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CMSI 402

**Verbal Description**

GRNsight is a web application and service for visualizing gene regulatory networks. It allows for the uploading of data matrixes outputted by GRNmap, a related software that simulates how genes change over time. Similar programs such as Cytoscape and Gephi work with very large networks and can be difficult to learn. GRNsight specifically works with gene regulatory networks that have a relatively small number of nodes and edges. They also both require a download and install. GRNsight is web-based, requiring only a web browser. The end user currently is a systems biologist working with gene regulatory networks. However, GRNsights functionality can be extended to work with any data that can be visualized as a matrix. A small team of developers at Loyola Marymount University performs maintenance and updates to the application.

**Justification**

The GRNsight project is appropriate for the class for several reasons. The proposed features use information learned in data structures and algorithms, as well as interaction design to improve the user experience. As my familiarity with Javascript has grown, I see a variety of improvements, optimizations, and code cleanup that can be done to make the code easier to read and faster to execute. The improvements and features are difficult, particularly the segments relating to graph optimization and redesign. However, I feel my exploration of D3 and graph theory make these features possible within a semester. I will also be working alongside Dr. Dahquist and Dr. Dionisio, who are there to provide additional information and help should it be needed.

I’ve been working on the GRNsight project for almost 4 years at this point, and it has become a project I love to work on. A semester-long class will allow me the time to truly dedicate to the project and improve it in ways I’ve wanted to for a while, but simply haven’t had the time to. I began the project when I was very new to programming, as I feel as though in many ways, the project has grown as I have. I am excited now to give it the attention it deserves and improve the quality issues that remain from when I was a new programmer who had never written a line of Javascript, as well as adding on new features that will make the project something that could gain traction as a useful tool in the world of systems biology.