Filter Design

VIP-ITS Project Proposal

Group Members

David Saiontz

- Second year CS student
- Java, C#, Ubuntu

Chawalit Saetiew

- Third year CS student
- Java, C, C++, Python, ML,

Nick Bennett

- Third year CS student
- Java, C, Python, SQL

OVERVIEW

One issue we would like to solve is, currently, online labs cannot interface with the ITS database, and thus ITS cannot collect data pertaining to the online labs. This data could include how a student solves a particular problem, what tools or resources they use to solve a problem, and how long it takes them to solve a problem. We will solve this by converting the GUI, which is currently powered by MATLAB, into a web-based GUI. By doing this, we will be able to have the GUI communicate directly with the ITS database, allowing ITS to obtain more information. This will be used to make ITS better at determining how students can best learn and absorb new material.

To create the web page, we will use a combination of HTML, JavaScript, and React. This will allow the GUI to interface directly with the existing ITS database. We will also use GitHub to allow for remote file sharing and management. Finally, we will use GroupMe to coordinate with one another and schedule meetings.

GOALS

1. Convert the filter MATLAB GUI into a web-based GUI that is intuitive to use with clear presentation of formulas and information
2. Connect to the ITS database to populate GUI and transfer data

POTENTIAL PITFALLS

1. Being able to successfully translate the MATLAB code
2. Creating a system that allows graphs and objects to exchange information
3. Not creating smaller, more manageable goals for each week

MILESTONES

Week 6	Chawalit: Research Filters and how they work in MATLAB David: Reverse engineer Filter Design demo Nick: Research previous work done on Filter Design Demo
Week 7	Chawalit: Get experience with HTML and JavaScript in relation to React David: Finish reverse engineering Filter Design demo and get experience with JSXGraph and JavaScript Nick: Research React, JS, and JSXGraph
Week 8	Chawalit: Design the framework of the GUI and continue learning React David: Get experience with JavaScript and find graphs that can be used for Filter Design in JSXGraph Nick: Continue research and create initial template with React
Week 9	Chawalit: Code the skeleton of the UI(buttons and text) David: Begin creating functions necessary to show correct graphs on webpage Nick: Work on UI elements
Week 10	Chawalit: Implement other UI functions David: Continue creating functions necessary to show correct graphs on webpage Nick: Continue with UI and other front-end code
Week 11	Chawalit: use JSXGraph to implement filter graph functions David: Research SQL and SQL servers Nick: Research ITS backend
Week 12	Chawalit: Handle Events and inputs and display them on graphs David: Create API for GUI that can interface with ITS SQL server Nick: Start working on DB queries
Week 13	Chawalit: Connect database with GUI David: Continue working with API for GUI that will interface with ITS SQL server Nick: Finish DB and start finalizing GUI
Week 14	Chawalit: finish up GUI and document work for further expansion

	David: Finish up and document API for GUI and work on SQL server Nick: Finalize and document DB and GUI
Week 15	Chawalit: finish up GUI and work on presentation David: Document any clean up any remaining work that has been done Nick: Clean up remaining work and work on presentation
Week 16	David: Clean up both GUI and API and finish presentation Chawalit: Error check and finish presentation Nick: Finish presentation and debug

TOOLS AND RESOURCES

1. ITS Class Website: http://its.vip.gatech.edu/VIP/
2. ITS GitHub: https://github.gatech.edu/VIP-ITS
3. ITS Documentation: http://its.vip.gatech.edu/docs
4. ITS JSXGraph Demos: http://its.vip.gatech.edu/VIP/demos
5. Filter Design in 30 Seconds:

   http://www.vyssotski.ch/BasicsOfInstrumentation/FilterDesignIn30Seconds.pdf