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Title: Model Trees for Identifying Exceptional Players in the NHL Draft

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Abstract:

We apply model tree learning to the problem of assessing draft prospects in the National Hockey League. A model tree partitions players into groups, easily described to hockey experts, each with its own regression model. The performance predictions of the model tree are accurate and easy to explain.

Outline:

Drafting strong players is crucial for a team’s success. We describe a new data-driven interpretable approach for assessing draft prospects in the National Hockey League. Successful previous approaches have 1) built a *predictive model* based on player features (e.g. Schuckers 2017 [1]), or 2) derived performance predictions from the observed performance of *comparable players* in a cohort (Weissbock 2015 [2]). This paper develops model tree learning, which incorporates strengths of both model-based and cohort-based approaches. A model tree partitions the feature space according to the values of discrete features, or learned thresholds for continuous features. Each leaf node in the tree defines a group of players, easily described to hockey experts, with its own group regression model. Compared to a single model, the model tree forms a collection of models that increases predictive power. Compared to cohort-based approaches, the groups of comparables are discovered from the data, without requiring a similarity metric. The performance predictions of the model tree are competitive with the state-of-the-art methods, which validates our model empirically. We show in case studies that the model tree player ranking can be used to highlight strong and weak points of players.