

Progress Report

Liusu Wang
Kuangyou Yao
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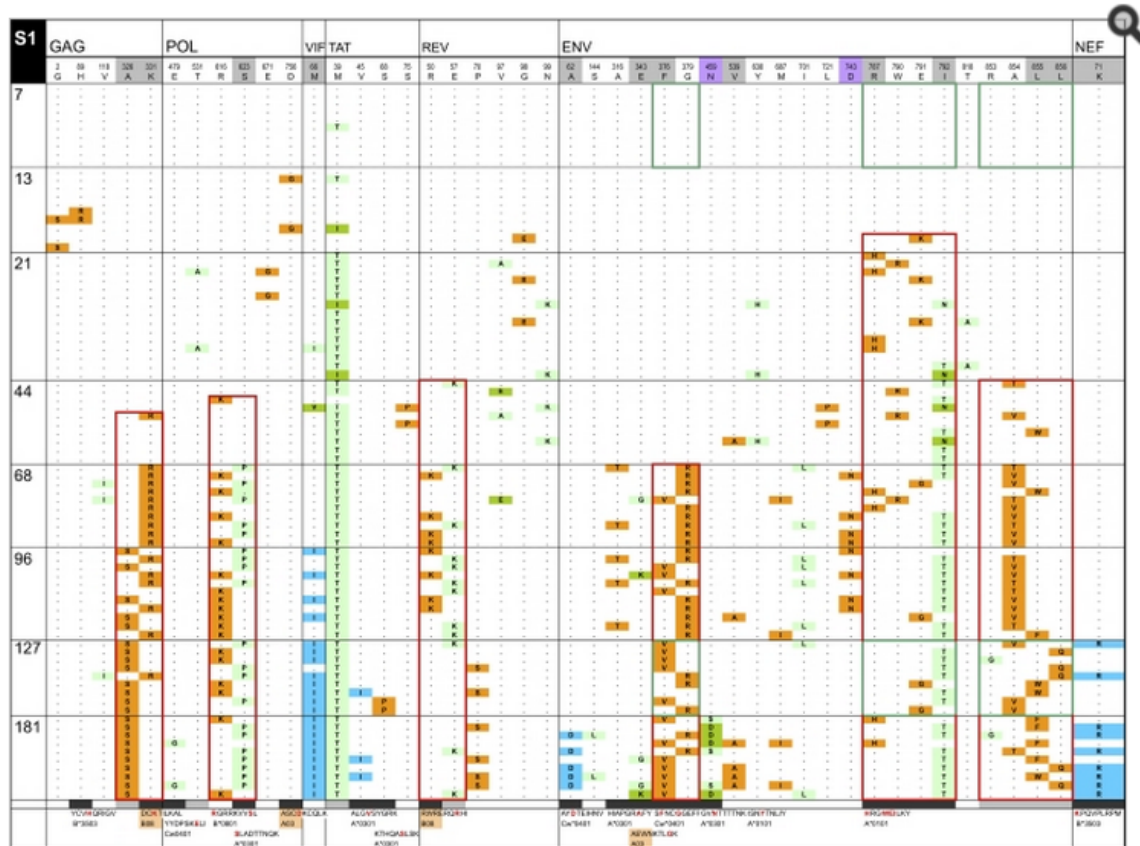
Visualizing HIV Mutation

AIDS is caused by HIV, which is a highly mutable virus. Once HIV enters a subject's system. The HIV virus will "evolve" to different types in order to escape from subject's immune system. The virus evolves through a change in certain amino acid in its protein shell. According to Andrew, the scientist at Fred Hutchinson center, research shows that most people infected with HIV have T-cells that target specific region of the virus, known as epitopes, which are ineffective at recognizing the virus over time. Specifically, they target a part that is prone to mutation; however, a small minority of people known as "elite controllers" have T-cells that target a very unique set of epitopes and are able to control without ever developing AIDS.

Our project is aim to design and build a tool to help spot interesting region of the HIV's protein sequence, which is less likely to mutate over time, and provide an interactive view of the virus mutations.

While there are some existing visualizations, none of them completely fulfills this task do not allow easy manipulation of the graphic and exploration of the data at the level we hope to accomplish. We also aim to make the tool extensible, and the final software polished enough to be used by researchers in the field and for use in publications in further HIV mutation studies.

Fig. 5.



Place to improve:

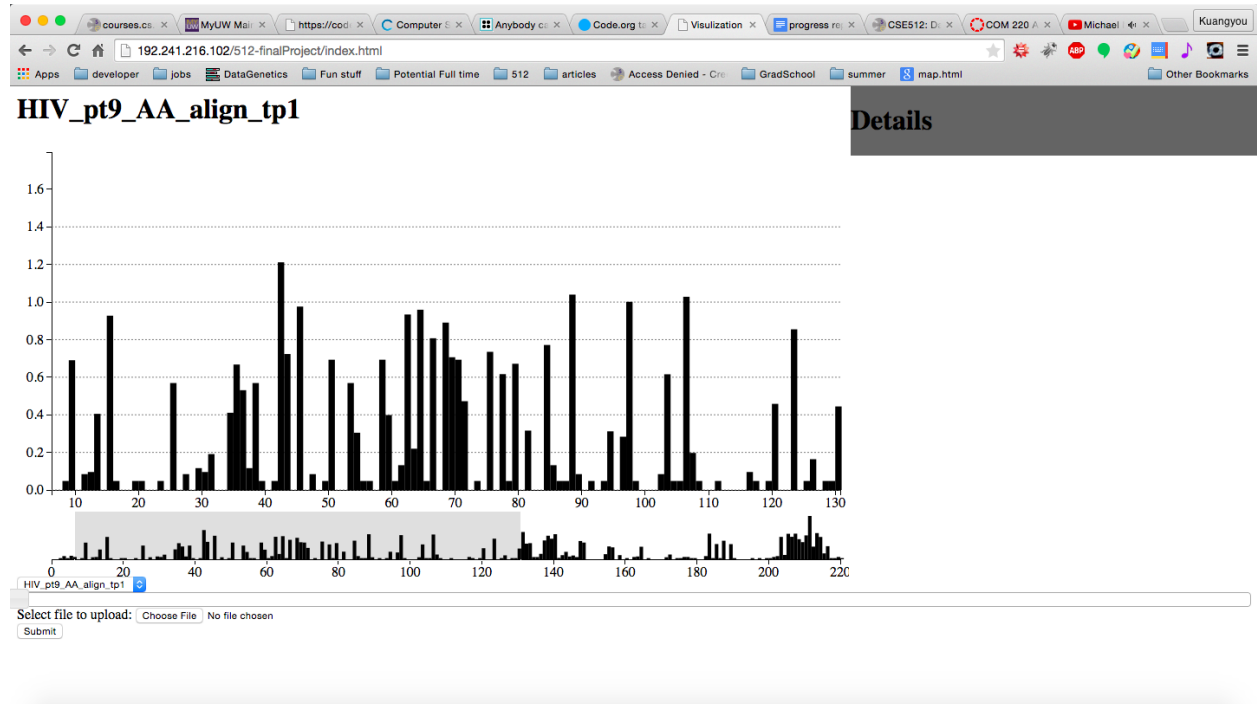
1. Visualization is hard coded using Microsoft Excel. it is static.
2. It can only show the column of amino acid with significant mutation, excluding the ones with little mutation.
3. Lack the capability to interact with external data source.

Our Current Visualization in Progress

Access to the current visualization:

<http://192.241.216.102/512-finalProject/index.html>

Peek to the current visualization:



Implemented Features:

1. Black and white Focus + Context visualization of a whole picture of the Protein sequence.
2. Able to upload a raw .fasta file and visualize the entropy bar chart.

To be implemented features:

1. interactivity with the current existing table
2. Interface with external data from different database.
3. Color coding scheme. Highlighting numeric values and mutation.

Project Plan

A list of milestones breaking the project into smaller chunks and a description of what each person in the group will work on.

Time	Milestone
5/12	Project Proposal
5/13	Problem Space Findings and Sketches of Initial Design
5/15	Backend Data Cleanup
5/17	Literature Review and Competitive Analysis
5/18	Final Design and Storyboard
5/19	Entropy Barchart and Brush Implementation and Test
5/20	Slides and Progress Report
5/21	Presentation of Ideas
5/22	Details of Interaction Implementation and Test
5/25	Layout of Page
5/27	Meet with Andrew and Mike for Further Requirements
5/29	Starting Project Paper
5/30	Starting Poster
6/01	Refining Details in Design and Implementation
6/02	Critique on Visualization Software
6/04	Poster and Critique
6/05	Refining Details in Design and Implementation
6/06	Poster Printing
6/07	Finalize Visualization Software and Poster

6/08	Poster Presentation
6/09	Meet with Andrew and Mike for Paper Review
6/10	Refining Project Paper
6/11	Finalize Project Paper

Tasks

Kuangyou Yao: Backend Implementation, Entropy Chart, Paper
 Liusu Wang: Details Chart, Design, Paper

Reference

Herbeck, J., Rolland, M., Liu, Y., & McLaughlin, S. (2011, August 1). Informative Sites. Retrieved May 20, 2015, from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3147913/>

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