

# University of Utah

## School of Computing

CS 6965

Project #3

Spring 2018

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**Due March 15, 2018 at the start of class**

**Project 3** is the 3rd mini project, with a total of 15 possible points (15% of the final grade).

**Project description:**

Learn the basic setup of topological data analysis and visualization using the Topology Tool Kit – TTK (<https://topology-tool-kit.github.io/>).

### Step 0: Getting Started (5 points)

To start, please install TTK following the installation instructions for your operating system:

<https://topology-tool-kit.github.io/installation.html>

In particular, there is a TTK installation video:

<https://topology-tool-kit.github.io/tutorials.html#installation>.

Notice that the video is for an older version of TTK.

Warning: this can take a while, please get started as early as possible. In particular, the installation of paraview alone can take a few hours.

To show your TTK has been installed correctly, please open a terminal and type the corresponding command to load your TTK-patched ParaView.

For Mac (for example):

```
$ cd /ttk/ParaView-v5.4.1/build/bin/paraview.app/Contents/MacOS/
```

```
$ ./paraview
```

Obtaining a screen capture of the TTK startup screen and put it towards your project report (the picture is going to be similar to the image at time 9:44 of the demo video).

### Step 1: Dragon Demo (5 points)

Follow the video to load and play with the Dragon Demo in dealing with scalar field data using contour trees:

<https://topology-tool-kit.github.io/tutorials.html#scalar>

In particular, follow the instructions in the video carefully to simplify the Dragon using persistence simplification.

Obtaining a screen capture of the simplified dragon skeleton and put it towards your project report (the picture is going to be similar to the image at time 13:26 of the demo video).

## Step 2: Morse Persistence Demo (5 points)

Follow the video to load and play with the Morse Persistence Demo in dealing with scalar field data using Morse-Smale Complex (MSC):

<https://topology-tool-kit.github.io/tutorials.html#scalar>

In particular, follow the instructions in the video carefully to segment the MSC features after simplification (e.g. color each 2-cell of the MSC after simplification at the level of 0.7).

Obtaining a screen capture of the segmented MSC and put it towards your project report (the picture is going to be similar to the image at time 6:40 of the demo video).

## Expected Outcome

This project is a simple test over setting up TTK and play with some basic demos involving contour tree and MSC as topological abstraction of data.

The project will be graded based on the 3 screen captures you have obtained during this process.

## Submission

Project 3 is to be submitted via Canvas. Please provide the 3 screen captures (each as a PDF) in a ZIP file.