

ABSTRACT

Self driving car is a car that can drive with automatic steering. To be able run properly, a self driving car requires a radar system on the car. However, the propagation of the radar signal does not escape from multipath propagation interference. Multipath propagation occurs when a radar receiver will receive many signals that take different paths due to reflections from other objects around a target that are close to the main path. Multipath propagation generated from various signal paths can certainly cause interference with radar detection.

This Final Project analyzes the effect of propagation multipath on self driving car radar system which performs the detection by signal simulation method with a software. Vehicle radar system applications use Long Range Radar with Frequency Modulated Continuous Wave (FMCW) signal types. Detecting target distance by the FMCW radar system by getting beat frequency from the Fast Fourier Transform (FFT) process and detecting target velocity using the Doppler frequency.

From the simulation results of the FMCW radar system that has been designed it is proven to be able to detect the target range and velocity well. While the multipath propagation effect is proven to reduce radar performance with range detection accuracy affected by three multipaths are 94.18469%, five multipaths are 88.33074%, and eight multipaths are 79.54567%. It can be concluded that the more propagation of multipath smaller the accuracy of detecting the target range by the radar.

Keywords : *Doppler, FMCW Radar, Multipath, Self Driving Car*