General Description: Here are the steps needed to operate the turntable apparatus.

Step1: Install rotary_table_1.ino using Arduino IDE to the ArduinoMega.
Step2: Connect the Arduino to the PC by USB cable.
Step3: Place the MATLAB functions in the same folder and run TactileOrientationTask.m (see description below).

File Descriptions:

Code for running programs:

Path: ~/Tactile Orienting Task_files/turntable/arduino/
Brief Description: Contains Arduino and library files required to operate the apparatus. Includes the main Arduino file (.ino) and 2 library files (.h, .cpp). Library files must be in the same folder as rotary_table_1.ino.

- rotary_table_1.ino <- This is the master code. Install this on your Arduino Mega
- motor_controller.h <- Contains basic information about the library functions and definitions for default parameters. Please put this file in the same folder as rotary_table_1.ino
- motor_controller.cpp <- Please put this file in the same folder as rotary_table_1.ino

Path: ~/Tactile Orienting Task_files/turntable/matlab/
Brief Description: Contains MATLAB function TactileOrientationTask.m required to operate the apparatus. Other related files do not need to be run, but must be in the same folder as TactileOrientationTask.m.

- TactileOrientationTask.m <- This is the main code for the tactile orientation task, written by *MATLAB GUIDE*. Please run this code.
- TactileOrientationTask.fig <- This is the design file of *MATLAB GUIDE* file for the main code. This code determines the GUI configuration of the program (such as the location of push buttons).
- Send_parameters.m <- Function to send parameters to Arduino. It will be run by the main code.
- Search_for_devices.m <- Function that searches for Arduino connected to the PC. It will be run by the main code.

Design files for building PCB board and behavioral apparatus:

Path: ~/Tactile Orienting Task_files/PCB/PCB_design_files_Altium_DXP_20/
Brief Description: Includes 7 files

- rotary_table_v2.pcbdoc <- layout files
- rotary_table_v2.SchDoc <- schematic files
- Mark_Library.PcbLib <- component libraries
- Mark_Library.SchLib <- component libraries
- rotary_table_v2.PrjPcb <- overhead files, contains basic project constraints and file structure
- 6mil_trace_12mil_via.RUL <- overhead files, contains design rules
- outputs.Outjob <- overhead files, generates manufacturing files

Path: ~/Tactile Orienting Task_files/PCB/PCB_fab_files/
Brief Description: Includes 4 files

- Pick_Place_for_rotary_table_v2.txt <- Component location information for automated assembly. The assembly was done by hand.

- Bill_of_Materials-rotary_table_v2.xlsx <- Bill of Materials
- Assembly_Drawing.pdf <- assembly drawing for reference
- Schematic_Prints.PDF <- schematic printout for reference

Path: ~/Tactile Orienting Task_files/PCB/PCB_fab_files/fab_gerbers_drills/
Brief Description: These are the files sent to the manufacturer to make the PCB (unpopulated). These boards were made at OSHPark.

Path: ~/Tactile Orienting Task_files/CAD/Assem3_all/
Brief description: These are the design files for the tactile orientation task apparatus and associated hardware. Please open Assem3_front.SLDASM in *SOLIDWORKS* to see the entire design and configuration of each component. The dimension of each component can be measured in *SOLIDWORKS* using the measure functions as needed. Please note that the design file might require adjustments/corrections to fit your environment.

- Assem3_front.SLDASM<- Master assembly file of all parts (listed below):
  - 190604_unicorn_headpost_v1_mirror.SLDPR
  - 190815 tuntable 14mm_v3_1.65mm_hole_side.SLDPRT
  - ANIMLA HOLDER TUBE.SLDPRT
  - ARM REST.SLDPRT
  - Base plate v1.SLDPRT
  - Colum.SLDPRT
  - headfix_joint.SLDPRT
  - Maxon Motor.SLDPRT
  - MOTOR HOLDER.SLDPRT
  - SK_Motorclamp.SLDPRT
  - MB12-Solidworks.SLDPRT*
  - PH3-Solidworks.SLDPRT*
  - RC1-Solidworks.SLDPRT*
  - RLA1200-Solidworks.SLDPRT*
  - TR3-Solidworks.SLDPRT*

* The design files were adopted from *Thorlabs, Inc.* (https://www.thorlabs.com/)

Please contact eazim@salk.edu for further details.

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