ABSTRACT

From several parts of human body, there is an important part that control res-piration, namely the lungs. Respiration for human being is used to take out carbon dioxide and take in oxygen that is used to activate cells that have important role in human body. Total respiration measurement that happened in a certain amount of time is called respiration rate, this thing can be used to decide the healthines condi-tion of body, age, and even activity that a person currently do. Due to that fact, the measurement of respiration rate is an important thing to do and a tool that could measure that thing practically and efficient is needed.

System that is proposed by this final project used an android smartphone with builtin Inertial Measurement Unit (IMU) sensor that consist of accelerometer and gyroscope. The whole point of this system is to measure total respiration that hap-pened in a certain amount of time, so called respiration rate by observing the move-ment of the IMU sensor in the android smartphone that moved according to chest movement for when inflation and deflation of the lungs happened.

With the proposed system, the algorithm in this final project achieve around 85% of accuracy to measure the respiration rate with MAPE (Mean Absolute Per-centage Error) value of 20,29% on crowdsource dataset, and 13,21% on internal dataset and also the the system can be used stably (shown by the result of algorithm conversion in javascript that is 100% equal with the original algorithm in octave) without any obstacle in using it.

Keywords: *respiration rate, IMU sensor, accelerometer, gyroscope, android.*