

## ABSTRACT

Obstructive Sleep Apnea (OSA) is a sleep-related breathing disorder that involves a decrease or complete cessation of airflow despite sustained attempts to breath. The majority of people with OSA often snore loudly, with periods of pauses when airflow is reduced or blocked. The prevalence of OSA is 4% in men and 2% in middle-aged women. With age, the prevalence increases by about 28% -67% for men and 20% -54% for elderly women. Therefore, deep learning is needed to help the medical world to easily detect OSA.

This final project aims to detect Sleep Apnea based on electrocardiogram (ECG) signals using RNN algorithm analysis. The sleep apnea Dataset will be classified into 2 classes namely normal and sleep apnea. This study uses RNN because it is able to store memory that allows to recognize data patterns well, then use it to make accurate predictions. The system is designed using Google Colab platform with Python programming language and its own dataset obtained from [www.github.com](http://www.github.com) it's called Sleep Apnea Detection.

In this final project, 4 hyperparameters are used for testing, namely optimizer, learning rate, batch size, and epoch. The dataset in this study amounted to 16,612 data which were classified into 2, namely 0 for normal and 1 for sleep apnea sufferers. The best parameters obtained from the scenario test are using epoch 100, learning rate of 0,01, batch size of 32, and Adam optimizer. The best accuracy results are obtained in model three with the specification of 50 LSTM filter and using maxpooling with a final accuracy of 60,13% and a loss of 0,6743.

**Keywords:** ECG, Recurrent Neural Network (RNN), Sleep Apnea