Created by Pernille Bjørn, Professor, Computer Science Department (DIKU), Human Centred Computing section, University of Copenhagen Denmark, email pernille.bjorn@di.ku.dk -
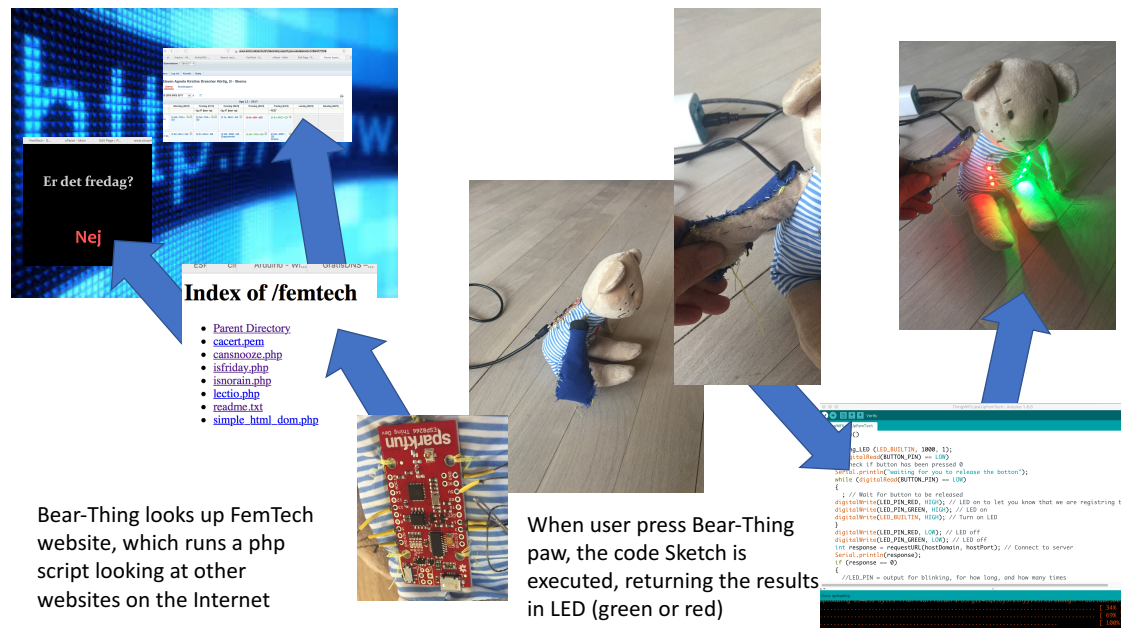
CyberBear – FemTech.dk DIKU

FemTech Hack and IKEA Bear into – 'Internet-of-Things'

The FemTech Cyber Bear-Thing is an 'Internet-of-Things' Teddy bear, which are able to connect to the Internet, and when the user push a bottom, the Bear-Thing looks up a website and communicate the result via blinking LEDs (red or green).

Bear-Thing looks up FemTech website, which runs a php script looking at other websites on the Internet

When user press Bear-Thing paw, the code Sketch is executed, returning the results in LED (green or red)

What kind of information can the FemTech Bear-Thing look up?
The FemTech Bear-Thing is able to look up the FemTech website:
http://www.circonflexe.dk/femtech/

and then run one of the following three php[1] scripts:
http://www.circonflexe.dk/femtech/isfriday.php
http://www.circonflexe.dk/femtech/isnorain.php
http://www.circonflexe.dk/femtech/cansnooze.php

It is important to notice that the websites alone does not respond to the question – it is only because we have the FemTech website, which runs the php script, which we have created and which parse the websites for the right answer.

Is it Friday?
The second script looks up the website http://erdetfredag.dk and returns the answer 'yes' or 'no'.

---

[1] A php script embedded within a website is a programming code, which is excuted when the call is written in the browser

Is it NOT raining?

The third script looks up the weather – default city is Copenhagen and answers 'yes' if the weather forecast says it is NOT raining, and 'no' if it is raining.

Can Snooze?

The first script links to Lectio of a given high school students at a given high school, looks up the time schedule for the current date, search through the content and identify whether the first classes that day have been cancelled. If they have been cancelled, the php script returns the answer 'yes', if the classes have not been cancelled it returns 'no'. So basically, the first script answer the question 'can I snooze?'

http://www.circonflexe.dk/femtech/cansnooze.php?gymId=[24]&elevID=[3432]

gymId=[Id number of the gymnasium]
elevId=[Id number of the student]

To find the Lectio ID of your school and of your own schedule, simply open a browser and logon to Lectio and look in the 'addresse-bar' in your brower – see example below:

Lectio looking up Allerød Gymnasion, and the student Line Poulsen (fake name)


Creating FemTech Bear-Thing

First step is to create a FemTech Textile bottom, and make sure that it runs with the current hardware/programming setup we already have.

FemTech Textile Bottom

For the FemTech Textile button, we use amazing work by Paul Strohmeier, and adjust it for our use. The important part is that we need to construct a textile button, which fits to the bear's right arm (seen from the back) and make pressure on the paw sent signals to the Thing, which then acts appropriately (as we coded earlier).

Also, it is important that the different wires (conductive threat) are not touching each other or getting crossed when we are sewn from the Thing to the textile bottom on the bear's arm.
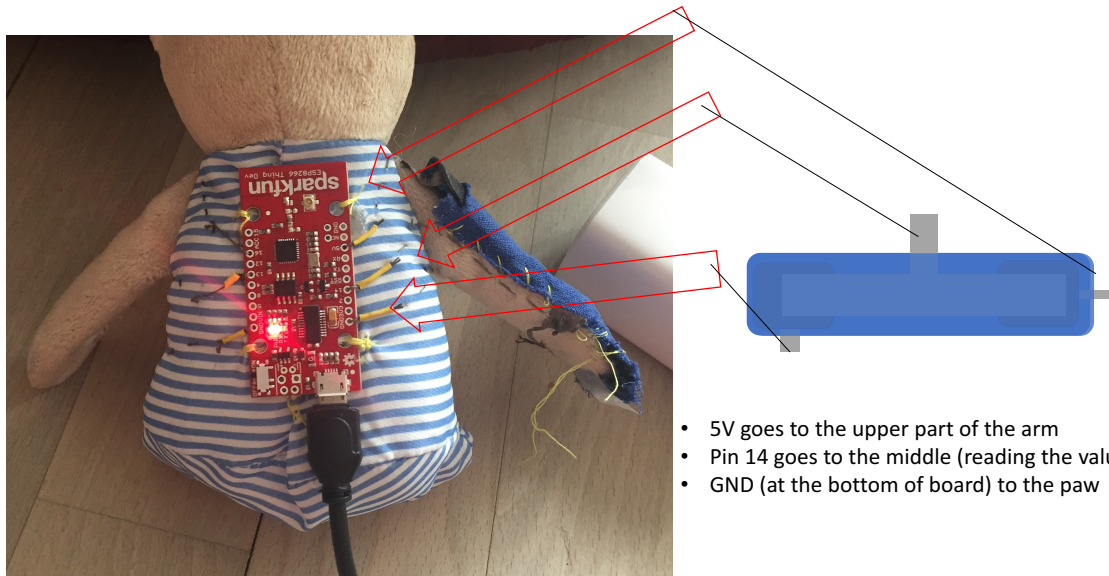
To do so you need to cut out the below template (in paper) and then use these to cut out appropriate pieces of fabric.
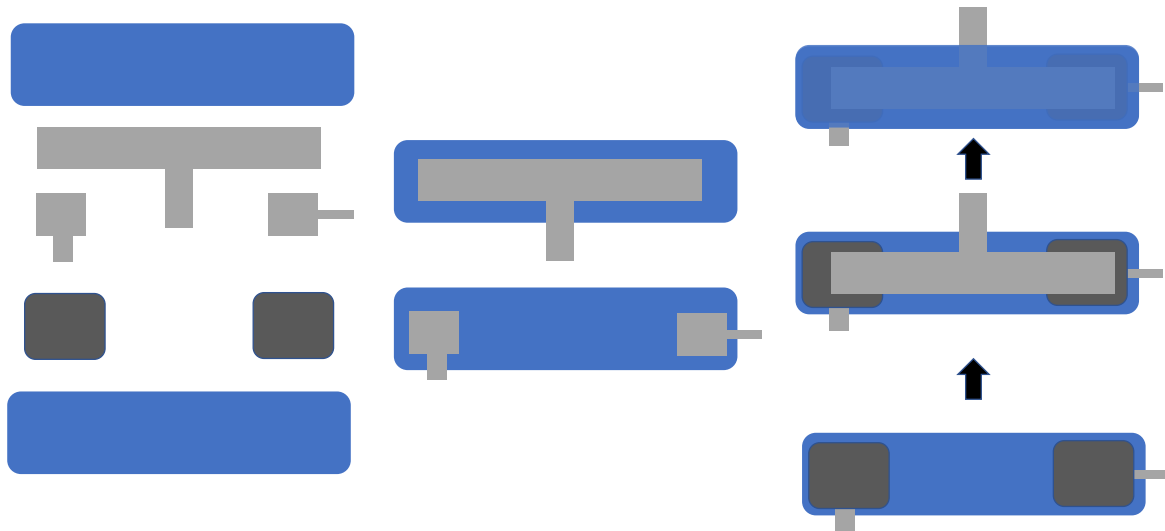
Paul Strohmeier's design

The textile bottom is designed to be placed in **the right arm of the bear (seen from the back)**, when the Thing is attached on the back, with the USB cable going downwards.

This mean that on the right arm of the bear on the top, next to the head is a stick out, which will be connected to 5V on the board's right side. The stick out at the paw should be connected to GND, and the one in the middle to pin 14.

- 5V goes to the upper part of the arm
- Pin 14 goes to the middle (reading the value)
- GND (at the bottom of board) to the paw

When the textile button works (it execute the programming code), then sew is on the Bear's right arm with regular thread. When attached – test it again (using tape) for the breadboard setup.

Wire up the Thing with conductive thread
Next step is to wire up the Thing with conductive thread instead of 'normal' wires – so we are detaching it from the breadboard.

We will place a long thread in each of the pins of the board, which we need to use – and we need conductive thread in pins 16, 13, and GND (on the left side of the board) and in pin 5V, 14, and GND (on the right side).
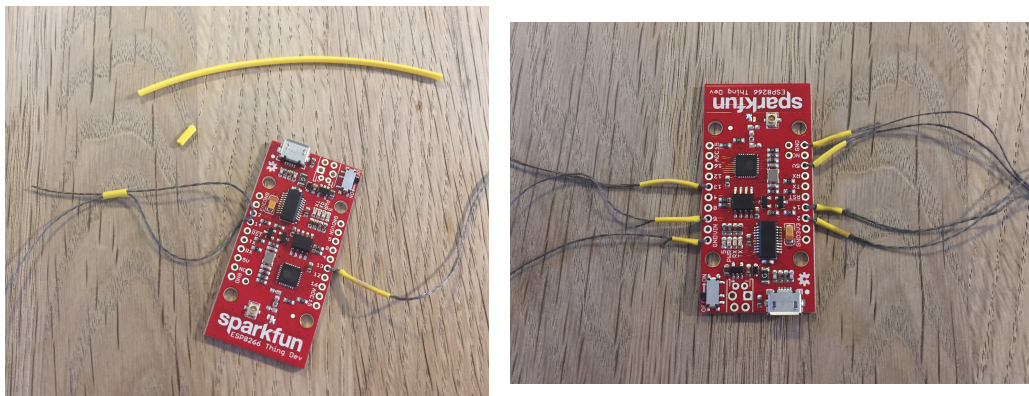
Pull conductive thread through all the pins we need, tie a knot and potentially put plastic flex on to make it stay. The end result you should have conductive thread in six pins (three on each side) using GND close to the USB socket.

When all the thread is attached, then test whether the button still works, by attaching to the three button pins (5V, Pin14, and GND) using tape to make it easy – potentially taping it all to the table. PLEASE BE CAREFULL – THE THREADS MUST NOT TOUCH OR YOU RISK SHORT CIRCUITING!!!

Created by Pernille Bjørn, Professor, Computer Science Department (DIKU), Human Centred Computing section, University of Copenhagen Denmark, email pernille.bjorn@di.ku.dk -

When you have tested that it works, we move on to attach the Thing to the Bear. Here we use ordinary thread and sew it on the back of the bear with the USB socket down (so the text 'SparkFun' in upside down).
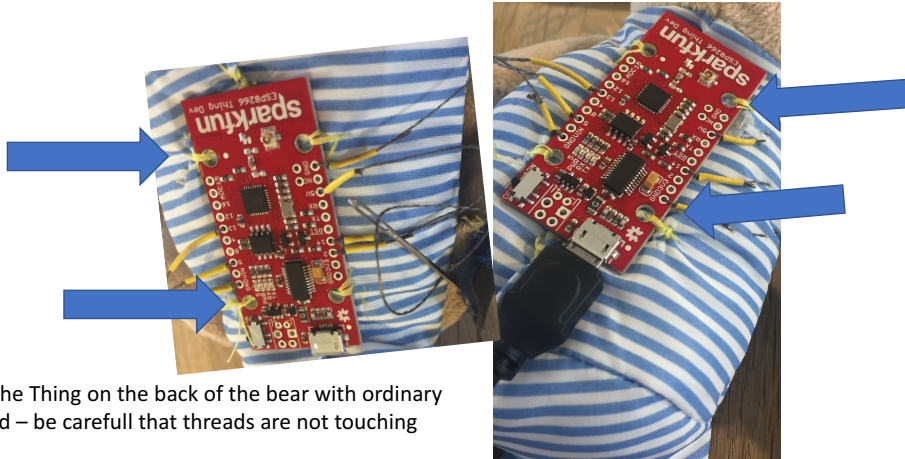
Sew the Thing on the back of the bear with ordinary thread – be carefull that threads are not touching

Then sew on and attach all the conductive threads from the Thing to the button on the arm and on the different LEDs, which should be placed on the front of the bear.
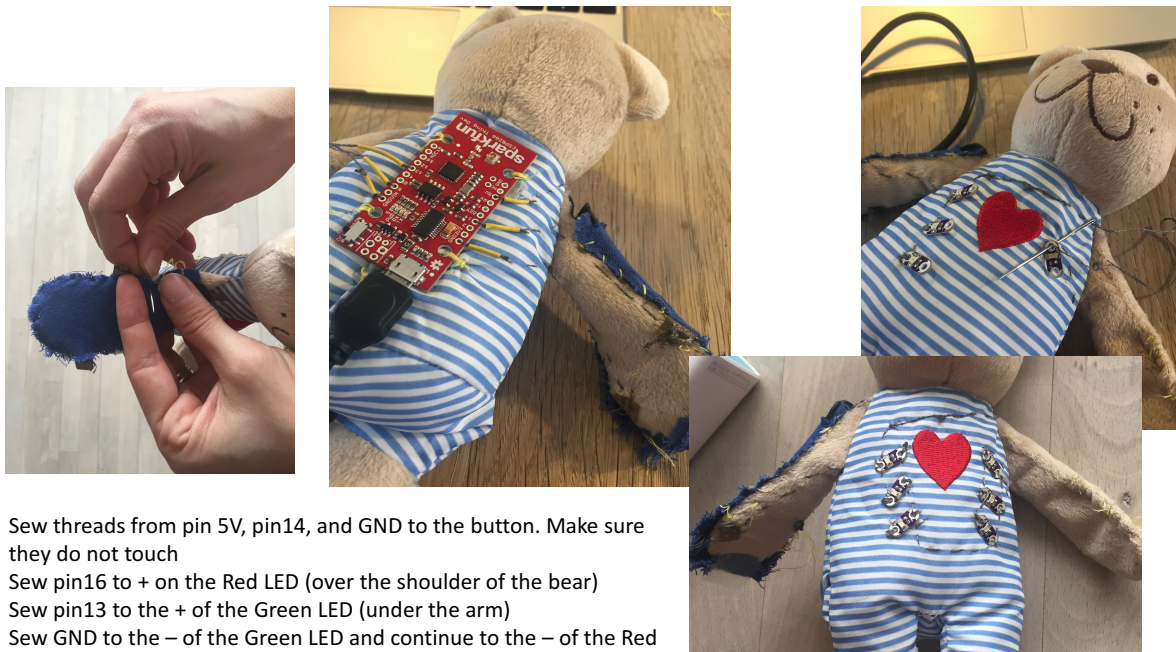
- Sew threads from pin 5V, pin14, and GND to the button. Make sure they do not touch
- Sew pin16 to + on the Red LED (over the shoulder of the bear)
- Sew pin13 to the + of the Green LED (under the arm)
- Sew GND to the – of the Green LED and continue to the – of the Red LED and end.

Now pimp up your CyberBear and give it a name – and sleep longer in the morning