ABSTRACT

Telkom Institute of Technology is an institution based on technology which has to be imperative for IT Telkom to provide technology-based services. A problem which often encountered is a presence system at IT Telkom which isn't still based on technology yet. That is a presence system which is used a signature as a presence sign.

This final project aims to implement a presence system based on biometric which the presence sign can't be represented by someone else and it should be done by own selves. This verification system is be able to recognize human face, identify student's name, and identify student's number (NIM) which are processed in offline and real time/online. The system is made using a webcam as a medium for acquiring the image and MATLAB as a software to build an application program of the system. The feature of the image that is acquired by a webcam is processed to be a hyper spectral image in pre-processing and then extracted with spectral eigenface method and then it is classified for recognition with k-Nearest Neighbor (k-NN), and the last, the output of the system are student's name and student's number (NIM).

Based on the result of performance testing system, it is known that the performance of the offline system reaches the highest accuracy when the classification type is Cosine Distance when k=3 and the accuracy that is obtained by the system is 97,980% and computation time of the system is 2,284584 seconds. And the result of performance testing system in real time is when the classification type is Euclidean Distance with k=3 and the accuracy that is obtained by the system is 81,818% and computation time of the system is 1,02475 seconds.

Keywords: biometric, *hyper spectral, spectral eigenface, k-Nearest Neighbor* (k-NN)