Unbalanced decision trees for multi-class classification

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Abstract

In this paper we propose a new learning architecture that we call Unbalanced Decision Tree (UDT), attempting to improve existing methods based on Directed Acyclic Graph (DAG) [1] and One-versus-All (OVA) [2] approaches to multi-class pattern classification tasks. Several standard techniques, namely One-versus-One (OVO) [3], OVA, and DAG, are compared against UDT by some benchmark datasets from the University of California, Irvine (UCI) repository of machine learning databases [4]. Our experiments indicate that UDT is faster in testing compared to DAG, while maintaining accuracy comparable to those standard algorithms tested. This new learning architecture UDT is general, and could be applied to any classification task in machine learning in which there are natural groupings among the patterns.

Indexed keywords

Engineering controlled terms: Artificial intelligence; Classification (of information); Decision theory; Decision trees; Education; Information science; Information systems; Ketones; Mathematical models; Robot learning; Trees (mathematics)

Engineering uncontrolled terms: International conferences; Learning architectures; Machine-learning

Engineering main heading: Learning systems