

Inspiration:

When I bike at night, I have a flashlight in the front and a backlight, but I worry that possibly that is not enough visibility. A solution to increase my general presence to cars therefore is to wear a jacket with LEDS embedded into them that can be switched on and off with various buttons on them.

Expected Materials:

A jacket. While it is possible to build one from scratch, if I know the components and internal structure of the jacket, it seems like it would be more efficient to partially destroy and refabricate from a normal one.

LEDs. Preferably I would acquire some LEDs bright enough to shine through the outer layer of the jacket, so I may keep them within the jacket and not have them suffer to the harsh weather conditions in Pittsburgh or wherever I am wearing them.

Sewable lightweight battery pack with battery. I need to wear the jacket, yet power the LEDs somehow.

Conductive thread. I need to be able to connect the power source to the LEDs, which I will place periodically within the jacket, presumably sown in parallel circuits.

Switches and sensors. I would like the jacket's LEDs to be off when I am not biking around at night, to save electricity, and more importantly not be a mobile beacon when it is not necessary. I would also like sensors on my jacket so I can transmit simple commands to my embedded LEDs with my hands, and also a sewable accelerometer for more automatic commands based on my speed.

Sewable Microcontrollers. I would like my LEDs to change color, such as the LEDs to turn red when I am decelerating, similar to a brakelight.

Scissors. I'll have to cut up my jacket and the threads used.

Expected Techniques and Concepts Used:

Smart textiles. I would need understanding of the various necessary electronic components and circuitry design.

Plotter cutting. Shapes of fabric would likely need to be exacting, which is easier to design on a machine.

Machine sewing. I'll need to piece the jacket back together after I assemble the electronics.

Hand sewing. Electronics will likely be too unwieldy to be machine sown, so I will have to integrate them by hand.

Sketches:

Sketch will be contained in a separate image file.