India from 2000 onwards. In this paper, decision tree classifier has been implemented for the prediction of the severity of a road accident.	This paper mainly aims at providing the reasons and causes for major road accidents in India. It does not aim to provide any solutions for the same. Also, the model used here to predict the road accidents severity is based on decision tree classifier model and is only 80% accurate.
A Framework for Analysis of Road Accidents By	In this paper, the road accident data analysis uses data mining and machine learning techniques, focusing on	Although this paper provides comprehensive machine learning based techniques to analyze the road accidents, it

Shristi Sonal, Saumya Suman, International Conference on Emerging Trends and Innovations In Engineering And Technological Research (ICETIETR), 2018	identifying factors that affect the severity of an accident. It is expected that the findings from this paper would help civic authorities to take proactive actions on likely crash prone weather and traffic condition	does not take into account the characteristics of humanity and behavior which are also important in road accidents. This paper fails in providing a better solution to the road safety issue or even discussing some new approaches that could be used to tackle the issues identified.
Francesc Soriguera, Enric Miralles, Driver Feedback Mobile App, Transportation Research Procedia, Volume 18, 2016	In this paper the human factor in driving and its consequences for road safety have been discussed. The paper provides relevant information on the driver in terms of a grade depending on the aggressiveness and risks taken while driving. Different driving contexts have been explored and smartphone sensors have been identified applying cluster analysis to the measurements, and treated independently giving us an idea on how to approach the road safety problem.	The solution the paper provides is a bit too dependent on the sensors available on the smartphone rather than on cars. The availability of these sensors could vary depending on the regions the driver is located in. The smartphone is a battery constrained device and the sensor usage in a long journey could affect feasibility of the solution.
Apostolos Ziakopoulos, Dimitrios Tselentis, Armira Kontaxi, George Yannis, A critical overview of driver recording tools, Journal of Safety Research, Volume	This paper explores traditional survey methods like questionnaires, police reports, and direct observer methods initially, followed by investigating issues pertinent to the use of driving simulators. The paper provides an extensive section for naturalistic driving data tools,	The paper acts as more of a review paper than providing a better solution to the road safety issue or even discussing some new approaches that could be used to tackle the issues identified. The paper does not provide a method for reducing the high costs identified in the study for using new

72, 2020	including the utilization of in-car diagnostics (OBD) and in-vehicle data recorders. The in-depth incident analysis and the usage of smartphone data is useful in approaching a solution.	technologies in order to tackle road safety issues.
Milan Tešić, Elke Hermans, Krsto Lipovac, Dalibor Pešić, Identifying the most significant indicators of the total road safety performance index, Accident Analysis & Prevention Volume 113 2018	A wide range of road safety indicators have been explored in this paper. Road safety performance index (RSPI) obtained on the basis of a larger number of safety performance indicators (SPIs) have been found to enable decision makers to more precisely define the earlier goal-oriented actions. We learn about the need for calculating a road safety performance index before coming up with a better approach.	The paper does not address the variation in safety performance index or other performance indicators based on different regions. For a country like India, a lot more factors need to be considered for determining a general safety performance index for the entire nation. Similarly, the paper fails to address the adjustment of various factors for various countries.
Guo, D., & Onstein, E. (2020). State-of-the-art geospatial information processing in NoSQL databases. ISPRS International Journal of Geo-Information, 9(5), 331.	This paper has worked on the geospatial storage of data in a NoSQL based language. Geospatial information has been previously stored in a relational database such however this paper has discussed the value and efficiency of processing the data by storing it on a NoSQL database. The paper discusses the implementation and correspondence of applications that use NoSQL DBs and its difficulty of using a different	The paper has given insight and has motivated us to work with NoSQL databases to build our app and store the location data while recording any sort of road safety violation. However the use case model which we want to incorporate cannot be sufficed by geospatial storage itself. We will be including a part of the storage feature along with our own data supplemented with the spatial data

	relational DB for geospatial data	
Anand, D., Khemchandani, V., Sabharawal, M., Cheikhrouhou, O., & Ben Fredj, O. (2021). Lightweight technical implementation of single sign-on authentication and key agreement mechanism for multiserver architecture-based systems. Security and Communication Networks, 2021.	The authors have stated the importance of authentication in any application. The paper discusses in detail about single sign on authentication which is based on the key agreement or signature based agreement. The use of a single authentication verified with a key across various devices hosted on multiple servers is discussed. The authors have also thrown light about the applications which are hosted on multiple servers and communicating between them is also authenticated using SSO	The paper speaks in depth about SSO however for our application which tends to solve high traffic and high latency issues across an app server, will make it very tedious and time consuming. Instead of an SSO if we can apply a middleware which will help us communicate with all the servers in the multi server architecture and validate each request individually. This will help in balancing the load on the frontend servers which will allow a good user experience and the backend can use middleware based token authentication to provide security.
Mehra, M., Kumar, M., Maurya, A., & Sharma, C. (2021). MERN stack Web Development. Annals of the Romanian Society for Cell Biology, 25(6), 11756-11761.	This paper states that the MERN stack is excellent for building a complete web system. This paper looks at four components of the MERN stack (MongoDb, Expresses, ReactJs & NodeJs) and how well they work together, their beauty as a complete stack in web design. This paper focuses exclusively on the functions of these four MERN stack technologies and how they are applied to current popularity.	This paper has only talked about MERN Stack based applications. In our project, we will be using MERN however for generating a globally located image storage, a Firebase based FileStore will be used. Also to provide a free, easy and interactive UI/UX Tailwind CSS will be used for the frontend. Express and React servers will be hosted on 2 different servers.

Prevalence and occurrence of the problem

Road safety happens to be a primary concern all over the world considering the fact that it affects every individual nation, people within the nation and consequent impact on the economy and public health of the nations across the globe. Major reasons for accidents are unruly traffic and bad condition of roads, absence of sign board, unauthorized median cuts etc. Thus, preventive measures should be taken and modern technology can be used to address the issue. As per the data published by the Ministry of Road Transport and Highway, India, the total number of accidents increased by 2.5 percent within the span from 2014 to 2015 and the rate of deaths because of accidents is 400 deaths every day. Another report on Road Accidents in India 2016, published by Transport Research wing under Ministry of Road Transport & Highways, Government of India, has revealed that more people died on roads accidents in India last year, as compared to the number of deaths in 2015. The data has further revealed that the states of Uttar Pradesh and Tamil Nadu have accounted for maximum number of deaths.