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411 Project Ideas

PROJECT 1

Project Name: WEIGHT WATCHER INSOLES
Product Area: Wearable electronics, fitness and health
Target Buyers: Anyone interested in watching his or her weight
Description:

- Weight sensor integrated with shoes insoles measures a person's weight and sends the data to a controller for processing.
- Weight displayed in kg, pounds, etc. depending on the client's preference, on a seven-segment display or LCD screen.
- Green LED indicates normal weight and red LED indicates obesity, depending on the client's height and age (could possibly use more LEDs for more states: under-weight, normal, obese etc).
- Might also indicate BMI and other metrics.
- Need to find a way to input user data (age, height, desired weight etc). Maybe small keypad
- Sensor can be in the shoe insole, the rest of hardware can be on a board connected to the sensor
- The insole could be made out of a sensor film or material like:
  http://www.adafruit.com/products/1917
  http://www.adafruit.com/products/1361

Hardware:

- Load cells, film sensor or other force sensitive resistor (FSR) for detecting weight / force
- A/D Converter
- Analog Amplifier
- Battery / Power source
- Microcontroller
- LEDs
- Seven-Segment Display or LCD Screen
- I/O (buttons, keypad, etc.)
- Other???

Software:

- Weight data processing, conversion etc.
- BMI and other metrics computations
- Output stage
- Other???

Note: If the sensor film is not precise enough to implement a good weight reading, we could try a variant of the projects on http://www.sensorfilmkit.com

Related Idea: Conductive clothes or other wearable. See conductive fabric at:
http://www.adafruit.com/products/1364

PROJECT 2

Project Name: COLOR DETECTION TOOL
Product Area: Design tool; Toy; Helper tool for blind people;
Target Buyers: Artists and designers, Kids up to 5 years of age (possibly more), Blind people

Description:

- Color detection sensor detects color, temperature and luminosity
- Color information processed by microcontroller
- Resulting Color RGB value can be used in three different situations:

1. Toy

  - RGB value (range of values) translated into a color name
  - Color name will be output to a speaker
  - This will help small children learn colors faster
  - Kids can grab an object, bring it close to the sensor, and will hear the name of object's color
  - Can potentially alert parent about color blindness problems

2. Artist / Designer Tool

  - RGB value displayed on a seven-segment display or LCD screen
  - Can be used if artist / designer sees a color that they want to use in their digital art / website and does not know its RGB code
  - Could be used in paintings authentication by knowing the exact color used by a specific artist in a specific artwork etc.

3. Helper tool for blind people

  - Associate RGB value range with a musical note / frequency
  - Color note will be output to a speaker
  - Blind people could "look" at a painting, for example, with this device and they would hear musical sounds
  - Potentially use an array of color sensors, and play multiple sounds at the same time (maybe too complicated)
  - Could exploit the sound / color relationship

Hardware:

- Color detection sensor
- Microcontroller
- Power source

- Voice synthesizer, speaker (depending on application)
- Codec chip (depending on application)
- Seven-segment or LCD Display (depending on application)
- Other???

Software:

- Color detection sensor driver and color data processing
- RGB value to sound / words processing
- RGB value to musical notes processing
- Other?

See products:

- http://www.adafruit.com/products/1334
- https://learn.adafruit.com/pianoglove/what-youll-need