For Makers Month 2017

Norwich Hackpace Techstyles workshop

In this workshop you will learn how to sew a conductive circuit and attach LEDs to fabric (eg a wristband) and then to a power source

Essential items are :

- output ie LEDs
- source of power eg battery - in this case coin battery in a holder
- conductive thread to get the power to the LED bulb
- optional extra - you can add a switch if you have time
- decorate!

1. Design your circuit

- Draw your design/circuit on a piece of layout paper with position of LEDs, thread and any embellishments - use red pen for positive and black for negative - get this checked! Will it work?

2. Make your band or whatever you want to make eg applique square

- Take a piece of fabric/prepared wristband
- Measure your wrist
- Add 5cm as an overlap
- Sew press studs/stick velcro into place to fasten
- Sew battery holder pocket into position on one end
- Draw your circuit path on the wristband or fabric (with tailor's chalk)
- Mark position LEDs on the wristband as part of the circuit
- Keep trying the band on!
- If it is not a wristband the principles are the same - somewhere to store the battery, a circuit and LEDs

3. Sew your circuit

- Thread a needle with conductive thread
- Sew the LEDs into position - note which is positive and which is negative
- Sew your connecting circuit, connecting pluses in a series then negatives in a separate series making sure that you do not cross threads – as this would cause a short circuit. That is, working from battery holder to LEDs as a string

4. Embellish your band or fabric

- Add whatever you want to decorate the wristband
- If you have time, you can add a switch using a bought switch, press studs or knots of conductive thread but we will explain that in the workshop

To make a circuit you need:

- sewable LEDs or normal LEDs (and a pair of pliers)
- 2032 coin battery
- coin battery holder
- fabric of any kind
- conductive thread
- embellishments

Optional

- flashing LEDs
- switch
- press studs to make a switch

Programmable circuits and microcontrollers

You can also make programmable wearable circuits but to do that you need a microcontroller board such as a Gemma, Lilypad, Adafruit - all made by Arduino. We are ot covering them in this workshop but you can look up tutorials on the web or wait until we run another workshop.

There are lots more of different makes and sizes but essentially they all enable you to download code to a microcontroller chip from your computer and then detach the computer so that you can wear your garment and walk around without be attached to anything. The microcontroller then tells the LEDs (or other output such as fan, sound modules etc) what to do. You can change the program and then re-download to the microcontroller.

If you can't write code, you can sometimes find code on the internet that you can copy and paste, which people have (kindly) made available.

Once you get the idea of creating these kinds of circuits, the possibilities are endless.

You could make:

- flashing gloves as inmdicators on your bicycle
- a lighting patch to press stud to your coat when walking or cycling
- a flashing dog collar for evening walks
- a club night badge or bracelet
- a light that comes on if your baby rolls on its front when asleep
- and many more

For membership of Norwich Hackspace see www.norwichhackspace.org