Safety Locator: Crime Rate and Hot Spot Prediction System for Woman using Multimodal Deep Learning

Abstract

Crime hotspot is a geographic area or location that experiences a higher rate of criminal activity compared to other areas within the same region. These hotspots where women are more likely to experience criminal activities such as sexual harassment, assault, domestic violence, stalking, and human trafficking. The identification of crime hotspots is an essential aspect of crime prevention and control. It enables law enforcement agencies to focus their resources on the areas with the highest crime rates and develop targeted interventions that address the underlying causes of criminal activity. Crime hot spot prediction is an important problem in public safety, and machine learning algorithms such as Deep Explainable Decision Tree is a predictive model designed to identify crime hotspots against women and provide a map of these locations using Google Maps. The proposed system employs Deep Explainable Decision Tree, a machine learning algorithm that analyzes and classifies data into different categories. The model is trained using historical crime data and is capable of predicting the likelihood of a crime occurring in a specific area. The system then generates a map of the predicted crime hotspots using Google Maps. Crime hotspots can be identified through the analysis of crime data, including the number and type of crimes reported, the time of day or week when crimes occur, and the location of the crime. Additionally, the map generated by the system can be shared with the public to raise awareness of the areas that require extra caution. The system involves data pre-processing, feature selection, model training, model evaluation, hyper parameter tuning, and prediction. The DT model is a binary classifier that separates crime hot spots from non-crime hot spots using a hyperplane. The performance of the model is evaluated using metrics such as accuracy, precision, recall, and F1-score. The hyper parameters of the DT model are tuned using cross-validation. The system can be used by law enforcement agencies to prevent crime and improve public safety by identifying areas where crime is most likely to occur. The proposed system can play a crucial role in improving women's safety and

promoting gender equality by creating safer environments for women to live, work, and thrive in.

Algorithm

XAI

Decision Tree

Technology Stack

Server Side : Python 3.7.4(64-bit) or (32-bit)

Client Side : HTML, CSS, Bootstrap

IDE : Flask 1.1.1

Back end : MySQL 5.

Server : Wampserver 2i

DL DLL : TensorFlow, Pandas, SiKit Learn