ABANTE: Arduino-Based Anti-Theft Engine Control by Alcohol-Sensing and Accident Preventive Helmet

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Motorcycle-related accidents are one of the major problems in the Philippines; most of these are caused by driving under the influence of alcohol and the absence of helmets. Also, motorcycle theft is a widespread issue that ranks third among all kinds of robbery. With the integration of various Arduino-based sensors, researchers had developed a helmet that can aid accident prevention and strengthen law enforcement. There are several conditions that are needed to be satisfied to start the ignition of the engine: helmet is worn, fingerprint matches the database, and the rider is not under the influence of alcohol. If one of the said conditions is not met, the engine will not turn on. Another remarkable feature of the project is the text messaging alert system using the GSM GPRS SIM900A. If a sudden impact towards the head is detected by the shock sensor, a text message will be sent to alert the chosen contact. Additionally, if the alcohol sensor detected that the rider is drunk, a text message will also be sent to the chosen contact indicating that the rider is unable to drive. Various tests of calibration and testing were conducted. By multiple trials, the results show that Arduino-based components are effective in designing an accident-preventive helmet.

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