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The Use of Boosted Multivariate Trees in Medical Decision-Making for Repeated Measurements

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Abstract : Machine learning aims to model the relationship between the response and features. Medical decision-making researchers would like to make decisions about patients' course and treatment, by examining the repeated measurements over time. Boosting approach is now being used in machine learning area for these aims as an influential tool. The aim of this study is to show the usage of multivariate tree boosting in this field. The main reason for utilizing this approach in the field of decision-making is the ease solutions of complex relationships. To show how multivariate tree boosting method can be used to identify important features and feature-time interaction, we used the data, which was collected retrospectively from Ankara University Chest Diseases Department records. Dataset includes repeated PF ratio measurements. The follow-up time is planned for 120 hours. A set of different models is tested. In conclusion, main idea of classification with weighed combination of classifiers is a reliable method which was shown with simulations several times. Furthermore, time varying variables will be taken into consideration within this concept and it could be possible to make accurate decisions about regression and survival problems.

Keywords : boosted multivariate trees, longitudinal data, multivariate regression tree, panel data
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