A New Distributed CFAR Processor

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ABSTRACT

In the multi-sensor information fusion system, since the centralized CFAR processors bring an overload communication burden, the distributed CFAR becomes a developing and important field. A new OSCA CFAR processor using distributed sensors is presented in this paper. In the scheme, each sensor transmits its test sample and a designated order statistic (OS) of its surrounding observations to the fusion center. At the fusion center, the test samples and the order statistic quantities are combined with the cell average algorithm (CA) respectively to make the final decision. For a Rayleigh fluctuating target in Gaussian noise of unknown level, we obtain its closed-form expressions for the false alarm probability and the detection probability. The numerical results indicate that the detection performance of the prop osed OSCA scheme is very close to that of the ideal centralized CFAR, and considerably better than other distributed CFAR processors.

Keywords: Distributed Processor, CFAR, Scaling Factor, Detection Probability, False Alarm Probability.