

Alexia Filler

CMSI 402

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Project Proposal

Description

For my CMSI 402 project, I will be designing, creating, and implementing a database to be used within the GRNsight project run by Dr. Dahlquist of LMU Biology and Dr. Dionisio of LMU Computer Science. This database will contain gene expression data, metadata, degradation rates, and production rates, which will altogether allow the user to visualize a gene regulatory network with node coloring that results from preexisting data from our database instead of requiring that the user upload their own expression data. Implementing this feature entails the use of AWS RDS. In addition, my feature will include a user interface so that users can use the site easily to choose the data they wish to visualise from the existing database. Along with this, there will be functionality that will support the exporting of the data to an Excel workbook in a GRNmap-compatible format. These latter sub-features will primarily require the use of Node JS. Altogether, this feature will make previously collected GRNsight data more accessible and usable for the target audience, which is any group of students, professors, or researchers who might benefit from the visualization of gene regulatory networks.

Justification

This project applies skills that I have learned throughout my career at LMU, including those I gained in Intro to Computer Science, Interaction Design, Databases, and CMSI 401. It extends what I have done in other classes and research projects at LMU in that it is a fundamentally interdisciplinary project originating in Biology research. It will be technically difficult because it is a whole new feature to be added to an existing service. It will require database design, front end implementation, and connection to a web service, but these tasks, while challenging, should all be doable because I have learned the fundamentals of these skills throughout my education at this university (especially in the previously mentioned classes). If I stick to my outlined schedule and hold myself to my deliverable goals, this project should be doable within the time frame of this semester. Due to the combination of my in-class experience with my work on Amplify, my previous work on GRNsight, and the guidance I have from Dr. Dionisio, I possess the knowledge and tools to pursue this project. Working on the GRNsight team for the past year means that this project is of great interest to me because I have grown familiar with the work process, the tools, and the layout of the code that has been built up over years of other students working on the team. I believe that the interdisciplinary nature of this project will make it unique

and interesting to my classmates as well as my instructor, for it shows how the subject of computer science is both applicable and necessary within many other fields.

In conclusion, my experience as an undergraduate student in Computer Science provides me with the tools and knowledge necessary to work on and complete this interdisciplinary project under the advising of Dr. Dionisio.