Internet of Things-Based Facial Recognition Attendance System Using the K-Nearest Neighbor (K-NN) Method

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ABSTRACT

Attendance is an activity to document a person's presence in an activity. However, conventional attendance has several shortcomings such as requiring a long time, having the potential for fraud and data manipulation, and difficulties in managing attendance data recapitulation. Therefore, an Internet of Things-based facial recognition attendance system was created using the K-Nearest Neighbor method to improve attendance quality, reduce fraud, and simplify attendance data management. The system consists of a facial recognition application program that can be accessed through a computer connected to a webcam, a MySQL database as a database for storing user data and attendance data, and a Web application interface with a Flask framework used to control the attendance system. The facial recognition attendance system uses the K-Nearest Neighbor (K-NN) model to perform facial identification. The attendance system is also equipped with verification by blinking and showing teeth to reduce fraud. Attendance data is automatically stored in a MySQL database and stored in a CSV file. The designed attendance system can run well. The facial recognition system program, database, and Website application interface with the Flask framework are well connected to each other to create a structured attendance system. The system's average accuracy in recognizing user faces was 89.6%, with an average recognition time of 0.85 seconds.

Keywords*: Presence, Face Recognition, K-Nearest Neighbor*