عنوان مقاله:

Tracking Performance of Semi-Supervised Large MarginClassifiers in Automatic Modulation Classification

محل انتشار:

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خلاصه مقاله:

Automatic modulation classification (AMC) in detected signals is an intermediate step between signal detection and demodulation, and is also an essential task for an intelligent receiver in various civil and military applications. In this paper, we propose a semi-supervised Large margin AMC and evaluate it on tracking the received signal to noise ratio (SNR) changes to classify most popular single carrier modulations in non-stationary environments. To achieve this objective, two structures for self-training of large margin classifiers were developed in additive white Gaussian noise (AWGN) channels with priori unknown SNR. A suitable combination of the higher order statistics (HOS) and instantaneous characteristics of digital modulation are selected as effective features. We investigated the robustness of the proposed classifiers with respect to different SNRs of the received signals via simulation results and we have shown that adding unlabeled input samples to the training set, improve the tracking capacity of the presented system to robust against environmental SNR changes. The performance of the automatic modulation classifier is presented in the form of k-fold cross-validation test, classification accuracy and confusion matrix methods. Simulation results show that the proposed approach is capable to classify the modulation class in unknown variable noise environment at even low SNRs.

کلمات کلیدی:

Automatic Modulation Classification; AMC; Tracking Performance Evaluation; Passive-Aggressive Classifier; Self Training; Semi-Supervised Learning