

The use of Grossone in optimization, classification, and feature selection problems

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Abstract

In recent years, a number of papers have demonstrated the ability of the new computational methodology proposed by Y.Sergeyev and based on Grossone in solving nonlinear single and multiobjective optimization as well as global and nonsmooth optimization problems. This new paradigm has also been successfully utilized in Machine Learning algorithms and, specifically, in solving classification problems using sparse Support Vector Machines (SVMs) and new linear and spherical separation methods. Moreover, new formulations for the L_0 pseudo norm that is beneficial in inducing sparsity in the solution can be constructed thus reducing the number of input variables in a predictive model (Feature Selection).

In this talk, the use of new computational methodology will be discussed in the context of novel variations of the classical SVMs methods that utilize pairs of hyperplanes that are not necessarily parallel. Also in this case, the use of Grossone will allow selecting only an important subset of the features.