

EE / CprE / SE 491 – sdmay21-12

Biochemistry Virtual Lab

Report 5

3/11/2021 – 3/25/2021

Client: Professor Stone

Faculty Advisor: Professor Mitra

Team Members:

Steven Dirth
Brody Sunsten
Peter Bancks
Jacob Christopherson
Romain Obame
Enzo Ciccarelli-Asta

Past Period Accomplishments

- Validation input table – Romain
 - Enhanced validation table: When user get to step 2 of the lab, user will need to enter the elution volume before filling out the log and vevo column. That’s because the elution volume is used later on to calculate the vevo value of each sample. Each input entered by the user can now be validated by highlighting the cell. If the input data of a given cell is correct, the cell will be highlighted in green and red otherwise.
- Started implementing pieces used for protein separation animation. The animation of the cylinders of color (to represent the different proteins) has not yet been implemented, but the eight models and the separation tube have been staged to allow work to start.

Pending Issues

- Camera movement is slow and jittery – need to refactor movement system to be “smoother”
 - We received feedback that the camera controls feel sluggish, which will be fixed by modifying the movement rate from the standard 1 unit left or right to a higher number, which should make the camera feel as though it is reacting faster. A better number has not yet been defined, but should be easy to determine through a bit of testing.
- Alternate click and drag camera controls requested, needs to implement slider to switch between new system and current system. - Pete
 - Our current system utilizes the WASD keys for movement in the XZ plane, as well as QE to move up and down in the Y plane. An alternative was suggested, where controlling the camera by holding the mouse and dragging to move around a fixed point, which should enable ease of use on a trackpad setup.

Individual Contributions

Team Member	Contribution	Period Hours	Total Hours
Steven Dirth	Started work on click handlers for threejs	5	25

Brody Sunsten	Worked on smooth camera and adding in more models.	4	17
Peter Bancks	Fixing camera issues + initializing protein separation animation	5	20
Jacob Christopherson	More animation	3	17
Romain Obame	Handled table to support LOG function and division operator & currently working on table autofill	6	24
Enzo Ciccarelli-Asta	FILL IN INFO		11

Table Update:

For the past two weeks we had implemented the table below to support LOG function as input. After **=log(some Cell name)** is entered, the cell will be highlighted in green to show the correctness of the input; and red if the input is wrong. This is only specific to the Log column of the table.

For the ve/vo column, the table now support division operator. The user now can enter **=some cell name/some cell name** to calculate ve/vo value. The cell will be highlighted in green to show the correctness of the input; and red if the input is wrong.

Plans for Coming Week

- Notebook new Feature- Romain
 - Finish up table auto fill feature: When the student enter at least one correct data entry, the current table column should be able to automatically fill with the correct data
 - Create a Gel Filtration Standard Curve: Need to make a filtration curve after all data from table have been entered. The curve should be a line showing the relation between vevo and log(molecular weight) value of each sample.
- Smooth out the camera controls - Pete
 - As stated in the Pending Issues section, movement controls will be modified to cover more distance in less time. This should fix the issues of sluggish controls.
- Animate protein separation tube - Pete
 - Animating the protein separation tube requires a great deal of manipulating objects. The eight cylinders to be used for the proteins themselves are currently grey, and will need to be changed programatically to match the colors of the proteins selected in the notebook.
 - The models also need to be translated through the separation tube model to simulate the separation process. Each protein will need to be translated at a different speed to match the concepts seen in the physical lab.
- Click handler for threejs objects
- Implement drag controls for camera - Pete
 - As stated in the Pending Issues section, new controls will be implemented to allow better use on a laptop with a trackpad instead of a mouse. These controls will involve dragging the camera around a fixed point.

