



DisConvReact Demo

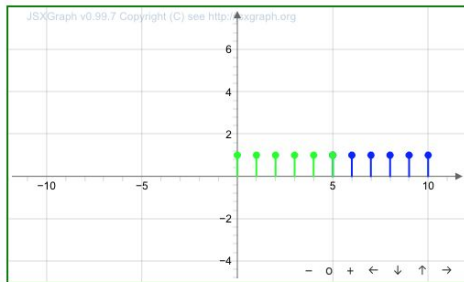
Fall 2020



Team Members

- Sean Crowley
 - 5th year CS
 - C, C++, Java, and Python
- Zihuan Wu (Mark)
 - 4th year CS
 - Java, Python, C and R
- Suma Cherkadi
 - 4th year CS
 - C, Java, Python and JavaScript

Discrete Convolution

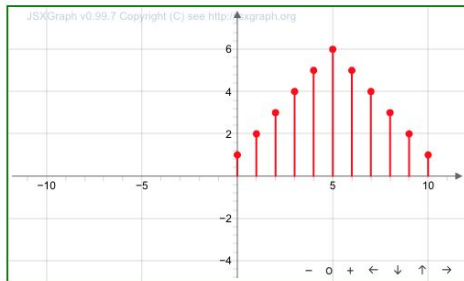
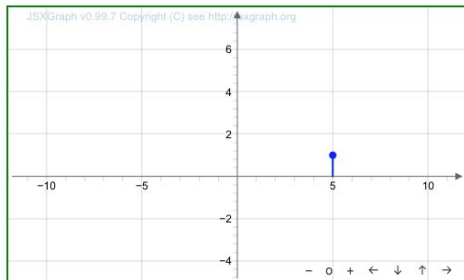


Function Type:
Amplitude:
Number of Samples:

Functions :

$$f(x) = a \sin(bx + c) + d$$

$$f(n) = ca^n - nd$$



Restore State

Save State

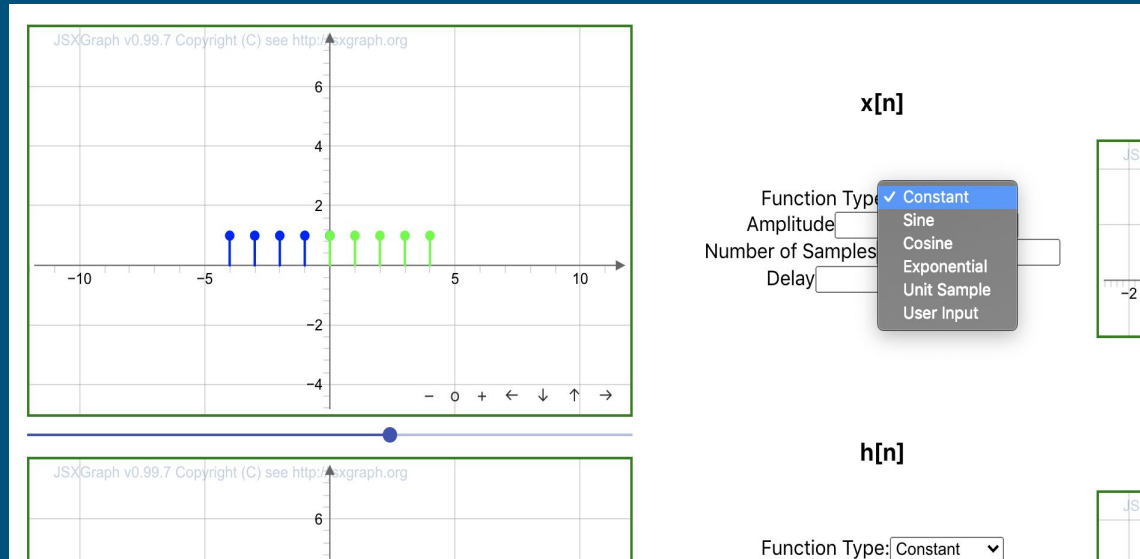
Old GUI - Spring 2020

Overall Goals

- Front End: Add functionality to match the original Discrete Convolution MATLAB GUI
 - Add more input signals for the two inputs
 - Display both input graphs separately
 - Allow the user to choose delay and which function to flip
- Grading: Attach the GUI to an autograder using Gradescope to allow the labs to be graded more efficiently
- Template: Create a React Template for future VIP students to build off of for other Lab GUIs

Front End - Signal Types and Layout

- Implement all six signal types
 - Two from last semester + Four from this semester
- Adjust the graph layout
 - More similar to what we have on MATLAB



Front End - User Interaction

- Improve user-input option and customization
 - More interactions with users
- Display all functions
 - Give users formulas to look up

Flip x[n] Flip h[n]

Functions :

$$f(x) = a\sin(bx + c) + d$$

$$f(n) = ca^n - nd$$

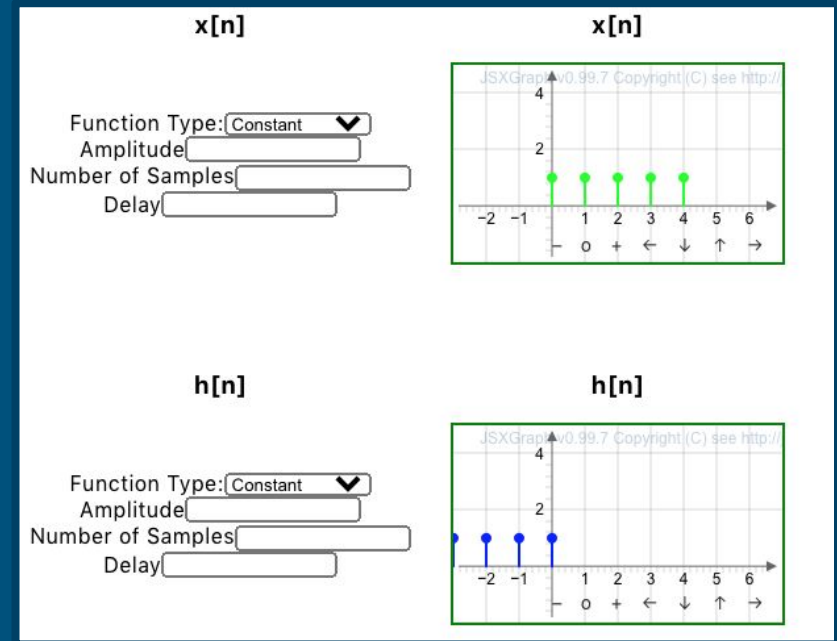
$$f(x) = a\cos(bx + c) + d$$

$$f(g) = c$$

User ID:

Front End - Separate Inputs

- Two separate input graphs displayed
- Two separate dropdown lists to control $f(x)$ and $h(x)$
 - The parameters of both inputs are customizable
 - Changes to these parameters immediately reflect on the respective input graphs



Front End - Flip and Delay

- Flipping
 - The user can choose which input to flip
 - The multiplication graph and the convolution both display the change
- Delay
 - Every input type (except User input) has the parameter delay - to shift the array by a given amount

Autograder

- Students will complete the lab through our GUI and save the state of their final solution.
- Students will then upload their “submission.json” file to Gradescope.



DEMO!

Next Steps

- Lab Template based on component setup
- Look at autograding from SQL directly
- Fix bounding boxes to make all graphs easier to view without extra manipulation