ABSTRACT

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The manual and GPS-based attendance system in the S-Learn application at Politeknik Negeri Jember is vulnerable to fraud such as proxy attendance and location spoofing. This study implements a biometric attendance system based on face recognition using RetinaFace for face detection, ArcFace for feature extraction, and cosine similarity for identity verification. The system is integrated into the S-Learn application with a client-server architecture using Flutter as the mobile interface and Flask as the backend. Testing across various environmental conditions showed that the system achieved a 100% pass rate for genuine users with an average cosine similarity of 0.8801, and successfully rejected all identity spoofing attempts (impostors) with an average score of 0.1275 using a threshold of 0.37. The average verification time was 701 ms. User Acceptance Testing (UAT) results demonstrated a high acceptance rate with an average Likert score of 4.58 out of 5 and an NPS of 8.6, with 100% of respondents stating the system is ready for use. This system is proven effective in improving attendance validity and reducing potential fraud in digital attendance.

Keywords: biometric attendance, face recognition, ArcFace, RetinaFace, cosine similarity, S-Learn.