

SĂRARU, Corina; STATE, Luminița; OPTIMIZED CLASSIFIER DESIGN USING WAVELETS AND INDEPENDENT COMPONENT ANALYSIS FEATURE EXTRACTION FOR SUPPORT VECTOR MACHINES

Abstract: The aim of the paper is to propose a new methodology for solving classification tasks based on feature selection using CWT (Complex Wavelet Transforms) and ICA (Independent Component Analysis) projections, combined with SVM (Support Vector Machines).

The resulting supervised classification ensemble system is designed based upon taking projections computed by CWT and estimating independent components from the data set. Each of the classifiers decides the assignment of the test data to certain classes using a different projection of the data. The ensemble classification involves combining the individual decisions of the particular considered classifiers.

The data that is fed to the classifiers is based on real and imaginary, magnitude and phase projections of the characteristics obtained in the feature selection step of the algorithm.

The proposed ensemble system of classifiers based on CWT and ICA supply higher global success rate as compared to the standard classifiers performance. Some of our results confirming this hypothesis are presented and commented in the final section of the paper.

Keywords: Complex Wavelet Transform, Independent Components Analysis, Support Vector Machines, Pattern Recognition.

ACM/AMS Classification: Primary 68T10, 62H30, 68U10; Secondary 68T05