Data Visualization and Representation of a Quantitative Patient State in Radiation Oncology

Project Proposal

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Summary

This project will improve upon some features of OncoBrowser, specifically longitudinal patient outcome charts and star charts to visualize the patient condition. The ultimate goal of this project is to make these features easier for clinicians to use and view/add data.

Background and Significance

OncoBrowser is a tool for clinicians to view patient data, history, and treatment plans, and improving on features within OncoBrowser will allow clinicians to access and view patient data in a more organized fashion.

Goals

- To make longitudinal patient outcome charts that allows clinicians to easily see patient data over various visits
- To improve clarity of star charts that represent patient data
- To make data entry easier (interactive graphs)

Technical Approach

All front end components will be written in C#, and SQL will be used to access the Mosaiq database. Additionally, some charting tools such as Chart.js (simple and flexible JavaScript charting for designers & developers) may be used to make graphs more interactive. Embedding Javascript within the current code can add some new functionality to the modules. For example, plotly.js (Javascript graphing library) offers some interactive graphs that allow one to add and delete points on a plot. Another potential Javascript library for manipulating data based on documents is D3.js, which is extremely fast and able to support large data sets and dynamic behaviors for interaction and animation. These three libraries (Chart.js, plotly.js, and D3.js) all offer additionally functionality that can be useful to improving OncoBrowser features.

Deliverables

Minimum

- Longitudinal patient outcome chart

Expected

- Star chart module improvements
- Proper documentation of code

Maximum

- Making patient outcome charts and star chart module more interactive (i.e. click on graph to plot point)

Management Plan

This project will be completed under the supervision of Michael Bowers and Dr. Todd McNutt. Weekly status updates will be provided to all mentors.

Dependencies

Status	Dependency	Description
Completed	HIPAA Certification	Learning modules that ensure HIPAA compliance (HIPAA for Research, Basic Human Subjects Research, Electronic Information Security and Data Management Treatment, Patient Privacy for Workforce Members)
Pending	Access to OncoBrowser database	Database of patient data, clinical assessments, and treatment plans
Pending	Access to OncoBrowser codebase	Source code repository for OncoBrowser website

Milestones

Date	Milestone
10/26/17	Completed project proposal
11/02/17	Learn SQL and Mosaiq database schema Select data visualization tools and packages to be used.
11/14/17	Finish longitudinal patient outcome chart
12/05/17	Finish star chart module improvements
12/15/17	Finish final report

References:

Plotly.js library: https://plot.ly/javascript/getting-started/

Chart.js tools: http://www.chartjs.org/

D3.js library: https://d3js.org/