Implementation and Visualization of Discrete Stratified Morse Theory on Triangulated Domain

meeting minutes

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Location:	Warnock Engineering Building (WEB) Room 4608
Date:	January 23rd, 2018
Time:	11:00-12:00 am
Instructor:	Prof. Bei Wang Phillips

Project Description

This project is an implementation of Discrete Morse Theory to reduce noncritical data points while keeping the shape of the original data. **The first step** of the project is given a triangulated domain with Discrete Morse Function, producing and visualizing the gradient vector field (namely the noncritical simplex pairs and critical simplices) and perform simplicial removals on the noncritical simplices. **The second step** of the project is given a triangulated domain with any function, producing and visualizing the stratified gradient vector field (namely the violators as well as the noncritical simplex pairs and critical simplices within each stratum) and perform simplicial removals on the noncritical simplices for each stratum.

Agenda items

1. Introduced the basic definition in Discrete Morse Theory, e.g., multidimensional simplex, face and co-face, and simplicial removal.
2. Discussed the properties and geometric realization of Discrete Morse Function and how Discrete Morse Theory can be implemented in topological data analysis.
3. Professor Wang introduced her research of Discrete Stratified Morse Theory which can be used on triangulations with any function value.
4. Decided the phases that can be visualized.

To-do items

Action items	Deadline	Status
Get familiar with Object File Format (OFF)	01/30/2018	In Progress
Implement Discrete Morse Theory from scratch or find open source implementations from Internet	01/30/2018	In Progress
Read the paper on DSMT	02/06/2018	In Progress