

ICanny: CNN Modulation Recognition Algorithm

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Abstract : Aiming at the low recognition rate on the composite signal modulation in low signal to noise ratio (SNR), this paper proposes a modulation recognition algorithm based on ICanny-CNN. Firstly, the radar signal is transformed into the time-frequency image by Choi-Williams Distribution (CWD). Secondly, we propose an image processing algorithm using the Guided Filter and the threshold selection method, which is combined with the hole filling and the mask operation. Finally, the shallow convolutional neural network (CNN) is combined with the idea of the depth-wise convolution (Dw Conv) and the point-wise convolution (Pw Conv). The proposed CNN is designed to complete image classification and realize modulation recognition of radar signal. The simulation results show that the proposed algorithm can reach 90.83% at 0dB and 71.52% at -8dB. Therefore, the proposed algorithm has a good classification and anti-noise performance in radar signal modulation recognition and other fields.

Keywords : modulation recognition, image processing, composite signal, improved Canny algorithm

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