MTB semestral project documentation

main.m

Starting point of the program, creates the UI and sets up the callbacks.

- loadd()
  - checks whether the file in the uieditfield exists and is valid, tries to parse it and display the results
- calculate_doors()
  - calculate which doors the user wants to have displayed based on the checkboxes
- redraw(value)
  - redraws the doors with the given opening angle
- clear_ax()
  - clears the axes
- save_rot()
  - saves the data needed for the rotation of the sensors into the file ‘rot.txt’, only left side sensors are saved assuming symmetry on the y axis, the anonymous function to obtain the rotation matrix for a given angle is saved along with the parameter W which is needed inside it

parse.m

Script used to parse the data from the supplied file, this is done with regex and parsing of strings. Door variables are not preallocated, this done purely because of laziness, if the algorithm were to be run billions of times, it would of course be much more efficient to preallocate.

plot_door.m

Script which plots the doors’ outline along with the sensors based on their original position, position of the hinges and the angle.

plot_hinge.m

Script which plots the hinges along with the axis of rotation.

rotate.m

Script which returns an anonymous function, which calculates the matrix corresponding to a rotation linear transformation around the given vector and angle based on the Rodrigues’ rotation formula.