Statistical Methods for Cricket Team Selection

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Abstract

Cricket generates a large amount of data for both batsmen and bowlers. Methods for using this data to select a cricket team are examined. Utilising the assumption that an individual's natural ability is expressed via performance outputs, this thesis seeks to describe and understand the underlying statistical processes of player performance. Randomness is tested for and then the distributional properties of the data are sought.

This information is then used to monitor the estimate of natural ability via widely accepted control methods, such as Shewhart control charts, CUSUM, EWMA and multivariate versions of these procedures. To accommodate the distribution presented by batting scores, a new control chart based on quartiles is also studied.

Further, ranking and selection procedures employ the estimates of individual ability to select the best individuals and note the probability of correct selection.

Major contributions of this study include:

a) Development of performance measures for cricket
b) 2 – Dimensional runs test, with further applicability outside cricket.
c) Statistical interpretation specific to cricket
    - Outliers are very important
    - Form is autocorrelation
    - Zone rules for cricket needed to detect good/poor performance
    - Relatively short nominal ARL's
d) Control Chart based on quantiles to preserve outlier influences in a non-parametric procedure.
e) The recommendation of appropriate tools for monitoring batting, bowling and all-rounder performance and also choosing man of the match.
f) Discriminates between different types of bowlers using the consistency of their performance measures.
g) Evaluates the members of a team relative to potential contenders.

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