Feature Set Evaluation and Robust Neural Networks using Boundary Methods

by J.L. Sancho , William E. Pierson , Batu Ulug , Stanley C. Ahalt , A. R. Figueiras-vidal

Abstract:

In this paper we discuss the use of Boundary Methods (BM) for distribution analysis. We view these methods as tools which can be used to extract useful information from sample distributions. We believe that the information thus extracted has utility for a number of applications, but in particular we discuss the use of BM as a new mechanism to Feature Set Evaluation (FSE) and as an aid to constructing robust and efficient Neural Networks (NN) to solve classification problems. In the first case, BM can stablish which feature set is most appropriate for classification. We demonstrate experimentally that the derived ranking is consistent with alternative ranking techniques based on Bayes error (ffl), showing the theoretical relationship between Overlap Sum (OS), the BM measure of class separability, and ffl. Next, we investigate complexity issues associated with using BMs for FSE and compare with other techniques used for FSE. Finally, BM are used as Sample Selecction (SS) mechanism to tra...

Citations

2189 Neural networks – a comprehensive foundation – Haykin - 1994

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