Proseminar Computer Haptic

Summer Semester 2019

Assignment sheet 1: Building Hapkit

Hand – out: March 15th, 2019

Hand – in: March 29th, 2019

1 OUTLINE

In this exercise, Hapkit – an open-hardware haptic devices – will be built and the first Arduino program is written to test and calibrate the Hapkit device. Each team of 3 students will build and present their own Hapkit device with all mechanical, electrical parts provided, under supports during proseminar. Students acquire data in the proseminar and finish their report as a homework.

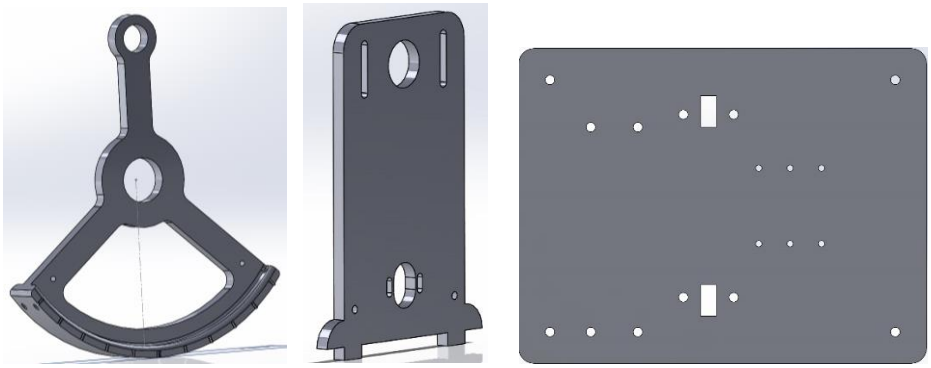
The main purposes of this exercise are to get a hand-on experience on building and calibrating a haptic devices, create the Hapkit device which will be used for the next 2 assignments, get acquainted with the programming environment.

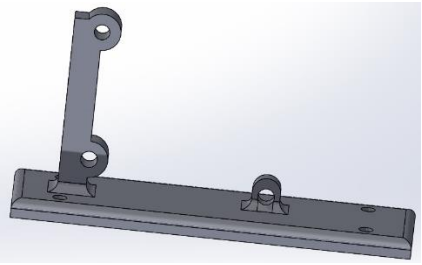
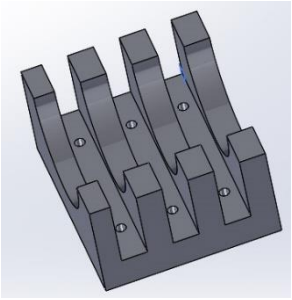
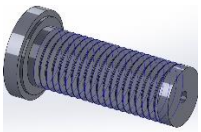
2 HAPKIT OVERVIEW

Hapkit is a low cost, easy to assemble open-hardware device developed by Stanford University. It allows users to input motions and feel the programmed forces in one degree of freedom. Some features of Hapkit:

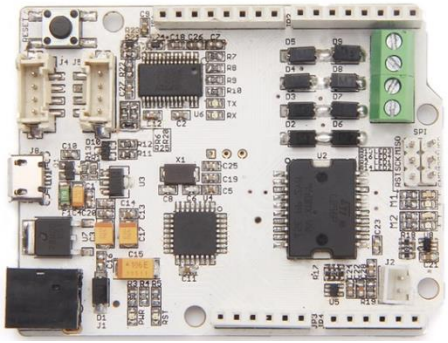
- One degree of freedom (DOF).
- Impedance-type force feedback: Users input motion and feel output force.
- Electromagnetic actuator: Most haptic paddles are driven by DC motors to generate torque.
- The user typically interacts with the device through a joystick-like handle.
- Easy to set up and program with Arduino IDE.

Mechanical parts:



Electrical parts:




3 TASK

The following tasks should be accomplished:

1. Build the Hapkit device from the provided components. All components should be tightly attached and the paddle can move smoothly.
2. Calibrate the hapkit: find the linear function to calculate position of the paddle from the measured value from magnetic sensor (updatedPos).
3. Record the paddle position and report the result.

Submission of your solution is due on **March 29th, 2019 at 11:59 pm**. Please submit report documents in a ZIP file via OLAT. In total, there are 15 marks achievable in this assignment.

4 TASK

For this assignment, all teams will have to present their results during the proseminar in **March 29th, 2019.**