ME 290 U – Interactive Device Design
HW2 – Text Entry Device

Git repository url: https://github.com/idd-fall17/hw2-EtiMrc

Code is located in ERGOTYPE_textEntryDevice.java file.

Type entry device:

ERGOTYPE provides an ergonomic experience of typing thanks to its user friendly interface combined with a text entry method that proved successful at the start of cell phones and text messaging era. The text entry method consists in using the same key to allow the user to select one letter among several that are assigned to that key (three letters by key in my case and for most cellphones using that method). To do so, he clicks once on the key to select the first letter, double-clicks to select the second letter, etc. This method enables to use a limited number of keys: nine of them are enough to have all the letters of the alphabet. I reproduced that principle on my prototype as it is an easy to use text entry method, that does not require a lot of training to be used efficiently and quickly. Yet, instead of providing tiny keys, close to each other, as most cellphones used to do, I designed bigger ones and placed them on an ergonomic platform that the user can conveniently grab with two hands. Doing so, his thumbs can easily reach the five keys placed on each side. The keys are placed on a circular arc so that they are easily reachable by the thumbs. I did not used the raw switches but rather built bigger keys on top of them to provide more comfort of typing to the user.

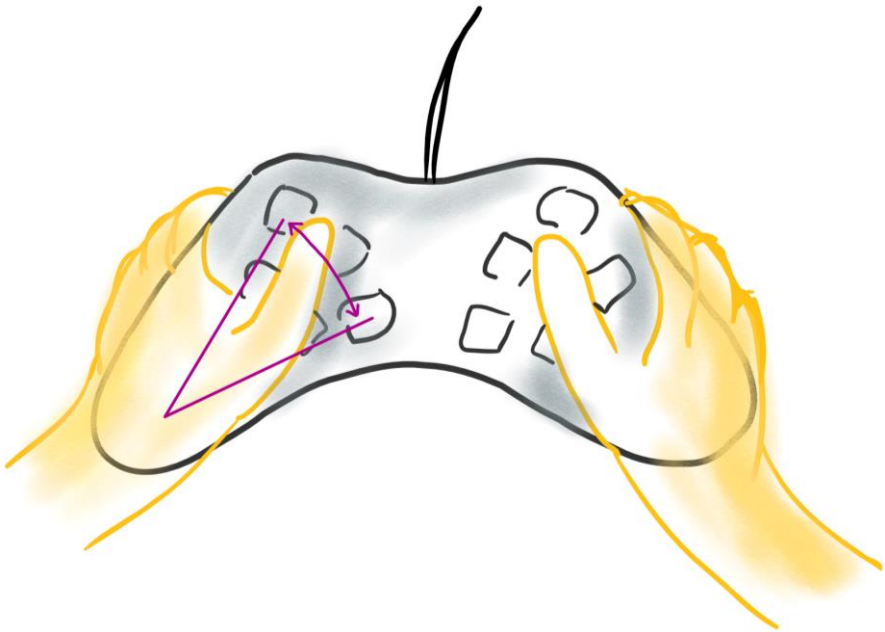


Figure 1 – Illustration of the ergonomic shape providing easy access to all keys of the device

Technical details:

Character recognition is simply implemented by detection of the number of taps on the same key during a preset delay.

The physical device is composed os stacked laser-cut profiles. This allows to provide an ergonomic and custom form factor to the user, with all electronics hidden inside between the layers. The principle of the assembly is illustrated bellow.

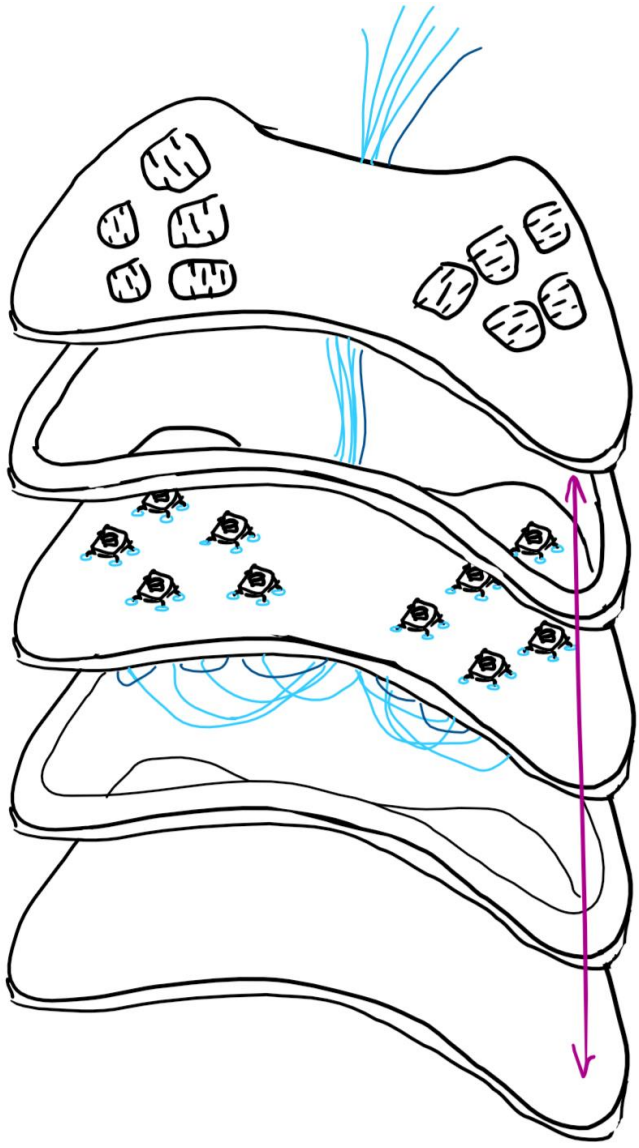
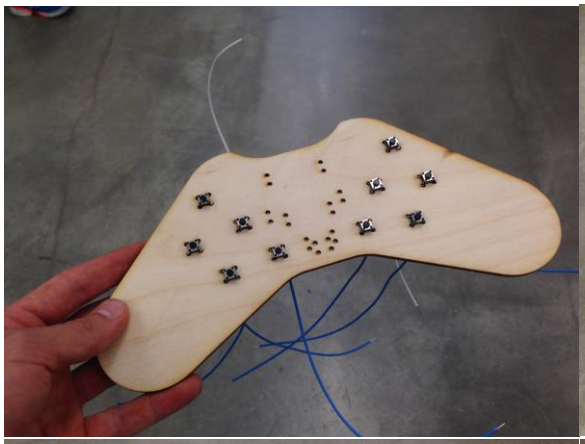
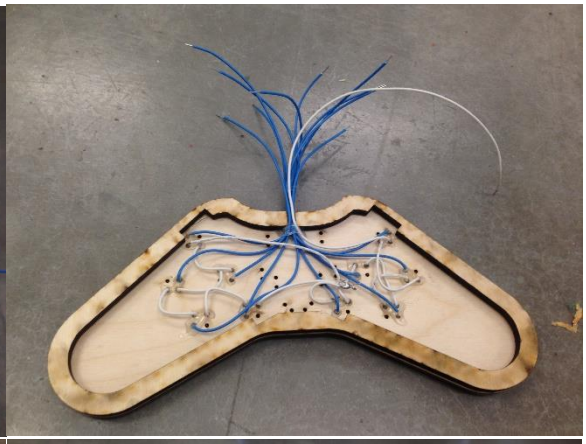
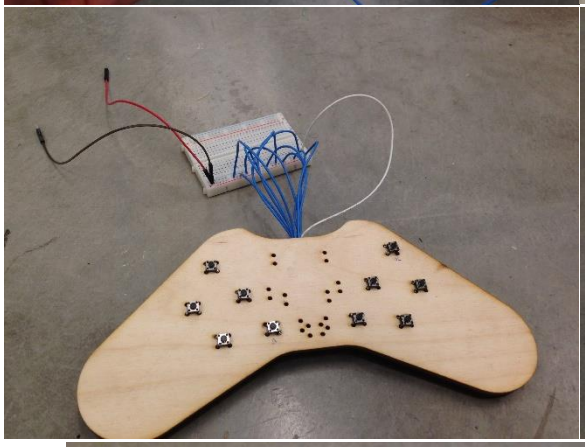


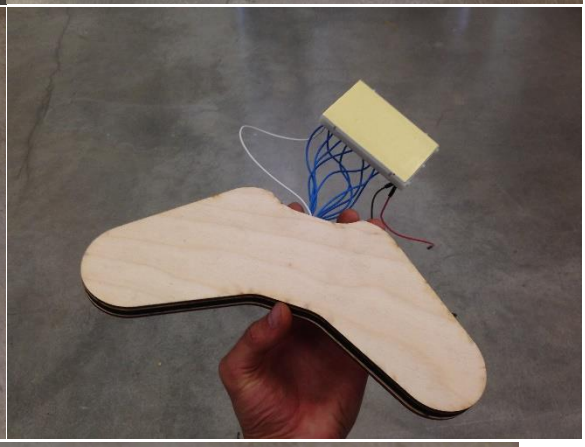
Figure 2 - Principle of the assembly of the device

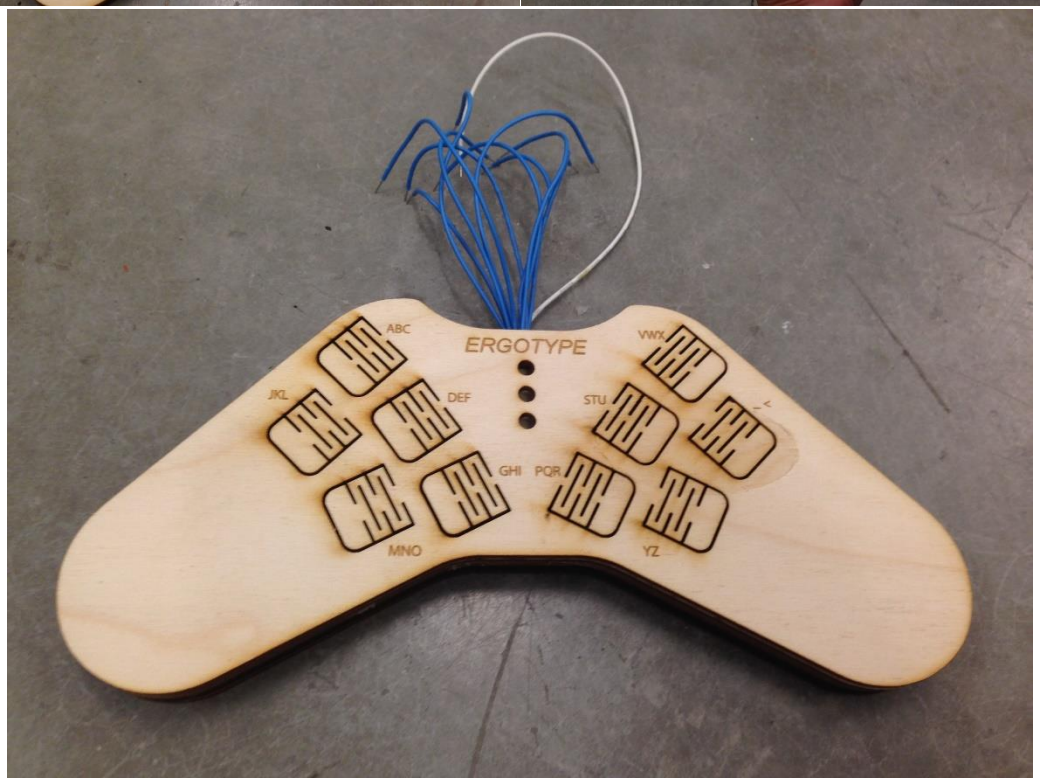
The photos bellow shows some assembly steps and the final device.










ERGOTYPE
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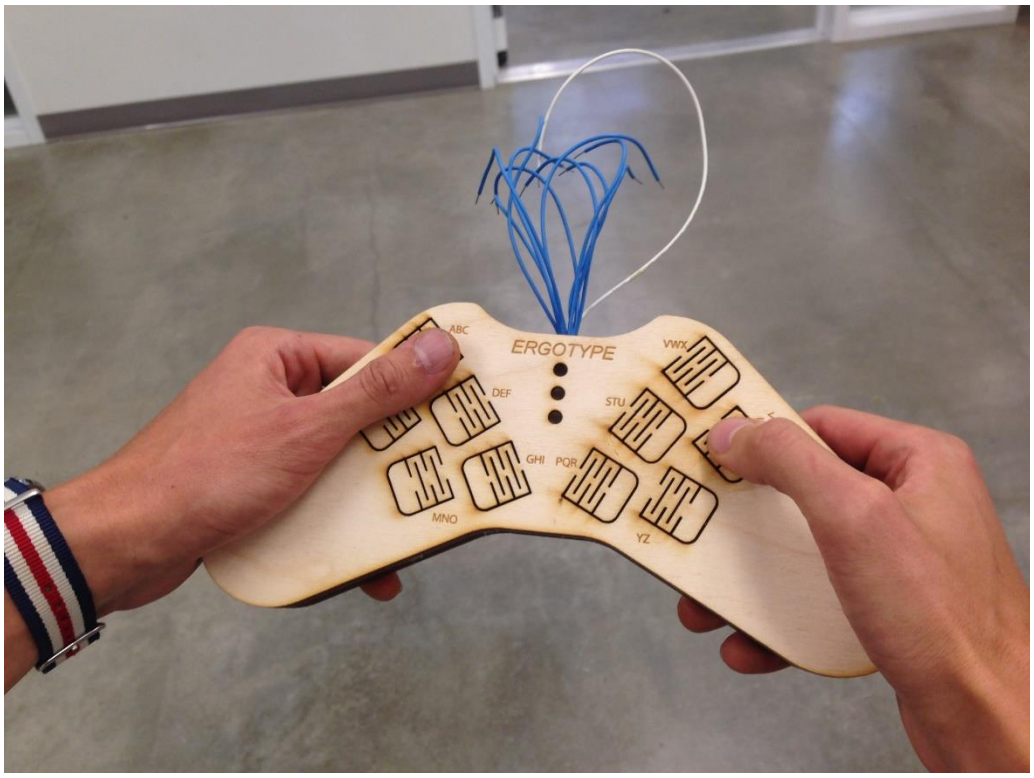

The following schematic shows for three switches the principle of the wiring diagram of the device:

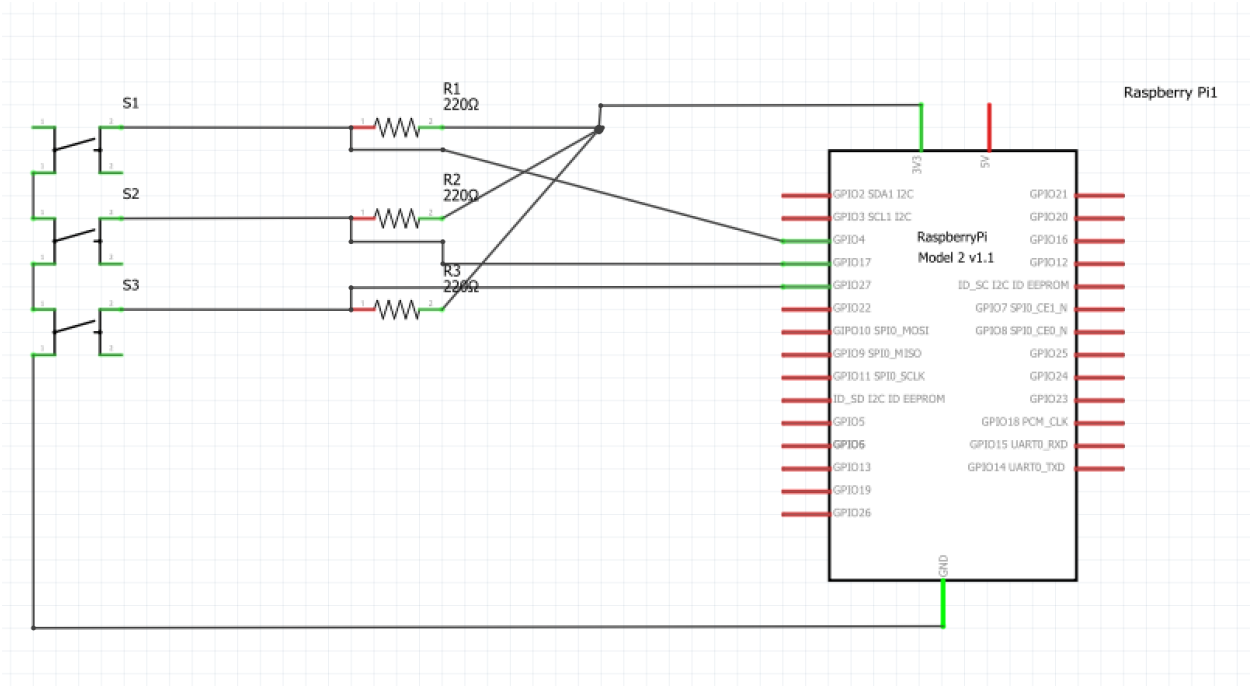

Figure 3 - Simplified wiring diagram (three switches)

Learnings:

I found this homework well calibrated in terms of timing and difficulty.

I am used to physical prototyping so this part did not present any difficulty. Though, it was a good opportunity to discover a design feature that I had never used: taking advantage of the flexibility of the wood (thanks to adequate laser cut) to realize the keys.

Moreover, I just have basic skills in electronics (Arduino) and feel I still have a lot to learn. This project helped me practice soldering, circuit design, debugging, etc. It was also a good introduction to Android studio, IDE that I discover, and a good way to review java code.