A DECISION TREE MODEL OF BUSHFIRE ACTIVITY

David L. Dowe (dld@bruce.cs.monash.edu.au)
Department of Computer Science
and
Noreen Krusel (nkrusel@arts.cc.monash.edu.au)
Department of Geography and Environmental Science

Monash University, Clayton, Vic. 3168, Australia

ABSTRACT

A minimum message length (MML) decision tree inference scheme is applied to the problem of predicting bushfire activity in the mallee vegetation area of north west Victoria, Australia, using over 10 years of data. Bushfire activity is a function of the local vegetation, and models such as the McArthur Forest Fire Danger Index (developed for dry sclerophyll forest) on their own perform inadequately on our Mallee data. The measure of bushfire activity is a single variable conglomerating several poorly recorded variables, such as total area burnt and number of people deployed. MML methods are resistant to learning the noise in such data.

The performance of the currently used Fire Danger Indices in predicting bushfire activity is enhanced by combining them with available meteorological data. The MML decision tree scheme inferred expert systems which performed comparably with linear regression models and also revealed an interesting non-monotonic dependence on the drought index. MML decision tree schemes provide a simple statement of probability for each prediction.