2018

Soft Tactile Sensor with Variable Compliance

STANDARD OPERATING PROCEDURE

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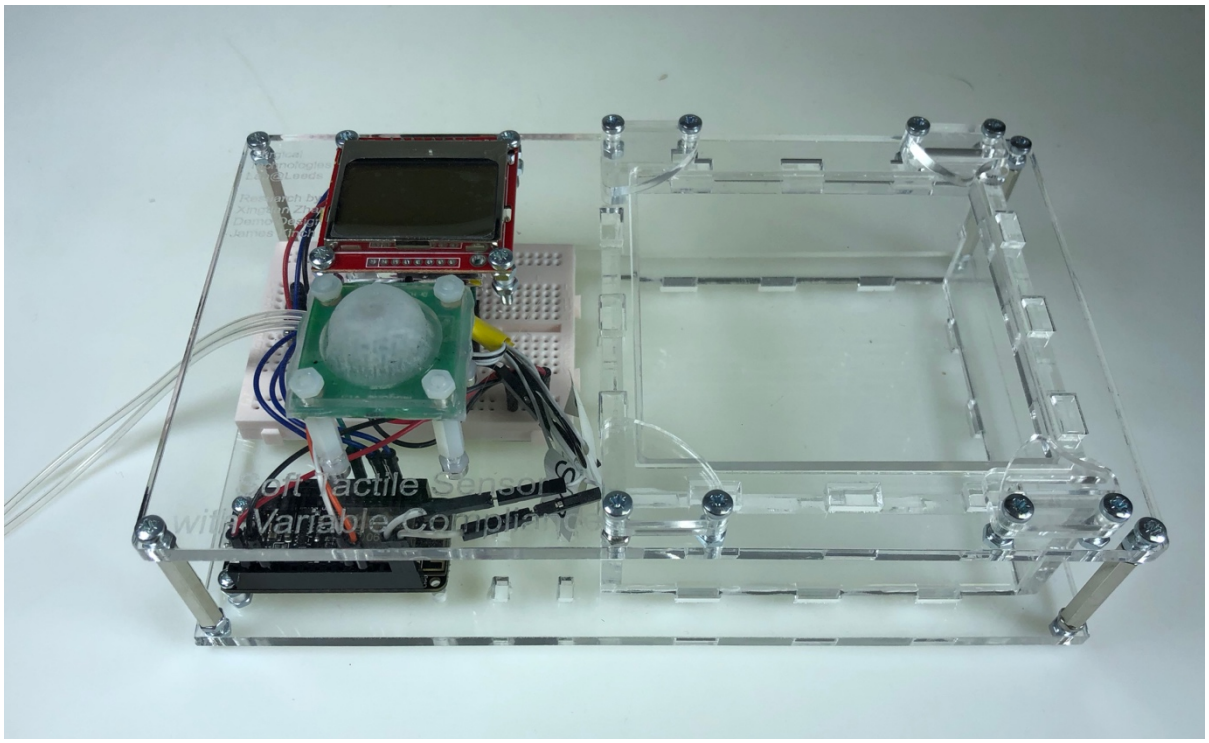
Introduction

This is the standard operating procedure (SOP) document for the Soft Tactile Sensor with Tactile Compliance Demo built by James Kinch on behalf of Xingtian Zhang and the Surgical Technologies Laboratory (University of Leeds).



In this document the setup, operation, system schematics, and file locations (within the supporting folder) are covered to provide an understanding of how to use the demo model and where to find the supporting (CAD and programming) files.

It should be noted that the demo presented in these images is not in its final form. Further changes are required to get the demo into a fully functioning state; these changes are given in the Future Changes document within the supporting files folder.

Setup

To set the demo up, a USB cable needs to be connected from the micro USB port on the micro-controller to a 5V USB power port (computer USB ports should be fine for this). Once this has been done, you should see the LCD screen turn on and start displaying information.

Operation

This section will need to be completed one the demo had been completed as the operation of the pressure pump and the pressure selection method has not been determined.

Components

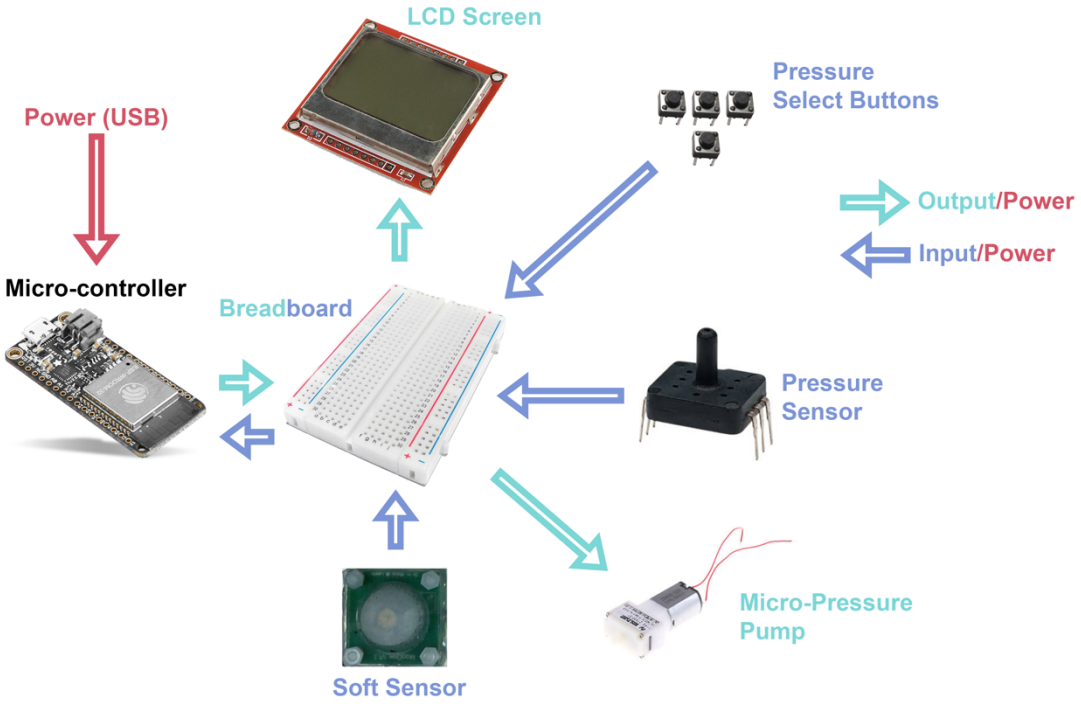
Only the primary components are listed here; components including Perspex, wires, and nuts and bolts are not given. These can be determined either through inspection of the

demo rig itself, or inspection of the CAD files (particularly the assembly file) provided as part of the supporting files for the demo.

Component	Quantity	Notes
Evaluation Board	1	Used for the inductive coils attached to the plyers
Sensor	1	
Pressure Sensor	1	Analog pressure sensor
Pressure Pump	1	
LCD Screen	1	Nokia 5110 LCD screen
Buttons		**For selection pressure (fill this out)**
Breadboard	1	8cm x 6cm size
Micro-controller	1	Adafruit HUZZAH ESP32 board

Schematic

The schematic presented here is a general overview of the electronics used for the demo rig. Specific connections to and from the various components are not given here. For further details on these, refer to the demo rig or the Arduino .ino program file.



CAD and Program Files

The supporting files for this demo are structured into two parts: CAD files, and program files. The CAD files are broken down further into three separate components:

1) **Acrylic Plate:** these files are the core components of the demo rig – i.e. the acrylic plates for the top and bottom. The assembly file shows the full assembly (excluding nuts and bolts) including the clips.

2) **Clips:** these are the clips used to enable an openable/closable plate for the plyer storage area.

Within the '**Program Files**' folder, there is only one file; Mark_Demo.ino. This is the Arduino IDE program file used to program the Adafruit Huzzah ESP32 micro-controller. For instructions on setting up the Arduino IDE, see here - https://learn.adafruit.com/adafruit-huzzah32-esp32-feather/using-with-arduino-ide