TRAFFIC PREDICTION AND ROUTE DETAILS FOR AN INTELLIGENT TRANSPORTATION SYSTEM

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Abstract— **The number of injuries, as well as worries regarding driver and passenger safety, is rising on a regular basis. Countries that have effectively reduced road traffic danger have taken a "systems approach" to road safety. The problem of speed lies at the heart of the road safety debate. Speed and the amount of accidents, as well as the severity of the crash's repercussions, are clearly linked. This framework presents a speed limit camera monitoring/tracking system that makes use of the Global Positioning System (GPS) and cloud computing, as well as a Software-as-a-Service (SaaS) module, to deliver useful information about roads in order to improve safety. It also warns the driver about signs, breaks, and prospective connections to other roadways.**

Keywords— GPS, **Software-as-a-Service (SaaS), Cloud computing.**

INTRODUCTION

Distributed computing is a fresher innovation that incorporates a planning system as a key part, taking into consideration the handling of a lot of information [1]. Distributed computing is another innovation that can possibly change customary IT frameworks. It is critical in the present mechanical world.

Consistently, individuals use distributed computing in some structure or another [2]. Distributed computing and capacity frameworks give people and organizations the capacity to store and handle information in outsider server farms. To accomplish network soundness and economies of scale, it is crucial for share assets. Distributed computing has become famous because of advantages, for example, low help costs, elite execution processing power, versatility, convenience, and accessibility [7]. Speed limit consistence is a traffic police drive to increment driving wellbeing by upholding speed restricts and hindering drivers from abusing them by fining the people who do. Side of the road speed traps set up and run by the police division, as well as robotized roadside'speed camera' gadgets, are among the instruments, techniques, and approaches utilized. However long the speed issue isn't settled primarily by street configuration, designing advances, or vehicle innovation, speed authorization will stay a significant speed guideline instrument. In this article, a speed implementation camera checking/global positioning framework has been presented utilizing distributed computing by consolidating the (SaaS) model with (GPS) to furnish the driver with a road guide, subsequently further developing rate limit authorization and forestalling further mishaps.

RELATED WORK

Z. N. Rashid[1] provide a panel discussion on distributed parallel processing and distributed cloud computing, two of the hottest topics in this field. Several components of this review study have been investigated, including whether or not these topics have been treated concurrently in previous studies. This study also discussed the techniques, which were simulated in both distributed parallel computing and distributed cloud computing. The goal is to spread jobs among resources and then rebalance calculations between servers for maximum efficiency. These help us achieve the device output rates we want. . During our research, we revealed some of our findings. During our research, we presented several papers that explained how to construct distributed cloud computing apps, while others introduced the concept of minimising reaction time in distributed parallel computing. [2] S. Md Aminur Islam, Faisal Bin Abul Kasem and F. Ahmed, "Cloud Computing in Education : Potentials and Challenges for Bangladesh C LOUD C OMPUTING I N E DUCATION : P OTENTIALS A ND," IJCSEA, vol. 7, no. 5, pp. 10–21, 2017. Cloud computing is a notion that is still in its infancy. It's a young technology with the potential to upend traditional IT infrastructure. It is critical in today's technology environment. It is used on a daily basis in some form or another by many people. This trend is not exclusive to the education sector. . By exchanging information technology-related materials in the cloud, educational institutions will be able to better focus on delivering crucial instruments to students, teachers, faculty, and staff. Bangladesh is a developing country in the process of becoming more developed. As a result, Bangladesh faces a tremendous problem in deploying this technology in the education sector.

PROPOSED SYSTEM

➢ The proposed system is organized with two sides (clients (frontend) and server (backend)).

➢ The frontend-side consists of a mobile application that is hosted on an Android or iOS smartphone with GPS built-in, while the backend-side consists of a single host that is the hosting server where the backend component resides to manage requests and routings (Streets and traffic camera details are stored in a cloud server that is maintained in cloud structure).

➢ In the device cloud architecture of software systems participating in cloud computing delivery, several cloud components communicate with each other using a loose coupling mechanism such as a messaging queue.

➢ provide information to the user about his or her driving speed, position, and other factors. A cloud server is a virtualized computing server that an administrator can access over the Internet. The location of all streets and traffic cameras (Latitude, Longitude), as well as the maximum speed allowed on each street, may be found in the database..

➢ The System Model is a diagram that depicts how the system works (Client and Server) The proposed framework uses the term "client" to refer to GPS-enabled Android and iOS devices such smartphones, laptops, and other mobile devices. The "cloud server," on the other hand, is a web server that keeps a database of speed limit camera locations, handles request inquiries, and provides data to a remote client. The client uses GPS to pinpoint the climax's location. The client uses GPS to locate itself and plot it on a map, as well as querying the cloud server for the closest location..

➢ Additionally, storing street details in terms of speed breakers, signals, road markers, Next road details
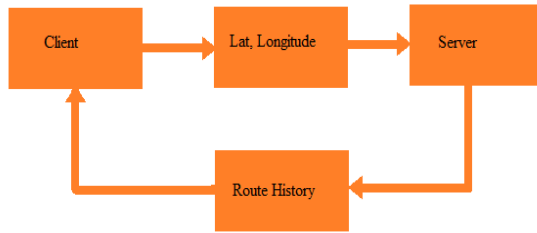
SYSTEM ARCHITECTURE

Figure 1:System Architecture

METHODOLOGY

❖ The system consists of two Modules:

• Server: Server provides the database storage for speed limit locations and process request query and sends data to the client at the remote location.

• Client: Refers to GPS build in Android and iOS devices like smartphones, tab etc.

❖ **Pre-processing:** The movie was captured with a mobile camera with pixels. During pre-processing, the footage was converted into frames. The number of frames, frame rate, colour format, and frame size are among the parameters extracted. The backdrop image was used to do ROI Extraction. Vehicles approaching the camera are tracked in this project, and only one lane of the road is designated as ROI..

❖ **Moving Vehicle Detection:** The ROI was calculated using the context model as a guide. It is tough to detect a moving car from video. The temporal differencing approach, the optical flow algorithm, and the background subtraction algorithm are all methods for detecting moving objects. To obtain the background image, only two neighbouring frames are used in the temporal differencing procedure..

❖ **Optical flow algorithm:** Detects an entity by itself utilising camera motion. The optical flow algorithm is computationally challenging and not appropriate for real-time applications. Background subtraction employs the absolute difference between the background model and

each instantaneous snapshot to detect moving items. A backdrop model is a photograph that contains no moving things. In this work, the context subtraction technique is employed to detect moving automobiles. The three phases of the background subtraction algorithm are context extraction, thresholding, and morphological operations..

❖ **Background Extraction:** Background Subtraction relies heavily on context extraction. When taking video on the highway, it's tough to acquire a shot without a moving car. Background extraction, also known as background or background model, is used to create such an image. Each frame is multiplied by the extracted ROI. Before being multiplied, RGB frames are converted to Gray level. As a result of this recognition, other movements such as waving leaves or any other unwanted movement are avoided. This is required in order to achieve vehicle detection accuracy. By multiplying the absolute difference of each instantaneous frame and backdrop model with the extracted ROI, only moving cars were recognized..

❖ **Thresholding:** Picture segmentation can be accomplished in a variety of ways, with thresholding being one of them. It converts a greyscale picture to a binary picture..

❖ The threshold value must be properly chosen during thresholding. Thresholding is a technique for distinguishing a moving foreground object from a static background..

❖ **Morphological Operations**: They're frequently used to remove noise caused by segmentation problems. Morphological processes are well-suited to binary pictures. As a result, they are applied to the output image of the thresholding process..

IMPLEMENTATION

Figure 1: Home Screen

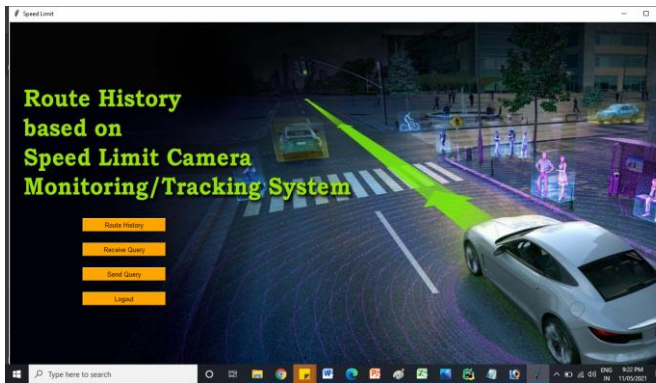

Figure 2: AdminMenu
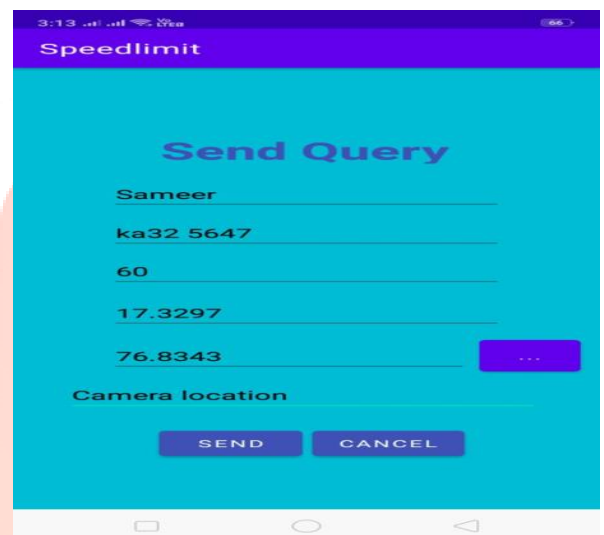

Figure 3:Route History

Figure 4:Client Login
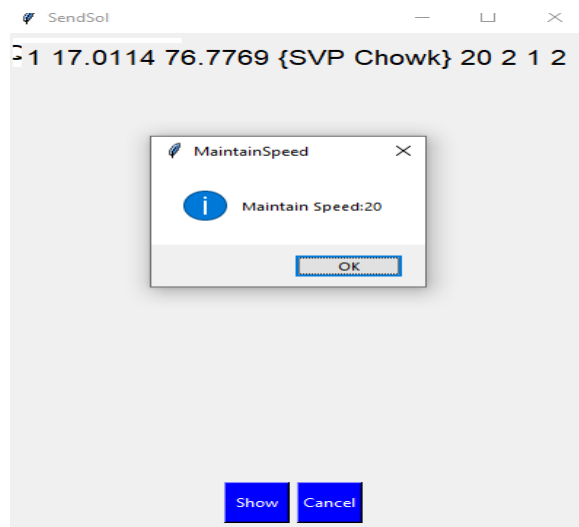

Figure 5: Send Query

Figure 6: Vehicle Detection

Figure 7 : Send Query Solution

CONCLUSION

The SaaS module as a cloud computing structure with GPS has been used to construct a prototype model for a speed compliance camera monitoring/tracking system . All of the data is transported to the cloud server using the GPS built-in system. There are a few findings that have been highlighted: The proposed method prevents injuries by ensuring that drivers are aware of speed limitations. Providing the driver with critical information such as driving speed, location, street speed, and the location of the nearest camera, among other things. Providing tourists and visitors with information on, among other things, traffic rules, road traffic signs, city fines, driving speed, and the position of the nearest camera. The proposed system has proven its capability and efficiency in a short period of time.

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