

ABSTRACT

Radio Detection and Ranging (radar) is a system that is used as an object detector that uses electromagnetic waves to identify the distance, direction or speed of an object. Radar technology has many uses in various fields such as military, shipping, aviation, weather information and medical. One of the benefits in the medical field is the measurement of human vital signs (breathing, heart rate) which can be identified based on a small shift indicator.

One type of radar based on the signal sent is Frequency Modulated Continuous Wave (FMCW). FMCW radar is a type of radar with continuous signal, where the sinusoidal signal is modulated by frequency. Software Defined Radio (SDR) is a development of radio technology for testing radar signal processing systems. The parameters of the SDR can be set and configured according to needs so that the use of radar technology can be more flexible.

In this final project, the implementation of the FMCW radar system is tested with a working frequency of 2.4 GHz. In this test, the RF Blade is connected to a monopole antenna as a transmitter and receiver to measure small shifts in the abdominal wall. In this test, 3 different scenarios were carried out by measuring immovable objects, breathing 6 times and 11 times for 10 seconds. From the measurement results in the time domain, small shifts were detected at different times. In the first scenario no small shift was detected, in the second scenario a small shift was detected at $1.118 \times 10^5 \mu\text{s}$, and in the third scenario a small shift was detected at $0.83 \times 10^5 \mu\text{s}$ and $1.67 \times 10^5 \mu\text{s}$.

Keywords: *Respiratory rate, FMCW Radar, SDRadar.*