**6. SAFE DRIVE USING MOBILE PHONE’S**

1. **ABSTRACT**

**“Safe Drive Using Mobile Phone’s** is developed as the vehicle manufacturers continue to increase their emphasis on safety with advanced driver-as assistance systems (ADASs), we propose––++ a device that is not only already in abundance but portable enough as well to be one of the most effective multipurpose devices that are able to analyze and advise on safety conditions. Mobile smart phones today are equipped with numerous sensors that can help to aid in safety enhancements for drivers on the road. In this paper, we use the three-axis accelerometer of an Android-based smart phone to record and analyze various driver behaviors and external road conditions that could potentially be hazardous to the health of the driver, the neighboring public, and the automobile. Effective use of these data can educate a potentially dangerous driver on how to safely and efficiently operate a vehicle. With real-time analysis and auditory alerts of these factors, we can increase a driver’s overall awareness to maximize.

1. **INRODUCTION**

Analysis of external sensors data for vehicle performance is a large area of study. Some work has been done in the form of theoretical research and development in a practical design. The main ideas of our work focus on mapping anomalies of a road’s surface and classifying different driving behaviors. There has been some work in the field of road analysis, specifically road anomaly detection. Nericell is a system researched and developed by Microsoft that detects traffic honking, bumps, and vehicle braking using external sensors. For detection, it uses multiple external sensors such as a microphone, GPS, accelerometer, and Global System for Mobile communications radio for traffic localization. Pothole Patrol is another system that monitors road conditions using GPS and an external accelerometer. The system was deployed for testing in taxis using a convenient method to identify fatigued surfaces of a road. Tracking and analyzing driving behavior is an ongoing ITS study. University of California Berkeley’s Mobile Millennium project is a traffic-monitoring system that uses GPS data to obtain individual vehicle location information, process it, and distribute route information back to a mobile phone. Services presented by Wang etaIl*.* describe an infrastructure that can be used to distribute driver and vehicle information utilizing popular characteristics associated with cloud computing. Zhang etal*.* presented a pattern recognition approach to characterize drivers based on their skill level. Skill level was formed as a basic low, medium, or expert level, or a simple 1-to-10 number scale. Using a high-end vehicle simulator, they compare driver behavior such as steering control, lane changes, and traffic levels with an expert driver to help with category resolution.

Learning and classification algorithms are then used to predict the driver’s overall skill level derived from these conditions. Dai etal*.* focused on a driver’s ability to perform on the road. They proposed a technique using a mobile Smartphone to detect various driving patterns of an operator mimicking the habits of a drunk driver. When these patterns were in variable sync, it was assumed the driver was intoxicated. Phone implementation showed acceptable results for drunk driver detection and is efficient in energy consumption. Our work reveals roads to be more complex than the identification resolutions presented by both Nericell and Pothole Patrol, resulting in a wider array of classifications to reveal a particular road’s overall integrity.

We identify not only potholes but also bumps and rough, uneven, and smooth roads using multiple axes of the accelerometer. We also utilized a single measuring device rather than expensive external sensors placed in numerous places around the vehicle, which ultimately increases infrastructure costs.

Our device, which is a mobile Smartphone, contains GPS, microphones, and an accelerometer offering flexibility in methodology and user implementation. Encouraging results in identifying numerous road anomalies and sudden driving maneuvers allow for our system to evaluate an entire road’s condition and help advice drivers on unsafe characteristics, respectively, both of which are distinguishable factors that can determine safety on the road.

1. **EXISTING SYSTEM:**

The system was deployed for testing in taxis using a convenient method to identify fatigued surfaces of a road Analysis of external sensors data for vehicle performance is a large area of study. Some work has been done in the form of theoretical research and development in a practical design. The main ideas of our work focus on mapping anomalies of a road’s surface and classifying different driving behaviors. There has been some work in the field of road analysis, specifically road anomaly detection. Nericell is a system researched and developed by Microsoft that detects traffic honking, bumps, and vehicle braking using external sensors. For detection, it uses multiple external sensors such as a microphone, GPS, accelerometer, and Global System for Mobile communications radio for traffic localization. Pothole Patrol is another system.

* **DISADVANTAGES OF EXISTING SYSTEM**
* Vehicles manufactured with sensors (GPS) are hard to find in lower priced economical vehicles as ADAS packages are not cheap add-ons
* Using GPS is very expensive

1. **PROPOSED SYSTEM:**

In this paper, we use the three-axis accelerometer of an Android-based Smartphone to record and analyze various driver behaviors and external road conditions that could potentially be hazardous to the health of the driver, the neighboring public, and the automobile. Effective use of these data can educate a potentially dangerous driver on how to safely and efficiently operate a vehicle. With real-time analysis and auditory alerts of these factors, we can increase a driver’s overall awareness to maximize safety.

1. **CONCLUSION**

Using a mobile Smartphone, we have demonstrated some innovative applications that are integrated inside an automobile to evaluate a vehicle’s condition, such as gear shifts and overall road conditions, including bumps, potholes, rough road, uneven road, and smooth road. Our road classification system resulted in high accuracy, making it possible to conclude on the state of a particular road. Along with these findings, an analysis of a driver behavior for safe and sudden maneuvers, such as vehicle accelerations and lane changes, has been identified, which can advise drivers who are unaware of the risks they are potentially creating for themselves and neighboring vehicles.