ITS Project Proposal
Continuous Convolution JavaScript GUI

Group Members:

Name	Major	Skill Set	Project Responsibilities
Reema Patel	4th year Computer Science	Python, Java, JavaScript, C, GitHub	UI and logic for 3 signal types
Adam Chau	2nd year Computer Science	Python, Java, HTML, SQL	UI and logic of front page
Jessica Bishop	2nd year Computer Science	Python, Java, HTML, CSS	UI and logic for 3 signal types

Project Goals:
- Convert Continuous Convolution MatLab GUI into web-based JavaScript GUI that can be supported on a website for later lab integration.
- Each group member will become sufficient in developing with JavaScript, managing code using Github, and reading Matlab.
- Each group member will be able to use the skills learned from their respective task assignments (i.e. JSXGraph.)

Schedule:

Week	Task
5	**Everyone:** Setup Github repository for project. Install all necessary tools to work with the repo. Review Matlab code for Continuous Convolution demo and understand the logic (i.e. how backend works, what the components of the GUI are). Learn about JavaScript.
6	**Everyone:** Continue to work on understanding Matlab GUI and mathematics behind how it works. Continue learning JavaScript. Look into JSX Graph components that could replicate the behaviors.

7	**Everyone:** Research possible JavaScript frameworks to use for the project (i.e. React, Angular) and discuss together on best choice for project. Continue learning JavaScript.
8	**Everyone:** Work on understanding chosen framework by building an example project. Setup general files (if possible) needed for a project in chosen framework.
9	**Overall:** Start work on JavaScript GUI **Reema:** Better understand how JSXGraph library works. Attempt to recreate functionality of some of the graphs of the Matlab GUI. **Adam:** Setup basic window for GUI to run on. Design how front page will look and place necessary JavaScript components. **Jessica:** Work on getting new windows to open when 'Get x(t)' and 'Get h(t)' buttons are clicked.
10	**Overall:** Work on GUI **Reema:** Work on 'Get x(t) page'. Work on one signal type and add in extra components like parameters and graph. **Adam:** Continue working on main page. Use temporary data to work on displaying graphs. **Jessica:** Work on 'Get h(t) page'. Work on one signal type and add in extra components like parameters and graph.
11	**Overall:** Work on GUI **Reema:** Work on a different signal type for x(t). **Adam:** Continue working on main page. Focus mainly on displaying graphs. **Jessica:** Work on a different signal type for h(t).
12	**Overall:** Work on GUI. Should finish all signal input types this week. **Reema:** Work on a different signal type for x(t). **Adam:** Continue working on main page. Focus mainly on displaying equations. **Jessica:** Work on a different signal types for h(t).
13	**Overall:** Work on GUI **Reema:** Work on option bar on top of main page **Adam:** Work on getting data from x(t) and h(t) and using it for graphs and equations. **Jessica:** Work on flip x(t) and flip h(t) option.
14	**Overall:** Work on GUI **Reema:** Work on 'Tutorial Mode' option. **Adam:** Work on linking on all of the extra pages/options to main page. Make sure GUI is working and easy-to-use. Fix any bugs that arise. **Jessica:** Work on 'Set t value' option.

15	**Everyone:** Do final evaluation on GUI and see if there are any small improvements to be made. Make sure code is well documented and README/Wiki is updated. Start working on final presentation.
16	**Everyone:** Work on final presentation and present the presentation.

Project Description

Problem
When students in ECE 2026 work on labs, they must use the Matlab GUIs that are provided. This is an inconvenience because Matlab must be installed on the student's computer. Another inconvenience is that because the labs questions are web-based, students must have both a webpage and the Matlab GUI up.

Solution
Our goal is to convert one of the Matlab GUIs, Continuous Convolution, into a JavaScript GUI. This will allow students to use the GUI without needing Matlab installed on their computer. Later on, this GUI can also be integrated with the lab because it will be web-compatible.

Potential Challenges
   ● Since none of us have experience with signal processing or Matlab, we will need to take some time to understand how the current Matlab GUI works.
   ● Since we are not extremely proficient in JavaScript, we will need to take time to learn JavaScript before beginning the project.
   ● Since we are working on one GUI that only has a few pages, we might encounter code conflicts that we will have to resolve.
   ● The Continuous Convolution Matlab GUI has many components, so we might not be able to implement every feature due to a lack of time.

Tools and Resources
   ● Github for code management: https://github.gatech.edu/VIP-ITS
   ● Matlab code for Continuous Convolution
   ● JSXGraph library
   ● Piazza page: https://piazza.com/class/jkvj87svjtv8
   ● ITS Documentation: http://its.vip.gatech.edu/docs/
   ● GroupMe for team communication

Final Deliverables

The goal for the final presentation is to be able to have a fully converted JavaScript GUI for Continuous Convolution with all the signal types implemented, all of the graph/equation logic implemented, and extra features such as the flip x(t) and h(t). We are not planning on setting up the backend database with the GUI, simply doing all of the logic in JavaScript. However, we do plan on heavily commenting the code and making a comprehensive README so future teams can integrate this into labs and add in the backend.

In the case that we progress slower than expected, features that we will make sure to have completed in order to deliver a product is two of the signal types for x(t) and h(t). We will focus on making the main page work as well, including displaying the graphs and equations correctly.