



467th INTERNATIONAL CONFERENCE ON VERY LARGE DATA BASES

3-min Teaser Talk of Paper Accepted in VLDB Journal

Time Series Indexing by Dynamic Covering with Cross-Range Constraints

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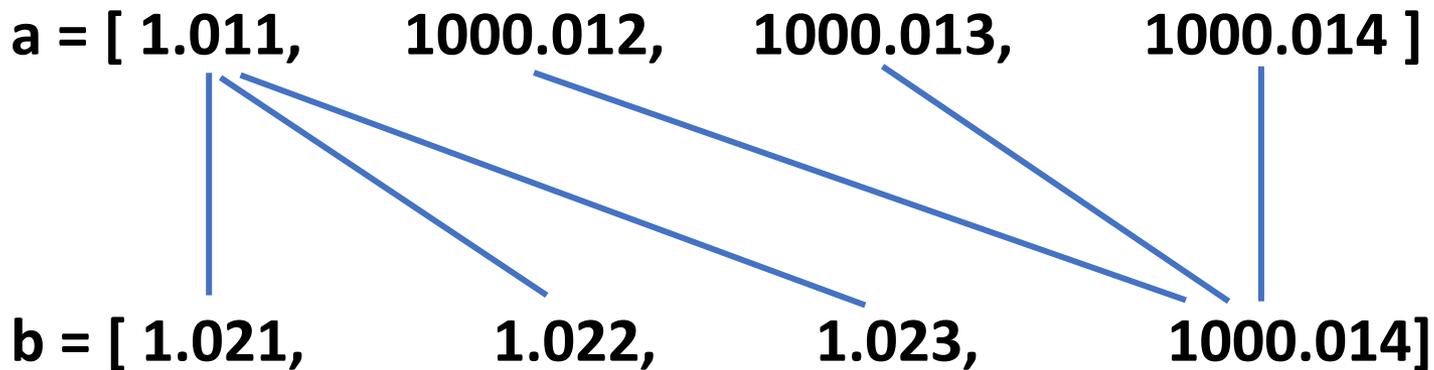
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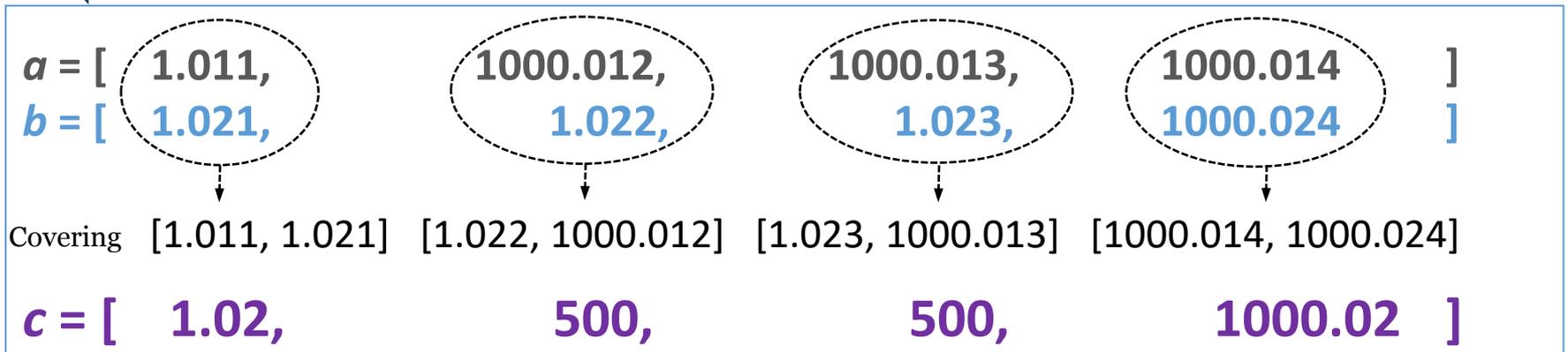
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Dynamic Time Warpping

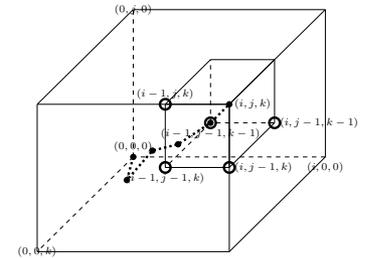
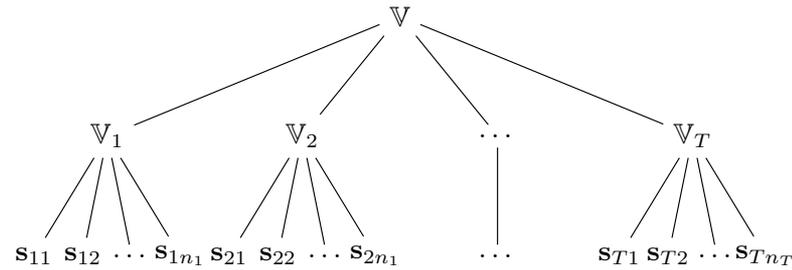
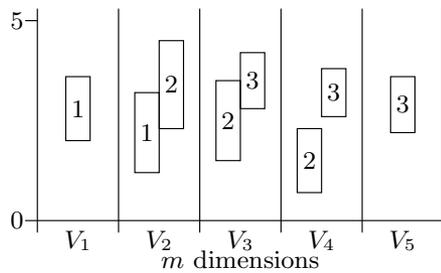


Two time series \mathbf{a} and \mathbf{b} , under DTW distance, but not Euclidian distance, they are similar.

Traditional Covering of Time Series



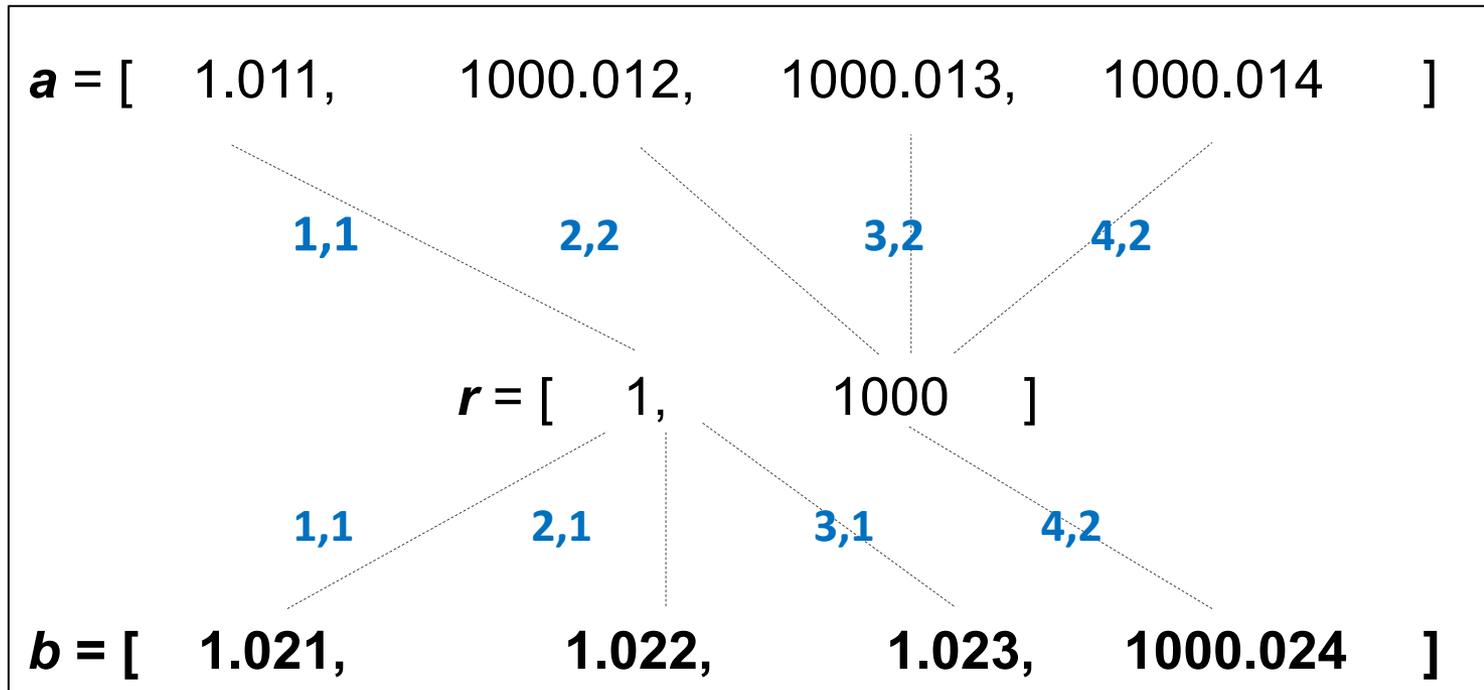
- The hypercube is not an efficient covering structure.
- For example, c is far away from either a or b under DTW distance.



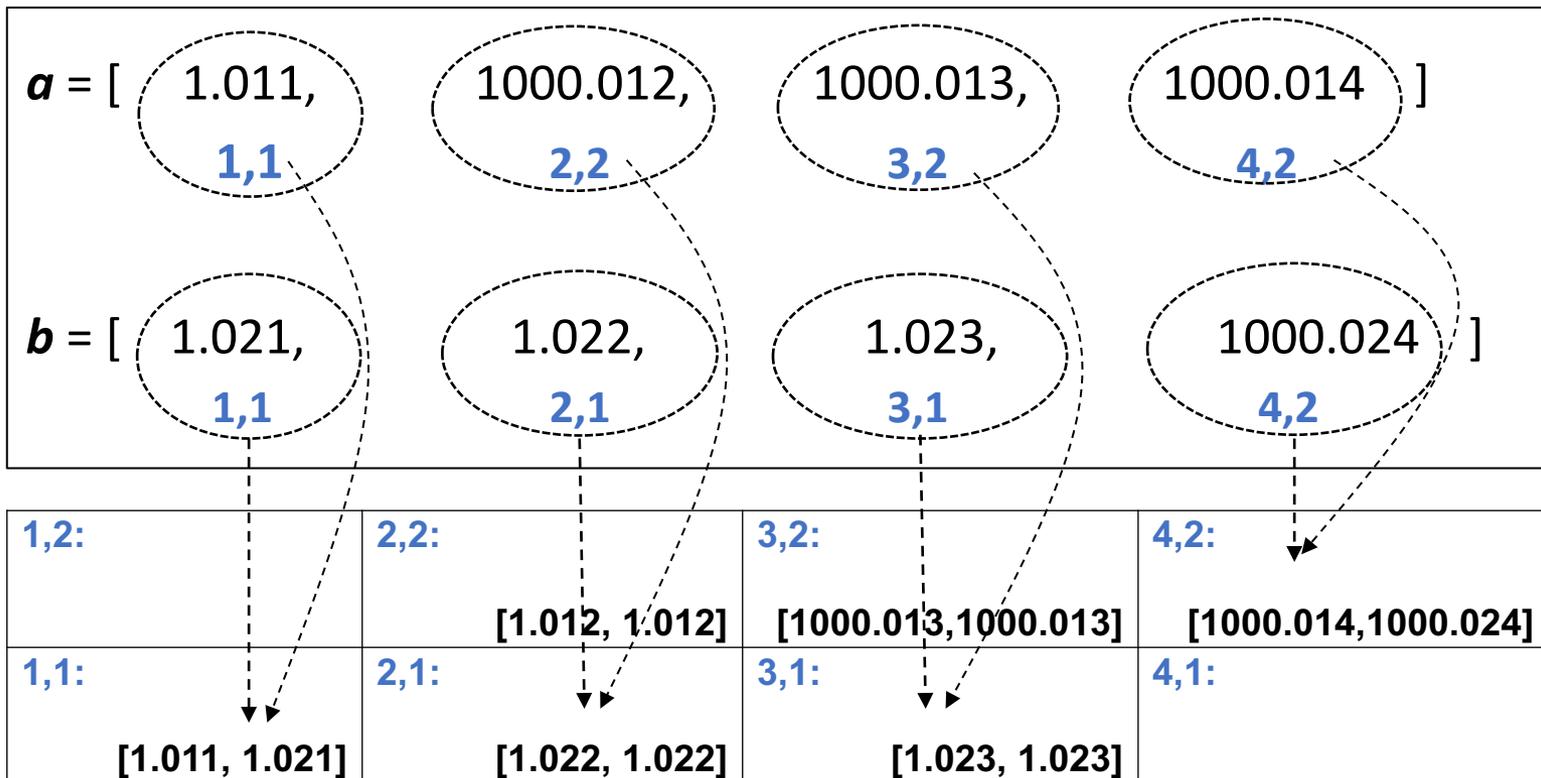
Dynamic Covering with cross-Range Constraints (DCRC)

Reference and Matching

r is a 2-length reference time series, which represents the common shape of a and b



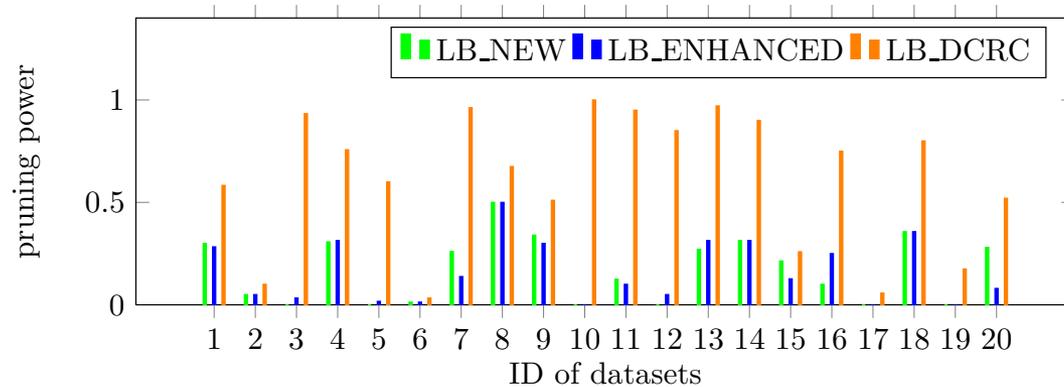
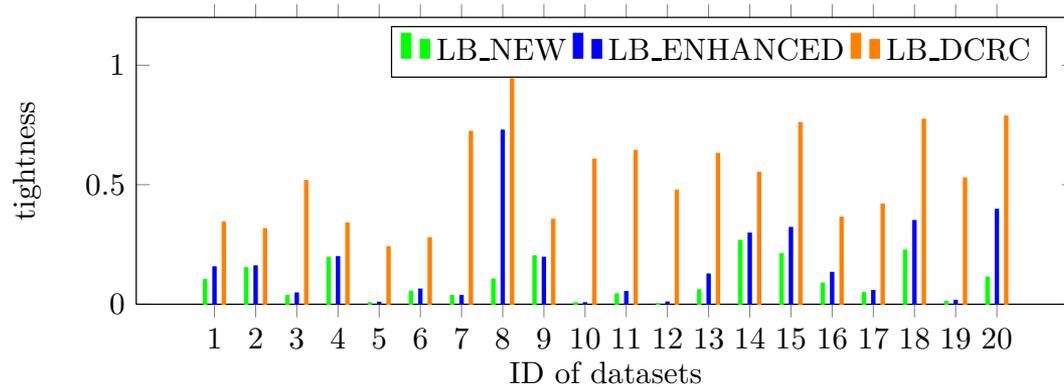
Covering Structure of Time Series



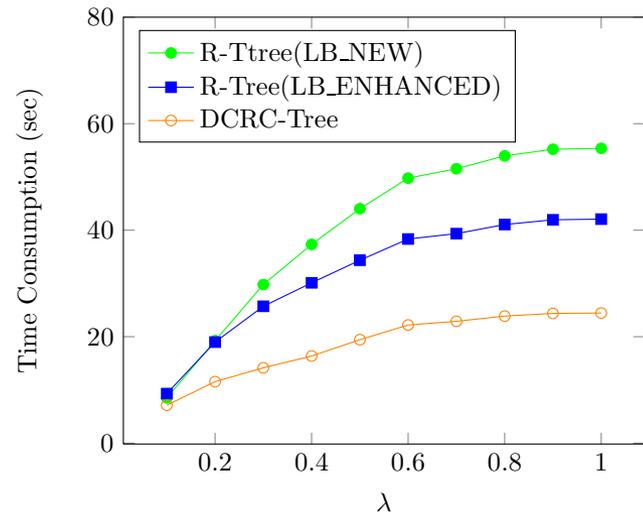
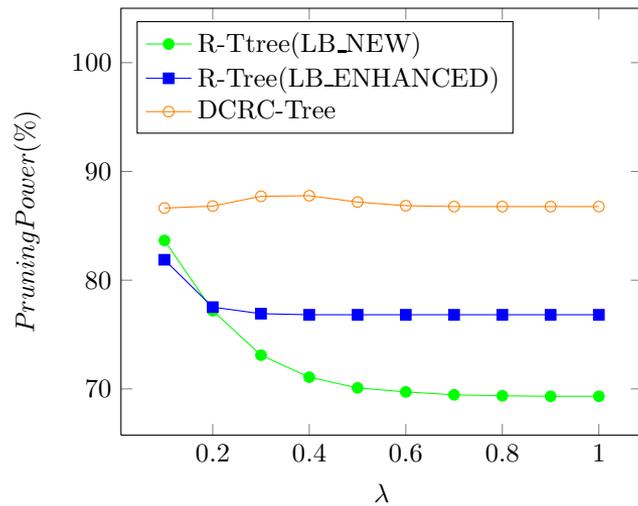
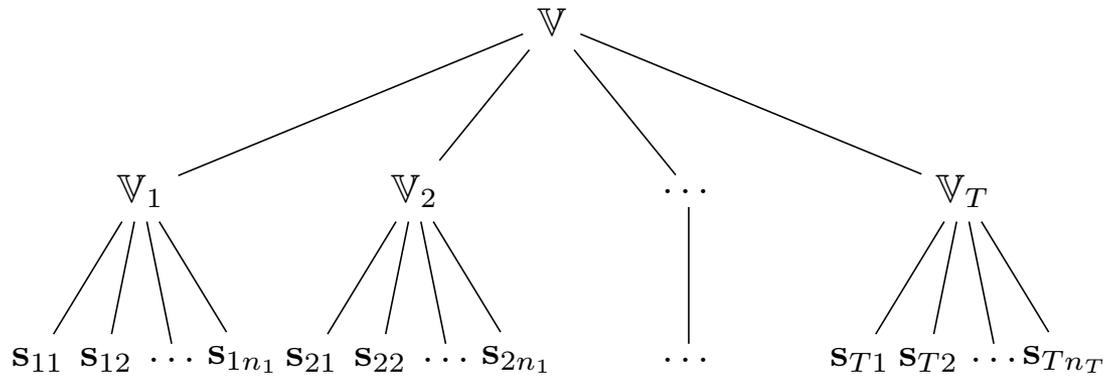
Feasible Paths of DCRC

1,2:	2,2: [1.012, 1.012]	3,2: [1000.013,1000.013]	3,2: [1000.013,1000.013]
1,1: [1.011, 1.021]	2,1: [1.022, 1.022]	3,1: [1.023, 1.023]	4,1:
1,2:	2,2: [1.012, 1.012]	3,2: [1000.013,1000.013]	3,2: [1000.013,1000.013]
1,1: [1.011, 1.021]	2,1: [1.022, 1.022]	3,1: [1.023, 1.023]	4,1:
1,2:	2,2: [1.012, 1.012]	3,2: [1000.013,1000.013]	3,2: [1000.013,1000.013]
1,1: [1.011, 1.021]	2,1: [1.022, 1.022]	3,1: [1.023, 1.023]	4,1:

Lower Bound DTW between Time Series and DCRC



DCRC-Tree



Thank You!

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 <https://bit.ly/DCRC-Tree>