

Non-sinusoidal micro-Doppler components extraction based on dual-branch network

Jie Lu¹, Wenpeng Zhang², Yongxiang Liu², and Wei Yang²

¹National University of Defense Technology

²National University of Defense Technology College of Electronic Science and Technology

June 20, 2022

Abstract

Fine target status can be represented by the extracted micro-Doppler (m-D) components from the radar echo. However, current methods do not consider the specialty of the m-D components and their performance to irregular components are poor. In this paper, neural network is applied to m-D signal extraction for the first time. Specifically, a novel and effective dual-branch network based m-D components extraction method is proposed. The dual-branch network consisting of a continuous m-D components extraction branch and a crossing point detection branch is designed to obtain components and cross points at the same time. To solve the error correlation problem of multi-component signals, the first-order parametric continuous condition and cubic spline interpolation are employed to obtain complete and smooth components curves. Simulation and measurement results show that this method of good robustness is a good candidate to separate the non-sinusoidal m-D components with intersections.

Hosted file

Non-sinusoidal micro-Doppler components extraction based on dual-branch network.docx available at <https://authorea.com/users/490167/articles/573640-non-sinusoidal-micro-doppler-components-extraction-based-on-dual-branch-network>