

Car Black Box

Manish Bhelande¹, Viraj Chaudhari², Prathamesh Gore³, Raj Dhure⁴, Abhishek Bhayye⁵

Asst. Professor, Dept. of Information Technology, Shah and Anchor Kutchhi Engineering College, Chembur, India¹

Student, Department of Information Technology, Shah and Anchor Kutchhi Engineering College, Chembur, India^{2,3,4,5}

Abstract: This paper discusses the configuration and functions of the Car Black Box System. This system focuses on monitoring of real-time driving and also uploads the monitored data to cloud application for further investigation in the case of an accident. This system helps the accident investigators as well as insurance companies to find out the cause of the crash. The author analyzes the problems faced in earlier models proposed and directs development to develop an integrated system with minimalistic hardware and high performance. This system uses Android Smartphone as its hardware component supported with an Android application to provide features for accident monitoring. Android Phone used as it provides all the characteristics to assist with reducing hardware use, as Android Smartphone acts an embedded system to facilitate all the features. Apart from video monitoring, other features such as navigation, speed tracking and anti-theft features are also provided in the system. The perspective of this project is to make the user feel more safety about the car and to help knowing the actual cause of accidents if any.

Keywords: Car Black Box, Android, Accident Monitoring, Open Source Technology.

I. INTRODUCTION

Nowadays operating system is not only on desktops but is available on handheld mobile devices also. In this age of mobile operating systems, various useful applications can be developed. In early days, the medium of connectivity available to people was a desktop computer and the Internet. However, nowadays people are connected everywhere which the development of cell phones. Though Personal Computers and the Internet have found revolutionary ways to connect people, to entertain them and let them exchange information, none of these can reach each person anywhere and anytime as the cell phone does.

The mobile plays a very crucial part in today's society. Google has come out with the new open, and comprehensive platform for mobile devices called Android. The platform provided by Google comprises of operating system, middleware, user interface, and applications. This concept of "Black Box" was previously used in airplanes. We are trying to implement a homogenous concept for vehicles which help us to mitigate or forestall accidents. The previously proposed models of Black Box integrated with complex hardware, which we have replaced with Android Smartphone, which obviates the need for complex hardware design and provides high functionality.

II. PROPOSED SYSTEM

Black Box is system pre-existing in airplanes for rectifying the cause of accidents by measuring the internal factors of the system. We are implementing this system in cars which help the users to know the reasons for the crash.

We are implementing this project with the support of the Open Source Technology made available by Google i.e. Android.

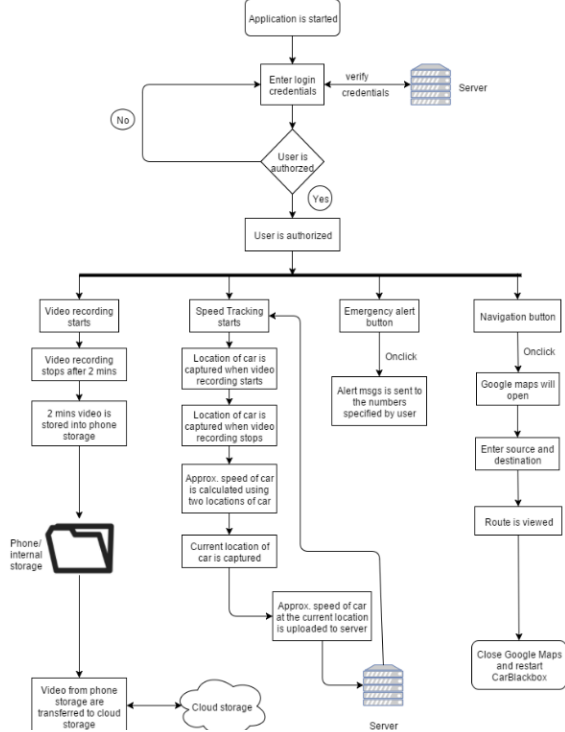
III. WORKING

1. Car Black Box is an Android Application, which can run on the Android phone.
2. When the application starts, it asks for user login. The user has to enter his login credentials provided by the Admin, then the login credentials entered by the user are verified, and the user is now authorized to use the application.
3. Once the user is permitted the Video Recording, and Speed Tracking get started immediately. Video recording is done using the rear camera of the Android Phone and after every specific interval (approx. 2mins) the video is split and stored on the Storage of the Android Phone so that we get each video of duration 2mins, this help to upload more videos on cloud storage with faster speed. [1]
4. The location of the car recorded when the video recording starts and stops respectively after a specific interval and the distance between the two location taken to calculate the approximate speed of the car between that specific duration (approx. 2mins). The speed of the car calculated along with the location (latitude, longitude) of the user is calculated and uploaded to the server.[4]
5. Contacts specified by the user are sent Emergency/Alert message when the user clicks on the Alert Button in the application. [4]
6. The Google Maps Application provides Navigation feature, for this, the navigation button is given, on clicking it Google Maps open, where the user has to enter the start point and the stop point to get the route to the destination. After viewing the route, the user has to restart the Car Black Box application so that all the features of the applications are usable to the user.
7. In case if any accident occurs and the user is unable to press the alert button, even then the car can be

tracked down using the Android Device Manager on the Android Phone.

- When the accident occurs, the videos and the approximate speed of the car at a particular time and location can be viewed to find out the reason for the crash took place.

Below illustrated is the working flow chart of the system:



IV.COMPARISION

	Old System	Our System
Hardware	Many components from chips, RAM's, Indicators, microprocessors, making complex hardware circuits.	The software integrated with simple hardware unit which is an android phone.
Data storage	Uses many devices for data storage like non-volatile memory devices which can hold a limited amount of data.	Uses the internal storage of Android device as well as the Cloud Storage, which can handle a ton's of data.
Rapid storage	The system may not be able to read and write data faster over time which results in loss of some important data.	Stores data instantly over the period in a much safer way.
Collect and process Multiple signals	Various signals, turning lights, breaking, and keeping track of it is a tough task for this system.	With video recording and reading data, the system is much better in handling such situations smoothly.

V. CONCLUSION

Nowadays due to the rapid development of Mobile Technology has resulted in the formulation of a various mobile application which helps the users in their day to day life. This Car Black Box Application aims to help Accident Investigators and Insurance Companies to perceive the cause of the accident; this should help investigators to speed up their investigation process and provide fast results.

The author solves various technical difficulties in this paper, which existed in previous models of this system.

- Real-Time Data Storage:**
In this proposed system, we have made use of phone memory and external storage options available in Android phone which helps in data storage when no internet connection is accessible to the user.
- Security Features:**
This system also makes use of the features of Android API's to provide anti-theft functionality to the vehicle.

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REFERENCES

- S. M. Jung and M. S. Lim, "System on Chip Design of Embedded Controller for Car Black Box," Information Technology Convergence, 2007. ISITC 2007. International Symposium on, Joenu, 2007, pp. 217-221.
- Q. Wu, K. Jia, and X. Li, "Study of Vehicle Video Black Box with Acceleration Sensitive Function," Multimedia and Information Technology, 2008. MMIT '08. International Conference on, Three Gorges, 2008, pp. 833-836.
- L. Jiang and C. Yu, "Design and Implementation of Car Black Box Based on Embedded System," Electrical and Control Engineering (ICECE), 2010 International Conference on, Wuhan, 2010, pp. 3537-3539.
- C. Patil, Y. Marathe, K. Amoghmath and S. S. David, "Low-Cost Black Box for Cars," India Educators' Conference (THIEC), 2013 Texas Instruments, Bangalore, 2013, pp. 49-55.
- K. Chae, D. Kim, S. Jung, J. Choi and S. Jung, "Evidence Collecting System from Car Black Boxes," Consumer Communications and Networking Conference (CCNC), 2010 7th IEEE, Las Vegas, NV, 2010, pp. 1-2.
- C. Hong, T. Le, K. Chae and S. Jung, "Evidence collection from car black boxes using smart phones," Consumer Communications and Networking Conference (CCNC), 2011 IEEE, Las Vegas, NV, 2011, pp. 836-837.
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