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Recognizing signs of violence based on artificial intelligence techniques

A Graduate Project Submitted to the department of Information Security of the College of Information Technology, University of Babylon, in Partial Fulfillment of the Requirements for the Bachelor's degree in the Information Security of Information Technology.

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Abstract

Hand gesture recognition and body tracking through artificial intelligence techniques is a rapidly developing field with diverse applications. Artificial intelligence techniques, especially deep learning models, are increasingly being used to detect violence in various environments. Furthermore, using regular cameras to recognize signs of violence in real-time through a combination of mathematics-based algorithms and deep learning models has shown promising results, achieving high accuracy without the need for special sensors.

This project explores the issue of violence that can occur in various settings and times, leaving individuals feeling helpless and unable to act except through hand movements, which serve as the optimal and safest recourse for the victim. When faced with such circumstances, the victim may Sign for help or alert using hand gestures such as “Help,” “Call police,” gestures, Recognizing these signs is an important constant for maintaining public security and safety.

The second stage of the proposed project after recognizing hand gestures is the possibility of tracking if a case of violence is detected by taking a picture of the abused person and giving an alarm, in addition to the possibility of tracking the person’s skeletal, which makes it an integrated system for tracking any case of violence.

This endeavor relies on the use of a distinct AI algorithm, the Long Short-Term Memory (LSTM) algorithm. While working with this algorithm in this project, a synergistic effect was achieved to enhance the accuracy of detection and tracking operations. The implementation of this algorithm has proven its effectiveness and speed in detection tasks. The LSTM algorithm showed a detection accuracy rate of 95% .

In this project, gestures were used “Help,” “Call police,” which we configured according to the needs of the project