# ABSTRACT

A medical instrument used for checking health condition of human is stethoscope. Human lung sound can be heard by using stethoscope. This method is called auscultation. However, in clinical practice, some difficulties are verified, such as surroundings noise, sensitivity of the ears, low level in amplitude and frequency, and some identical sounds. The condition of lung can be informed by sound generated from it. The sound is usually compared with sound of normal lung. If there is a difference between one sound and normal condition sound, lung has a disorder function. The abnormal sounds are often hard to differ from the normal sounds by using the ears. For that reason, a digital signal processing is needed to differ the sounds.

This final project does a task of feature extraction of *Bronchial, Vesicular, Crackels, Grunting, Friction,* and *Asthma* sounds using *Short Time Fourier Transform* (STFT). Spectrogram is the output of STFT. Then Bilateral Filter removes the *noise* of extracted sound. *Linear Discriminant Analysis* and *K-means Clustering* are the classifier used to compare the performance.

Result of system examination used 3 comparison parameters of the algorithm, that is system accuracy, sensitivity of system and speed of system in examination. LDA shows an accuracy in the value of 96.67% for system without filter and 100% for system with filter inside. *K-means* reaches the point of 100% in system without filter and 93.33% for without filter. This result shows that both *supervised* classification and *unsupervised* recognition have their own role to process data.

Keyword : *noise, auscultation,* Bilateral Filter 2D*, spectrogram, Short Time Fourier Transform, classifier, K-means Clustering, Linear Discriminant Analysis, supervised, unsupervised*