COSC470 Research Project Report

Contour Splitting for Branching Structures in CT Image Reconstructions

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October 5, 2021

1 Overview

overview text Example citation [1, 2, 3]. Example URL [1].

2 Introduction

introduction text

3 Background

background text

3.1 Generic Methods

generic methods text

3.2 Correspondence Methods

subsection preamble text

3.2.1 Contour Correspondence

contour correspondence text

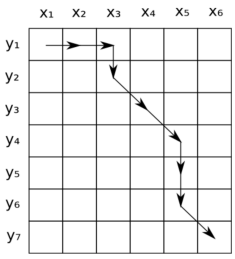
Example list:

[1] https://github.com/cstevenson3/cosc470writing/blob/main/survey.pdf

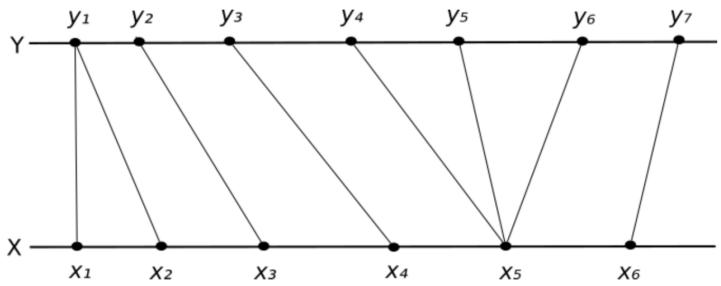
- item1
- item2
- item3

3.2.2 Point Correspondence and Triangulation

pc and t text



(a) DTW path through cost matrix



(b) DTW point correspondence

Figure 1: Two examples of DTW paths on contours X and Y [1]

text after figure declaration

3.2.3 Branching Problem

branching problem text

4 Progress

progress text

4.1 Point Angle Rationale

pa text

Example figure ref (See Figure 2).

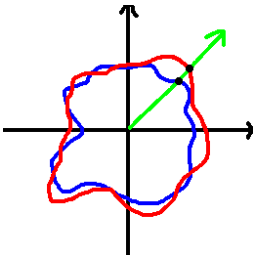


Figure 2: Points matched by angle from shared centroid

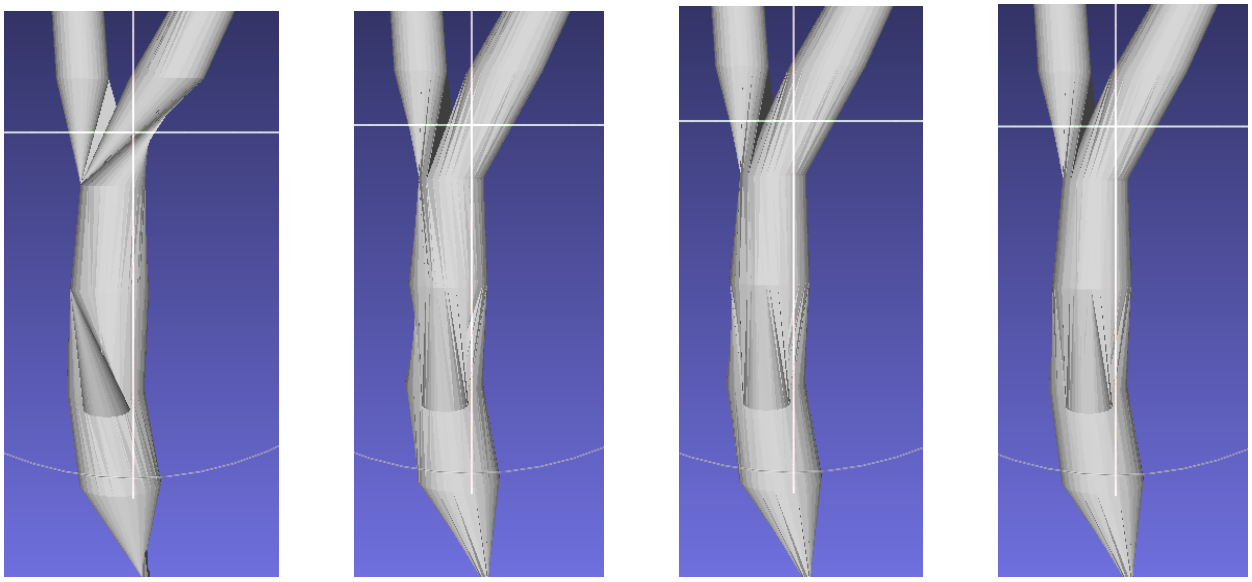
4.2 Point Angle Testing

pa text

Observations:

obv text

Thoughts:



(a) DTW (b) Point angle, 0% angle weight (c) Point angle, 50% angle weight (d) Point angle, 100% angle weight

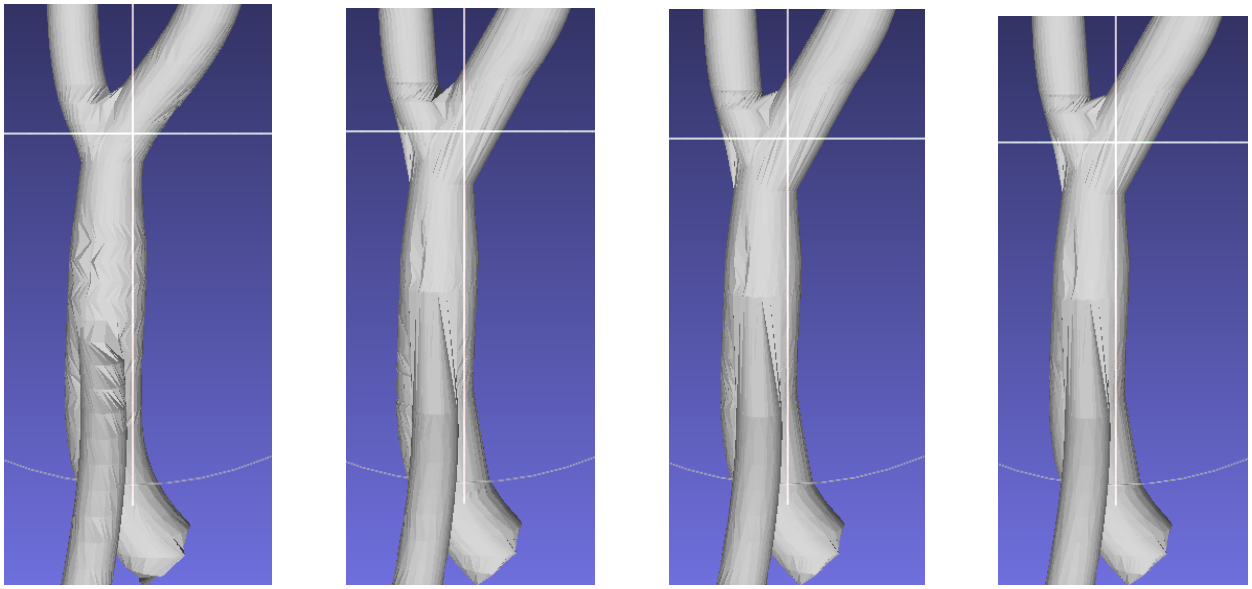
Figure 3: Reconstructions with 10 plane samples

thoughts text

5 Future

5.1 Schedule

schedule text



(a) DTW (b) Point angle, 0% angle weight (c) Point angle, 50% angle weight (d) Point angle, 90% angle weight

Figure 4: Reconstructions with 50 plane samples

References

[1] D. Mackay, "Robust contour based surface reconstruction algorithms for applications in medical imaging," 2019.

[2] R. Mukundan, "Reconstruction of high resolution 3d meshes of lung geometry from hrct contours," in *2016 IEEE International Symposium on Multimedia (ISM)*. IEEE, 2016, pp. 247–252.

[3] Z. Pan, S. Tian, M. Guo, J. Zhang, N. Yu, and Y. Xin, "Comparison of medical image 3d reconstruction rendering methods for robot-assisted surgery," in *2017 2nd International Conference on Advanced Robotics and Mechatronics (ICARM)*. IEEE, 2017, pp. 94–99.

6 Appendix

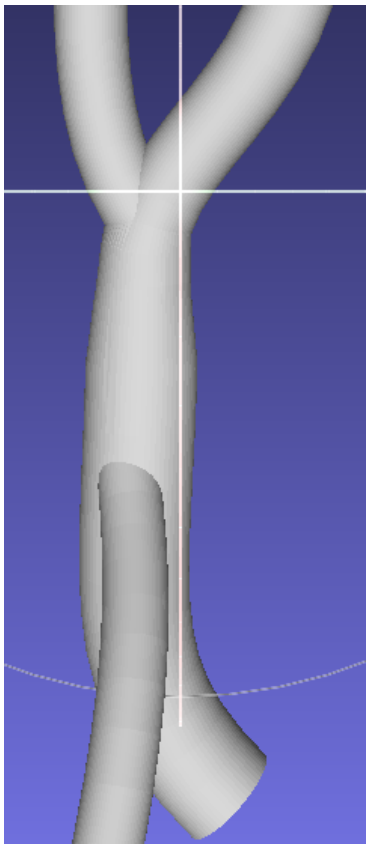


Figure 5: Original multi branch model