

COSC470 Research Project Report

Contour Splitting for Branching Structures in CT Image
Reconstructions

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October 6, 2021

Abstract

abstract text

Contents

1 Overview	1
2 Introduction	1
3 Background	1
3.1 Generic Methods	1
3.2 Correspondence Methods	1
3.2.1 Contour Correspondence	1
3.2.2 Point Correspondence and Triangulation	2
3.2.3 Branching Problem	2
4 Method	2
4.1 Proposal	2
4.1.1 Contour Splitting	2
4.2 Implementation	2
5 Analysis	2
5.1 Ground Truth	3
5.2 Visual Results	3
5.3 Measurements	3
5.4 Summary	3
6 Conclusion	3
7 Appendix	4

1 Overview

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

¹<https://github.com/cstevenson3/cosc470writing/blob/main/survey.pdf>

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

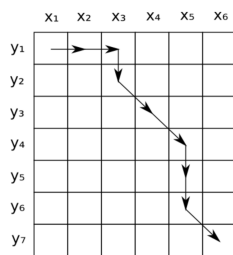
contour correspondence text

Example list:

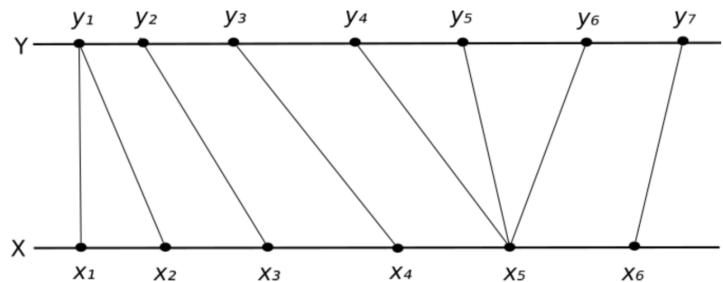
- item1
- item2
- item3

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 Method

method text

4.1 Proposal

proposal text

Example figure ref (See Figure 2).

4.1.1 Contour Splitting

contour splitting text

4.2 Implementation

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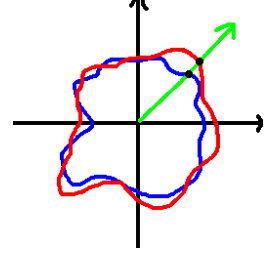
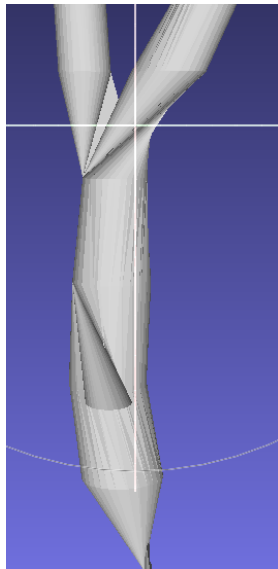


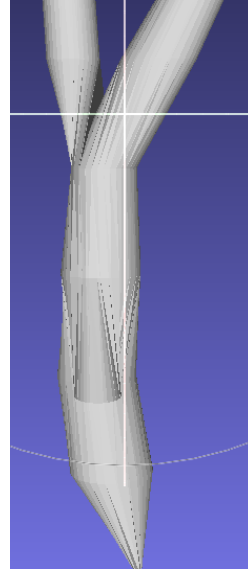
Figure 2: Points matched by angle from shared centroid



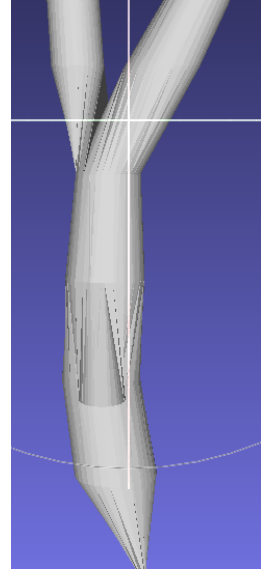
(a) DTW



(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

5 Analysis

analysis text

5.1 Ground Truth

ground truth text

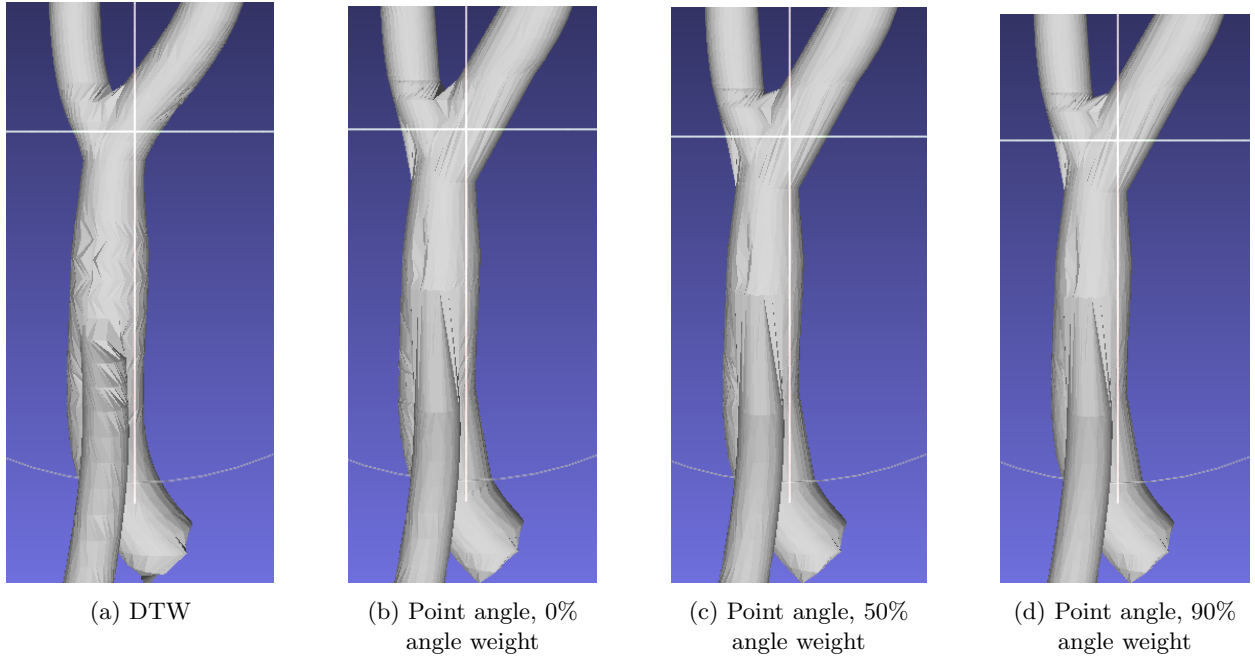


Figure 4: Reconstructions with 50 plane samples

5.2 Visual Results

visual results text

5.3 Measurements

measurements text

5.4 Summary

summary text

6 Conclusion

conclusion text

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.

7 Appendix

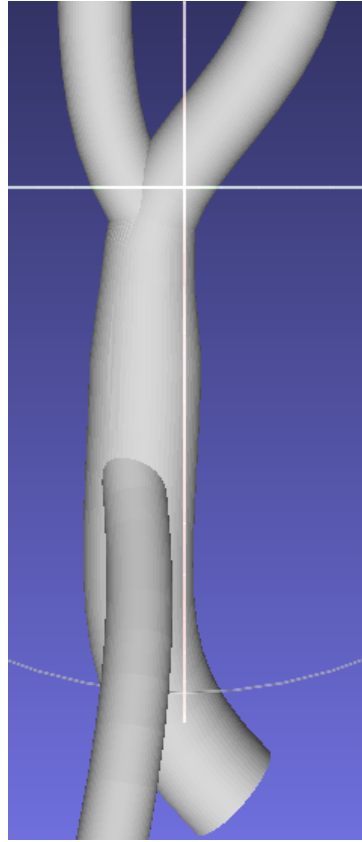


Figure 5: Original multi branch model