

## **ABSTRACT**

Traditional musical instruments is the cultural heritage of the ancestors of Indonesia which must be preserved, one example of a traditional musical instrument or commonly referred bali gamelan. Balinese gamelan is a kind of musical instruments owned by the local Balinese community. The human ear is also likely to have limitations so not all types of instruments can be heard clearly. Because it is in need of a system that can be used to detect the type of musical instruments and tones that issued the instrument so that it can be a method of learning Balinese gamelan.

In this Final Duty will be created a system that can detect the tone of the four types of Balinese traditional music instrument with a spectral clustering method, Principal Component Analysis (PCA) and timbre identification. The process begins with the input voice data, framing, STFT, spectral clustering, PCA, timbre models, timbre matching. The output of this system of classification results for the tone and type of Balinese gamelan instruments in which the four types of instruments contained in the class classification that is kempluk, ugal, gangsa and kantil.

From the simulation results that have been designed system obtained an accuracy of 100% training data of a total of 122 training data and the accuracy of test data for 91.3% of the total of 184 test data. Accuracy of the results obtained show that the system is able to distinguish types of tone from each musical instrument, so the system can help the learning process of traditional Balinese musical instruments.

**Key words:** Tone detection, Spectral clustering, Principal Component Analysis (PCA), Timbre identification