

ABSTRACT

Visual identification is one of the most commonly applied method in forensic science. The biometric that usually used in this method is fingerprints. Unfortunately, this biometric can be easily damaged by inflammation, trauma, and factor of age. Palatal rugae or commonly called rugae palatine refers to the number of transverse ridges located in the anterior of human palatal at maxilla. Palatal rugae pattern is different for each individual, even in twins. The internal positions of palatal rugae in oral cavity makes palatal rugae protected from injury, fire, and the decomposition, thus taking an important role in forensic identification.

This research implements Discrete Wavelet Transform (DWT) as feature extraction method and Backpropagation-Artificial Neural Network (ANN) as classification methods. DWT is generally a subband decomposition of the image by passing it through highpass and lowpass filter. Meanwhile, ANN is an information processing system that has similar characteristics to biological neural networks. Backpropagation –ANN is one of the popular networking model on artificial neural networks because of its ability in solving a problem related to the identification, prediction, and pattern recognition and also fault tolerance.

The result of this project is an accurate and robust personal identification program based on the pattern of palatal rugae. The program is expected to be an alternative tool in personal identification in forensic science, medicine, and the population basic data. Based on this research, the accuracy of the system is 97.50% using 3 hidden neurons, value of $\mu=0.0016$, and image size=100×100. This system is robust to various noises and motion blur.

Keywords: *Palatal Rugae, Biometrics, DWT, ANN-Backpropagation*