6.854 Final Project

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Abstract

The abstract text goes here.

1 Introduction

Here is the text of your introduction. We are using [Bokal et al., 2015] and [Chan and Pratt, 2016]

2 Our contribution

We've implemented

- In $O(n)$ time we can find all maximal subsequences that define monotone paths in some (subpath-dependent) direction. [Bokal et al., 2015]
- In $O(n \log^2 n)$ time time we can find all maximal subsequences with diameter at most 1. [Chan and Pratt, 2016]

3 Algorithms

3.1 k^*

Let $k^*(i) = \inf_{m \geq i}\{d(i,m) > 1\}$. **Claim** $j^*(i-1) = \min(j^*(i), k^*(i-1))$. Thus after we calculate $k^*(i)$ for all elements, we can calculate $j^*(i)$ in $O(n)$ time by looping over all indices in the reverse order.

3.2 Bokan et al Overview

Upper triangle method

3.3 Chan, Prat Overview

Range tree method.

4 Implementation Details

Talk about sweep line, etc.

5 Experimental Results

Talk about sweep line, etc.

6 Conclusion

This was a great project!

References

[Bokal et al., 2015] Bokal, D., Cabello, S., and Eppstein, D. (2015). Finding All Maximal Subsequences with Hereditary Properties. In Arge, L. and Pach, J., editors, *31st International Symposium on Computational Geometry (SoCG 2015)*, volume 34 of *Leibniz International Proceedings in Informatics (LIPIcs)*, pages 240–254, Dagstuhl, Germany. Schloss Dagstuhl–Leibniz-Zentrum fuer Informatik.

[Chan and Pratt, 2016] Chan, T. M. and Pratt, S. (2016). Two Approaches to Building Time-Windowed Geometric Data Structures. In Fekete, S. and Lubiw, A., editors, *32nd International Symposium on Computational Geometry (SoCG 2016)*, volume 51 of *Leibniz International Proceedings in Informatics (LIPIcs)*, pages 28:1–28:15, Dagstuhl, Germany. Schloss Dagstuhl–Leibniz-Zentrum fuer Informatik.