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A Convolutional Neural Network Based Vehicle Theft Detection, Location, and Reporting System

Authors : Michael Moeti, Khuliso Sigama, Thapelo Samuel Matlala

Abstract : One of the principal challenges that the world is confronted with is insecurity. The crime rate is increasing exponentially, and protecting our physical assets especially in the motorist industry, is becoming impossible when applying our own strength. The need to develop technological solutions that detect and report theft without any human interference is inevitable. This is critical, especially for vehicle owners, to ensure theft detection and speedy identification towards recovery efforts in cases where a vehicle is missing or attempted theft is taking place. The vehicle theft detection system uses Convolutional Neural Network (CNN) to recognize the driver's face captured using an installed mobile phone device. The location identification function uses a Global Positioning System (GPS) to determine the real-time location of the vehicle. Upon identification of the location, Global System for Mobile Communications (GSM) technology is used to report or notify the vehicle owner about the whereabouts of the vehicle. The installed mobile app was implemented by making use of python as it is undoubtedly the best choice in machine learning. It allows easy access to machine learning algorithms through its widely developed library ecosystem. The graphical user interface was developed by making use of JAVA as it is better suited for mobile development. Google's online database (Firebase) was used as a means of storage for the application. The system integration test was performed using a simple percentage analysis. Sixty (60) vehicle owners participated in this study as a sample, and questionnaires were used in order to establish the acceptability of the system developed. The result indicates the efficiency of the proposed system, and consequently, the paper proposes the use of the system can effectively monitor the vehicle at any given place, even if it is driven outside its normal jurisdiction. More so, the system can be used as a database to detect, locate and report missing vehicles to different security agencies.

Keywords : CNN, location identification, tracking, GPS, GSM
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