Project Light Sock

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# Executive Summary

The Light Sock will rest on the border between LED hackery and the performing arts. The device will include a handle with a long sock attached. Inside this sock will be strings of LEDs such that all sides will have a healthy representation. Now comes the magic. As the Light Sock is swung around, the LEDs will flare *in accordance* with the movement. Essentially, the more you move the Light Sock, the more it lights up. Acceleration will also influence the color of the lights. With a Light Sock in each hand and the spirit of kung fu, dance, or just plain spinning flowing through you, the Light Sock is a sure show for any performer.

# Features

Specific features that the product should implement. The parts of the whole.

Features include:

* LED system
  + Multicolored LED strips
* Control
  + On-off switch
* Robust chassis
* Activate LEDs based on vector acceleration
  + 0 – 10% – No light
  + 10 – 35% – Blue
  + 35 – 60% – Green
  + 60 – 75% – Yellow
  + 75 – 90% – Orange
  + 90 – 100% – Red

# System Diagram

A visual diagram and general description of how the system should work together. The whole.

# Hardware

Description of the hardware implementation. Assembly and Bill Of Materials.

[Diagrams]

[Bill of Materials]

|  |  |  |  |
| --- | --- | --- | --- |
| Part | Role | Price | Link |
| Long socks | LED holder |  |  |
| Addressable LED strip | Lights |  |  |
| Teensy | Data processor / LED controller |  | <https://www.pjrc.com/store/teensy.html> |
| ??? | Accelerometer |  |  |
| USB Battery (small) | Circuit power |  |  |
| Thread | LED anchor |  |  |
| Level shifter? | Inter-board voltage converter? |  | <http://www.digikey.com/product-search/en/integrated-circuits-ics/logic-translators-level-shifters/2556437?k=level+shifter&k=&pkeyword=level+shifter&pv64=1&pv1912=1&FV=1b880002%2C1ddc0002%2Cfff40027%2Cfff80215%2C1de80002&mnonly=0&newproducts=0&ColumnSort=0&page=1&stock=1&rohs=1&quantity=0&ptm=0&fid=0&pageSize=25> |

# Software

Description of the software implementation. Algorithms and data flow.

Continuous loop, execute the following at most 5 times per second.

* Get accelerometer data
* Compute vector acceleration
* Select color based on above
* Push the selected color the next LED