

Abstract

Mohamed Saad Zaghloul

Design of Open Architecture System to Reduce the Likelihood of a Vehicle Getting Stolen Carjacking

This paper is a practical design and implementation of an electronic protection system for protection from motor vehicle theft and safety for the driver. It is a specific form of computer-based information system that complies with International safety regulations and can be used in any types of cars, ships, trains, and airplanes. Nationwide in the US in 2005, there were an estimated 1.2 million motor vehicle thefts, or approximately 416.7 motor vehicles stolen for every 100,000 inhabitants. (Federal Bureau of Investigation, 2009) It can be interfaced with navigation, control system for the protected vehicles. The system can control and displays information of controlled vehicles which can be powered for the fuel pump, electricity for the ignition system, audio and visual alarms others. The designed system can prevent the operation of the engine unless the right store code is entered, also it can let the engine operate only for certain specific previously determined time, reduce the speed of the engine at certain conditions stop the engine completely in case of danger for example if the driver fell into sleep in this case in our design depending on gyro as a sensor for that. It may also display additional navigation-related information, such as Sailing Directions, speed, remains fuel. The system is powered by 12 V dc supply available in all types of vehicles, to start operation to enter the password for the key board. Further, it was demonstrated that the program is used in actual work for the system to the microcontroller type 16F84A. The software is preferred for design using software PIC Basic for microcontroller. This Program is a window based Software and friendly user. To detect the driver sleep, different techniques can be employed such as camera day night, passive infrared detector, muscle sensor (neck hand), flex pressure sensor, gyro on head (mechanical), and mind activity sensation. A gyro can be designed with USB interface, in which compass model was designed with Honeywell's HMC5883L 3 axis magnetometer I2C, 2.7 to 6.5 V TTL-USB and microcontroller 16F877, in addition, it was able to electrically resolve better than 0.1 degree rotation and accuracy from 1 to 2 degree. The output from this gyro model is taken via USB port for monitoring purpose and through a relay used as one of the controls to the microcontroller type 16F84A which will result in the required action like reducing the speed stopping engine. Our design covers various methods of prevention to reduce the likelihood of a vehicle getting stolen. These include physical barriers, which make the effort of stealing the vehicle more difficult by allowing the vehicle to start only if the right password contains the correct code which is present in the stored microcontroller to give start signal for ignition. Adding to those chances of theft can also be reduced with various deterrents which give the impression to the thief that she/he is more likely to get caught if the vehicle is stolen including: car alarm systems that are triggered if a breaking and entry into the vehicle occurs and trying to start the engine. Kill switch circuits were designed to frustrate slow down the efforts of a determined car thief. Kill switches are located between crucial parts of the starting system, between the battery source and the coil, the fuel pump. A car cannot start without first flipping these kill switches to closed position hid in obscured areas, under the dashboard, beneath the seat, behind a chair etc