ROAD CURVE ACCIDENT PREVENTION SYSTEM

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INTRODUCTION

• Driving is a complex process that involves several perceptual and motor tasks
• All over the world India bangs the top most positon in accidental deaths. Nearly 1.2 lakh of people killed every year on Indian roads
• Rollover accidents are now responsible for almost 1/3 of all highway vehicle occupant fatalities
• Rollovers tend to be more serious than other types of accidents. For light trucks and SUVs the percentage of occupant fatalities associated with rollovers is about 50%. For heavy trucks the number is about 60%. 
CAUSES OF ACCIDENT

• The common causes for vehicle accidents are driver distraction or negligence, urban location-heavily populated areas or small areas with insufficient transport facilities, vehicle handling problem and weight distribution problem.

• Accident in road curve mainly occurs when the centrifugal force is more than the direction and momentum force which makes the vehicle to move in a straight line instead of curved path.
CAUSES OF ACCIDENT

• Under estimation of speed in curved roadways may be a contributing factor necessitating speed adjustment and thus causing fatal and serious injury accidents in curves especially in heavy vehicles.

• As the result of approaching sharp curves without realizing that current speed is dangerous to passing through the curve, when driver fails to decelerate while just realizing that, the driver feels a tense moment and traffic incidents may occur.
FORCES INVOLVED IN ROAD CURVES

- while taking a curve three types forces are involved they are directional force momentum force and centrifugal force. Centrifugal force comes into play when you're rounding a curve. It tends to pull your vehicle out away from the inside edge, regardless of which direction you're traveling.

- If a car on the "inside" lane of a curve tries to navigate with too much speed, centrifugal force will pull it away from the center and potentially, into the path of oncoming traffic.
• Or, if a car is travelling with too much speed from the other direction—in the "outside" lane of a curve—centrifugal force will pull it out to the right and off the roadway.
AIM OF OUR PROJECT

• Our main aim is to reduce the accident by intimating the driver about the load carried on vehicle and also decelerating automatically when displacement sensor detects turns and bends.

• It is done by reducing fuel flow to the engine in accordance with load carried on the vehicle automatically.
• This gadget includes load sensors, displacement sensor, engine control unit and camera which can function at all environmental conditions with recording system.

• The load sensor calculates the load carried by the vehicle and the displacement sensor will calculate the distance of the road curve and engine control unit receives the information from both sensors and deaccelerate the vehicle accordingly.
METHODOLOGY
The type of displacement sensor we are going to use is ultrasonic sensor which can accurately erect the object and measure the distance between them by transmitting a short burst of ultrasonic sound toward a target.

When the sound is reflected, it returns to the sensor as an echo. The distance between the ultrasonic linear position sensor and is calculated from the signal's return time.
A variety of materials can be measured, including transparent and Reflective objects. Measurements are performed with no contact, so even highly-viscous liquids are no problem. Since the sensor uses ultrasonic sound it is not affected by the colour of the object.
• Speed sensor used here for velocity measurement purpose.

• Wheel speed sensor or vehicle speed sensor (VSS) is a type of tachometer which is a sender device used for reading the speed of vehicle on basis of wheel rotation

• The speed values derived by the speed sensor is used by the engine control unit in order to generate command to reduce the vehicle speed accordingly.
LOAD SENSOR

• Load sensors are introduced in the vehicle to calculate the total load carried on the vehicle. The load sensors are kept at the place where the chassis and the vehicle frame are in contact.

• This calculation will be done in a periodical time so that the gradual derived results are noted down and then they are sent to the engine control unit.

• The load/weight data obtained from the sensor shows the pressure generated on the spring which are resulted from the distance changes from the suspension system of the vehicle.
DAY AND NIGHT VISION CAMERA

- Day/night vision camera can produce a clear image in total darkness
- This technology allows objects hidden behind obstacles such as smoke, fog or even plywood to be captured as live, moving images so this helps the driver to drive flawless in all conditions.

a) normal view  
b) Camera view
ROLL OVER PREVENTION METER:

- Roll over prevention meter has an engine control unit in which all above sensors and camera (load sensor, speed sensor, displacement sensor & night vision cameras) are interfaced.

- The function of the sensors is controlled by the engine control unit.

- This device gets activated when the displacement sensor finds a road curve ahead the vehicle and the information from the three sensors is processed by the engine control unit.

- While taking a curve, the speed of the vehicle is more than the speed required for taking the curve. The engine control unit will automatically reduce the speed by decreasing the fuel flow rate supplied from the tank to the engine.

- It also alerts the driver in form of LED lights and buzzers.
Conclusion:

- Analysis and design of rollover meter is presented. The proposed system is used to avoid various road curve accidents which are caused due to speeding and loss of control.

- This system will sense and measure different parameters like road curve distance, load on the vehicle, and speed of the vehicle.

- The above measures parameters help to reduce accidents in road curve. Thus, it makes the public transport more efficient & effective.
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THANK YOU