FORWARD SCATTERING RADAR (FSR) TARGET SIGNAL PROCESSING USING WAVELET TECHNIQUE (WT)

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ABSTRACT

Micro-sensor Forward Scattering Radar (FSR) is a network system that been used to detect and classify any ground target (personnel, vehicle) that crossing by or entering the coverage or restricted area. The efficiency of the classification performance is highly dependent on the information extracted from the signal. The choice of transformation techniques which can reveal the information of the target should be chosen carefully. Hence, this research will looks into Wavelet Technique (WT) which give scales and variation information respectively. This information will be extracted and become the input to the classification process. The result from the wavelet technique shows that we can find the similarity between signals of each target and dissimilarity between different targets.

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CHAPTER 1

INTRODUCTION

1.1   BACKGROUND

The phenomenon of electromagnetic wave forward scattering (FS) has been investigated since many years in geometrical optics and physical optics. The first experiment of radio wave propagation were undertaken many times and discovered the radio wave propagation in forward direction phenomenon [1]. Several countries including Japan, US, UK, Germany, Russia had used the concept of FS in their radar network during World War II [2].

In RADAR network, it mainly focused on covering area that had been designed, mostly in restricted area or hazardous area. One of the technologies that have been used in this network is micro-sensors Forward Scattering Radar (FSR). Forward Scattering Radar (FSR) had been widely used in radar network for security and safety used. FSR has its own fundamental characteristics which are: better targets cross-sections, heftiness to stealth targets, absence of signal fluctuations and reasonably simple hardware [3]. These characteristics are applied in many situations; one of them is ground operations. Recently, micro-sensor FSR wireless network has been presented for awareness in ground operations [3]. The main objectives of FSR are the detection, parameter estimation (for example speed) and automatic target classification (ATC) of numerous ground targets (whether personnel or vehicles) entering or crossing its coverage area.