**CMSC 436 / 636: Data Visualization**

**Assignment 1: Visualization Construction**

**Part 1**

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**Tools Overview**

In this data visualization, I picked dataset1 with two tools: Matlab and Data-Driven Documents(D3). Dataset1 is basically cleaned data with real FA values in text format. And each value is associated with position. For example, the first value is ‘0’, which means in the location (0,0) the FA value is ‘0’. While this dataset is 182\*218 matrices with numbers and spaces. The matrices inspired me to use Matlab and D3 as implement tools to do the Visualization.

Matlab is famous for its matrices generation and computation. Matlab also contains Simulink which is a developing environment that is use in graphic programming for modeling, simulating and analyzing systems. [1] Matlab itself is an IDE and also the name of programming language. The syntax is simple, closer to natural language compare with C, C++ and java. It also contains OpenGL support for graphic rendering. Matlab supports most common numerical data types, like .txt, .data, .csv etc. However, the disadvantage of Matlab is text support and design. Because Matlab is efficient with matrices computing and rendering, the text processing ability is largely confined by its own character. And because Matlab is programming in its own language, when it comes to rendering 3D image, it is hard to make changes to some design. For example, when programming to render color legend, programmer can only have choice to make it vertical or horizontal in certain locations, instead of placing it anywhere in any direction.

Data-Driven Document is a library of JavaScript, which is focusing on data visualization. D3 also helps programmer to realize data without using HTML, SVG or CSS. And D3 emphasis on web standards and good supportability for popular browsers. [2] Its programming language is JavaScript but with additional gramma, so called chain select, which is highly proficient way of programming. D3 supports most data types, like .json, .txt, .csv etc. While on the other hand D3 got its limitation too. Since it works for web browser, the txt with numbers are all stored as strings, which could be a little annoying to process. And D3 is functional on 2-D rendering but no capability on 3-D rendering. If one really wants to represent the data in 3-D, D3 could work with other JavaScript library to make it into 3D, which is an example shown in this link <http://www.billdwhite.com/wordpress/2015/01/12/d3-in-3d-combining-d3-js-and-three-js/>

References:

[1] https://en.wikipedia.org/wiki/Simulink

[2] https://d3js.org/