Computer Science > Learning

Alternating Decision trees for early diagnosis of dengue fever

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Dengue fever is a flu-like illness spread by the bite of an infected mosquito which is fast emerging as a major health problem. Timely and cost effective diagnosis using clinical and laboratory features would reduce the mortality rates besides providing better grounds for clinical management and disease surveillance. We wish to develop a robust and effective decision tree based approach for predicting dengue disease. Our analysis is based on the clinical characteristics and laboratory measurements of the diseased individuals. We have developed and trained an alternating decision tree with boosting and compared its performance with C4.5 algorithm for dengue disease diagnosis. Of the 65 patient records a diagnosis establishes that 53 individuals have been confirmed to have dengue fever. An alternating decision tree based algorithm was able to differentiate the dengue fever using the clinical and laboratory data with number of correctly classified instances as 89%, F-measure of 0.86 and receiver operator characteristics (ROC) of 0.826 as compared to C4.5 having correctly classified instances as 78%,h F-measure of 0.738 and ROC of 0.617 respectively. Alternating decision tree based approach with boosting has been able to predict dengue fever with a higher degree of accuracy than C4.5 based decision tree using simple clinical and laboratory features. Further analysis on larger data sets is required to improve the sensitivity and specificity of the alternating decision trees.

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