P5Live Functional Requirements

Model

Function Compile Python script.

Description Compile the user's Python source code for subsequent execution.

Inputs Editor text box value.

Source Controller - AJAX POST request handler for code submission.

Outputs New Python session.

Destination Model control loop.

Action Receive the code from the Controller associated with the text box value of the Editor segment. From there, compile the code and update the output streams should a syntax error be encountered. If there are no errors, then initialize a new Python session to allow execution to begin when a frame request is received; afterward, mark the program as running by setting a flag.

Requirements The network must be established between the client and the server.

Pre-Condition If Google webapp is used, connection/authentication needs to have been established before this function can execute.

Post-Condition If no errors had occurred, a session is created and frame execution is now allowed. A flag is also set to broadcast that the program is now in the running state.

Side Effects None.

Function Calculate frame.

Description Use p5 to calculate the next set of Vertex and Index buffers for the client to render.

Inputs Frame request signal.

Source Controller - AJAX GET request handler for frame request.

Outputs The calculated Vertex and Index buffers from p5. The I/O output streams of the Python interpreter.

Destination Controller - AJAX GET request handler for execution output.

Action Continue (or start) code execution using a wrapper for the p5 module that outputs the Vertex and Index buffers resulting from the triangulations calculated by p5. Should any errors occur during execution, or if the code does

any I/O, then the output and error streams are updated and passed to the Controller.

Requirements The network must be established between the client and the server.

Pre-Condition If Google webapp is used, connection/authentication needs to have been established before this function can execute.

Post-Condition None.

Side Effects Once a frame is calculated and sent to client, hang until another frame request is received.

Function Exit program execution.

Description Stop the currently running Python session.

Inputs Exit signal.

Source Controller - AJAX POST request handler for stop request.

Outputs None.

Destination None.

Action Force the current Python session to exit successfully. Afterward, set a flag to set the program as stopped.

Requirements A session must have been created and in the running state.

Pre-Condition None.

Post-Condition The session is closed on the server and the user's code is exited. A flag is set to broadcast that the program is no longer running.

Side Effects None.

View

Function Editor - Update text box.

Description Allow user interaction with the text editor segment.

Inputs Key value; Current focused object.

Source Controller - Key press event handler.

Outputs None.

Destination None.

Action Updates the text value within the Editor text box to reflect the input provided by the user.

Requirements The key value must be a valid ASCII character. The Editor segment must be the currently focused.

Pre-Condition The page must be loaded.

Post-Condition None.

Side Effects None.

Function Canvas - Render graphics.

Description Update WebGL session with buffer data calculated on the server.

Inputs Vertex buffer; Index buffer.

Source Controller - AJAX GET request handler for execution output.

Outputs Frame request signal.

Destination Controller - AJAX GET request handler for frame request.

Action Using the received buffers, update the WebGL session on the client's browser to display the graphics represented. Once completed, signal the Controller to make a request to the server for the next frame.

Requirements The code must be currently running and the user's code must have been sent to the server to be compiled.

Pre-Condition The page must have been loaded and a connection properly made to the server. The Controller must have sent the user's code to the server.

Post-Condition None.

Side Effects None.

Function Console - Update I/O.

Description Update the text content of the console based on the running Python session on the server.

Inputs Output text streams.

Source Controller - AJAX GET request handler for I/O streams.

Outputs None.

Destination None.

Action Receive the text values of any new lines written to the output streams. If there are any new lines, print them into the Console's text box.

Requirements The page must have been loaded and a connection properly made to the server. The Controller must have sent the user's code to the server.

Pre-Condition None.

Post-Condition None.

Side Effects None.

Function Panel - Submit code to server.

Description Copy the text box value of the Editor segment and send the text to the server to be compiled.

Inputs User source code.

Source View - Editor text box.

Outputs JSON stream of source code.

Destination Controller - AJAX POST request handler for code submission.

Action Format the value of the Editor text box as a JSON stream and submit the stream to the Controller so that it will be sent to the server. Once this is completed,

Requirements The text value must not be empty. The program must not already be running.

Pre-Condition None.

Post-Condition None.

Side Effects None.

Function Panel - Submit a stop request.

Description Allow the user to stop their running program.

Inputs None.

Source None.

Outputs Stop request signal.

Destination Controller - AJAX POST request handler for stop request.

Action Send a request to the Controller to notify the server to stop a currently executing Python session.

Requirements The user program must currently be running.

Pre-Condition None.

Post-Condition None.

Side Effects None.

Controller

Function

Description

Inputs

Source

Outputs

Destination

Action

Requirements

Pre-Condition

Post-Condition

Side Effects