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Small Target Detection In A Radar Surveillance System

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Abstract: *Radar surveillance systems play a crucial role in detecting and tracking targets in various environments. However, detecting small targets, such as drones or missiles, poses significant challenges due to their low radar cross-section (RCS) and the presence of clutter. This seminar report discusses the techniques and challenges of small target detection in radar surveillance systems.*

We explore various techniques, including pulse Doppler radar, Constant False Alarm Rate (CFAR) detection, clutter maps, and machine learning algorithms, to improve detection performance. The report also discusses different types of radar systems, such as phased array radar, pulse compression radar, and MIMO radar, and their applications in air defense, surveillance, and border security.

The report highlights the importance of advanced signal processing techniques, multimodal sensing, and cognitive radar in improving small target detection performance. It also discusses the challenges and future directions in this field, including the development of more sophisticated algorithms and systems to detect and track small targets in complex environments..

Keywords: *Pulse Doppler Radar, CFAR Detection, Machine Learning*

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