

## **ABSTRACT**

*Forensic science commonly used for individual identification in Indonesia is fingerprint. But, on certain condition fingerprint cannot be processed properly and hard to identify. On the development of forensic science, tooth enamel has similar pattern to fingerprint that can be used for individual identification with high validity and reliability. The advantages of using tooth enamel for identification are: they rot slowly, they withstand high temperature, the pattern is clear and easy to recognize, and they are protected by lips and cheeks.*

*This final project discusses the techniques for identifying tooth enamel patterns by using image processing. Features extraction method used is Histogram of Oriented Gradient (HOG) and for classification process used Self Organizing Maps (SOM). There are 4 main steps process which are image acquisition, image processing, feature extraction, and classification. Hopefully this thesis will be to assist forensic odontology using Matlab that can perform the process of individual identification.*

*Parameters measured are accuracy and computation time. With 100 samples of training image and 200 samples of testing image, collaboration of HOG method and SOM classification system has been able to do the process of enamel rod but not optimal. For this final project the system get the best performance of 79.5% with an average computation time of 27.7328 seconds.*

**Keywords :** *Tooth Enamel, Histogram of Oriented Gradient (HOG), Self-Organizing Maps (SOM)*