Designer Manual for Obliquely Striated Muscle Length-Tension Prediction Application

Project Overview:

This developer manual was made for developers who need to comprehend the code behind the length-tension curve prediction application. The manual provides details into how the application was made, what the architecture is, and how it could be expanded. The application itself allows users to input parameters and view the length-tension curve of an obliquely striated muscle.

Application Architecture:

This application was made using HTML, CSS, and JavaScript for the frontend, and Flask (Python) for the backend. The app is currently being hosted on python anywhere.The file directory of the project is given below:

/project
/documentation
-Documents
/static
/css
-LTCurve.css
/images
-Images
/js
-LTCurve.js
/templates
-index.html
-app.py
-model.py

Files:

app.py: This flask app file contains all the server-side logic, it handles URL routing and request handling

model.py: This contains the python code that does all the math/science behind the application. This is the code based off the original MATLAB code. This file has a function that takes in all the measurements and returns the calculations from these measurements.

LTCurve.js: This contains all the client-side logic for the application, this handles all the functions of the buttons and form submission. The submit button captures all the parameters, runs the calculations and then puts all the parameters back into the html. The print button just calls the JavaScript print function to print the window. The share function utilizes the URL to and changes the URL for the values and graph that is currently on the screen, then copies that URL to the user's clipboard to be shared.

LTCurve.css: This contains all the CSS styling for the web application.

index.html: This file contains the html for the web page. It consists mainly of a body that has the background information as well as a container for the functioning part of the application. The GUI that is used by the users is in the container split in two sections, one for the parameters and one for the graph.

Setup and Installation:

To code/run this application locally you must have Python 3.8 or newer, Flask, numpy, and matplotlib. To run the application locally make sure you have the repository cloned on your machine, make sure you have flask, numpy, and matplotlib installed. This is all that is required to run the app locally.

Making Changes:

Once changes have been made to the code, you must update the files on the currently hosted python anywhere website, ensuring that the app.py file is renamed to flask_app.py for the website to run properly. Some future changes that can be made are adjusting the graphs to fit the curve appropriately, adding more parameters to affect the curve, and adding more calculations for other scientific graphs.

Code Location:

ConnorLevinson/LT_Curve_Obliquely_Striated_Muscle (github.com)