

## ABSTRACT

Cigarette contains nicotine substance that can make people addicted to it. Addicted to alcohol, drugs, and cigarette can influence the relax condition of the consumer. Relax condition can be observed using EEG. EEG or Electroencephalograph is an activity to record electric neuron brain activity. EEG is often used to analyze brain activity and predict the result of the emotion. EEG is expected to be able to observe the relax condition of active smoker.

In this final task, a system built to classify the relax condition of active smokers based on analysis of alpha and beta EEG signal. K-Nearest Neighbor (K-NN) used as condition classify method. Besides, to improve the performance of the system, Principal Component Analysis (PCA) is used as extraction feature to reduce the dimension of EEG dataset.

The test results show the best accuracy on alpha signal obtained with a value of 90% and on the beta signal obtained with a value of 96.67%. And cross-correlation results indicate that each test data is similar to the train data, with an average of 83.33% in the alpha signal and 90% in the beta signal. So it can be concluded that the brain signals of people who are smoking tend to be detected as a brain signal of people on relaxed conditions.

**Keyword** : *Cigarette, Electroencephalograph, Principal Component Analysis, K-Nearest Neighbor.*