

Problem Statement

The traditional universal cuffs have these problems:

- Made with materials that are less flexible (e.g. Leather, Fabric)
- Measurement and fabrication to fit one's specific palm size takes time
- Cannot be cleaned with water & soap which leaves stains after feeding
- Consists of a pocket to hold the tools which hides germs and stain
- Only supports limited number of tools (i.e. they have to fit the fixed pocket size)
- The design focuses largely on the functional aspect, ignoring a consideration of aesthetics, which can cause embarrassment to users

Approach Considered

The idea of attaching tools to a bracelet stems from occasionally seeing a 3D-printed bracelet that is highly flexible. As the flexibility makes the bracelet applicable to various users with different palm sizes, we start to design modules that fit into the space in the bracelet.

The first attempt was a fail . We tried to make a linking compartment on the bracelet surface but it was broken because of the fragility of the linking compartment. The parts were not thick enough.

Description of Final Approach and Design

The cuff consists of mainly 3 parts: the bracelet by Emmett, the module and the holder.

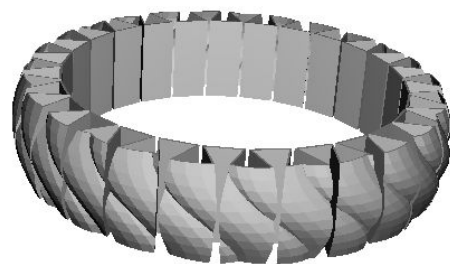
- 1) The bracelet is 3D printed, with a flexible dimension and a nice appearance with credit to Emmett on Thingiverse. The design draft can be found online and is open for use.

Stretchy Bracelet by emmett

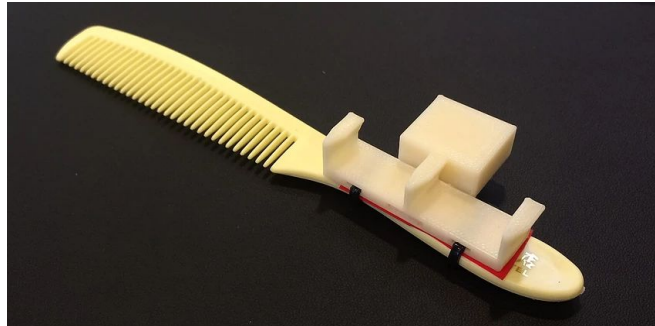
Published on November 11, 2011
www.thingiverse.com/thing:13505



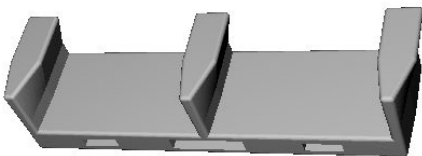
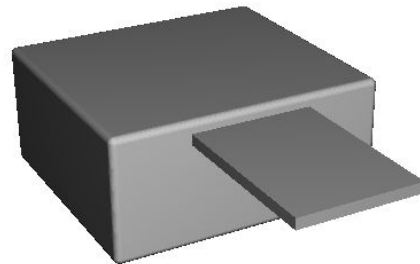
Creative Commons - Attribution - Share Alike



- 2) The module is designed by us, with the aim to act as the linkage between tools and the bracelet.



The module itself consists of 2 parts, the two parts need to be assembled and adhered together with super glue. The reason why it is in two parts is that the 3D printer we used does not support 3D model with 'overhang' parts, it actually can be printed together without any extra work to do with it when the 3D printer supports 'overhang' design.



Cable tie in 2.5mm is used to attach the tool to the module. To increase friction, a small Dycem® Non-Slip Mat can be put in-between (or rubber grip on a pen cut in halves also works).

- 3) The box is a supplement unit that supports users with limited hand function whom cannot put the modules on with hands.



4) Extra modules are also designed to cater for different uses.



It is a typing module that allows typing on a keyboard or using touchscreen, depending on the material attached on the tip.



It is a rigidizer that fits into the bracelet when the bracelet cannot catch the module firmly. To be applied when the user is with a palm size that is too small making the bracelet too loose.

Cost

The universal cuff is economic because it is 3D printed. Therefore, the cost would be solely on the material fee of 3D printing material. The cost is largely variable, depending on different material used. The below estimation is based on PLA filament on MakerBot.

		Estimated Cost
Standard Set	Bracelet *1	Around USD\$6.5
	Modules *2	
	Typing module *1	
	Cable ties *6	
	Dycem® Non-Slip Mat (6 cmx 8 cm)*1	
Extra Modules	Rigidizer	Around USD\$2
	Box	Around USD\$3.5

Significance

In the past, universal cuffs are leather or fabric bands with pockets that hold only a few tools, like spoons, forks and combs. The surface gets stained easily and cannot be simply soaked in water to clean, not to mention the pocket design that might hide food debris. The material also makes the design dull and unattractive. Moreover, tailor making a cuff specifically to fit one's hand is time-consuming.

Cuffit is not only a newly designed universal cuff, but a better one which can re-define the image of universal cuff. Universal cuff was refused by the majority due to the rooms of improvement we mentioned, and made a useful device being judged by its appearance. We design Cuffit to help people, once again, enjoy using universal cuff, to let the people gain benefits in using it and we have even made it better than before.

First, as the bracelet has an adjustable dimension. The bracelet can stretch and fit into different hand sizes. In other words, 'one size fits all'. This can also help saving the time and manpower involving in the traditional tailor making process.

Second, it is user-friendly. It is 3D-printed with PLA which is rather cheap in price. It also varies in colours and the user can make their own choice in matching different colours with different compartments. The users can also personalize the module with different areas of tools in their daily living with the colours. Users have many choices of tools. Any tools can fit the module can be used with the Cuffit. Not only for eating or writing, but also grooming and even doing cosmetic makeup.

Since Cuffit works perfectly well in water. The user may simply clean it by soaking it in water with soap and let it dry for a short period of time.

Compared with the traditional universal cuff, Cuffit will be much attractive. From the characteristics mentioned above, the user's self-efficacy can be boosted. Cuffit is aesthetically acceptable, it can reduce stigmatization, and it can increase the user's sense of accomplishment.

With the wide range of colours, it can promote the willingness of frequent usage. It serves as an accessory when not in use, and allow the user re-attaches to the social environment without being labelled in the public.

Acknowledgements and References

1. Bracelet by Emmett (Under licence of Attribution-ShareAlike 3.0 Unported)
On <http://www.thingiverse.com/thing:13505/#files>

Stretchy Bracelet by emmett

Published on November 11, 2011
www.thingiverse.com/thing:13505



Creative Commons - Attribution - Share Alike

