Title: The TPR*-Tree: An Optimized Spatio-Temporal Access Method for Predictive Queries
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Summary
Spatio-temporal databases that manage large volumes of dynamic objects are becoming increasingly important due to numerous emerging applications. This paper introduces the TPR*-tree which improves the TPR-tree by employing new set of insertion and deletion algorithms that aim at minimizing the query cost. The authors introduce the choose path, pick worst and node split methods which are essential to the insertion and deletion approaches. The authors also compare the query performance between TPR-tree and TPR*-tree and improves that TPR*-tree dramatically outperforms TPR-tree.

Detail comments
-S1: The authors derive the first probabilistic model that accurately estimates the number of disk accesses in answering a window query with a spatio-temporal index and analyze the optimal performance of any data-partition index.
-S2: The authors propose the TPR*-tree, which integrates novel insertion and deletion algorithms to enhance performance.
-S3: The authors prove that the TPR*-tree outperforms the TPR-tree.
-W1: The authors compare the performance of TPR*-tree with the locally optimal. However, the locally optimal might be quite different from the global optimal.
-W2: The authors do not justify the feasibility that at each iteration the node with the largest volume is removed and split.
-W3: The authors do not explain that in the NA vs. update num.(LB) experiment, TPR outperformances TPR* when the update number is low.

Discussion
-D1: The optimal TPR tree should aware the sequence of insertion and deletion in advance.