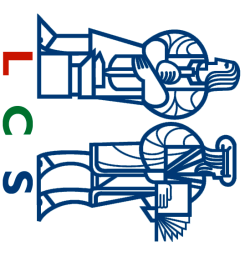


MIT2001-06: Research in Algorithms for Geometric Pattern Matching

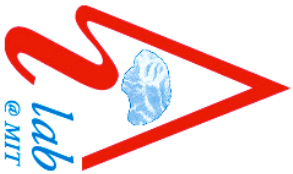
Piotr Indyk



Project overview

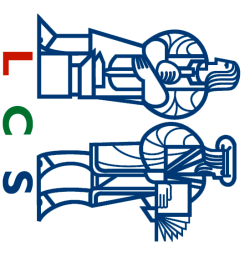


- Geometric pattern matching is a fundamental problem, occurring in
 - Computer Vision
 - Computational Drug Design
 - Computational Biology
- Need efficient algorithms for computing similarity between a pattern and
 - a target object (one-to-one matching)
 - a database of objects (one-to-many matching)



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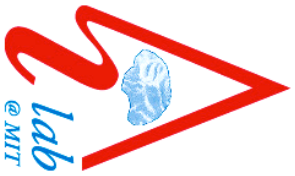
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Progress Through June 2002

Implemented and performed preliminary experimental evaluation of a new method for one-to-many matching of color and texture histograms:

- Implemented the embedding of the Earth Mover Distance into Euclidean space
- Evaluated the error of the embedding, and of similarity search performed on the embedded data
 - Data: Corel-Draw images and their short color signatures (obtained from Y. Rubner from Stanford University)
 - Preliminary results: embedding error less than 10%, which is much less than the theoretical bound indicates

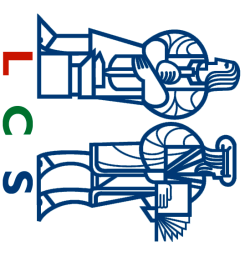


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Research Plan for the Next Six Months



- Perform extensive evaluation of the embedding method, in terms of speed and quality
- Investigate the (very fortunate!) discrepancy between the embedding error in theory and practice
- Integrate the components, create a high-performance system for similarity search in image databases