ABSTRACT

Radar (radio detection and ranging) is a system that functions to detect, measure distance, altitude, and map an object that is around the radar monitor. Basiclly radar has three functions, that is for detection, tracking, and image. However, the detection process is often the signal received by the radar does not always come from the target, but can also come from interference. The interference is a signal that is not desired by the radar receiver.

CFAR is a detection algorithm that can be used by radar to detect targets in a homogeneous and heterogeneous noise. By using the CFAR algorithm, the threshold is made to be adaptive by adjusting the noise power that is on the reference cell.

In this final project, we will simulate three CFAR detectors, namely cell averaging (CA-CFAR), greatest-of (GOCA-CFAR), and smallest-of (SOCA-CFAR). This simulation will use the parameter of P_{Fa} 10^{-2}, 10^{-3}, 10^{-4}; N *bin* = 10000 *bin*; *reference cell* = 20; dan *guard cell* = 3. To see the performance of each detector will be tested with homogeneous and heterogeneous noise.

From the simulation results that have been done, the CA-CFAR, GOCA-CFAR, and SOCA-CFAR detectors can maintain false alarm levels well when testing homogeneous noise. When comparing CA-CFAR detectors with GOCA-CFAR detectors, CA-CFAR detectors have decreased performance, which is a false alarm when testing heterogeneous noise, especially when the threshold passes through the clutter region. If the GOCA-CFAR detector is compared to the SOCA-CFAR detector, the SOCA-CFAR detector can detect two targets that are closely for homogeneous and heterogeneous noise conditions, but the SOCA-CFAR detector still can't avoid false alarms caused by clutter region.

Keyword : *Radar detection, cell-averaging* CFAR,*smallest-of* CFAR, *greatest-of* CFAR, *false alarm.*