2017 Learn 2 Teach /Teach 2 Learn Project Expo

Light It Up

Nikhia Davis, Trinity Merren, Chante Walker Mentor: Kiley Blodgett ***(Simmons)***
Assisted by retired CISCO engineer **George** ***Swallow***

To encourage children to get outdoors and be active, This 3D Printed Bracelet lights up with different animations as a child moves. Arduino IDE was used to code an Arduino Pro Mini. An accelerometer senses movement to control an output RGB LED strip and animations on a Bicolor LED Matrix. The wristbqnd was 3D printed with Ninja Semiflex filament.

Touchy Table 2.0

Nyari Davis, Malachi Freeman, Cheyanne O'Neal Mentors: Betty Elias ***(UMass Dartmouth)***
Assisted by Stacy Ogierumwense
An interactive table game that lights up and encourage human interaction. Arduino IDE is used to code a Sparkfun RedBoard microcontroller. A capacitive touch breakout board controls strips of ROB LEDs. The table was designed using LibreDraw & Inkscape, then fabricated in wood & acrylic on a lasercutter before being hand-painted.

Smart Plug

Gabriel Grajeda, Rian Toussaint, Khari Watson Mentor: Luisa Perez-Lacera (Worcester ***Polytech)*** The smart plug is a cost-efficient smart home solution for people living with low incomes. Outlets are controlled by a website and can be scheduled or directly controlled. Adafruit.io was used to host an online dashboard coded with Adafruit MQTT. An ESP8266(enabled with WiFi was used as the microcontroller, Electronics included relays to switch power on and off.

The case was designed in TinkerCAD and 3D printed on an Ultimaker.

Pac Go

Medhi Essakali, Salta Josiah Faeduwor, Jamie Nguyen, Sherley Valeus
Mentor: Sammy Jacobs *(UMass Lowell)*
A built-in multiplayer PacMan-style game that will be a possible MBTA community rail innovation to promote more human interaction on the train. A Raspberry Pi is used as a computer system to run the game, which is programmed in Scratch. A connected Arduino Pro Micro is used with button touch sensors as the game controller. The game controller was designed In Solidworks and 3D printed on a Makerbot.

Karen

Kureysha Abdulkadir, Johan Arias, Dyran Dias, Jovanna Grullon
Mentor: Thu Cao *(Tufts)*

A friendly robot gives inspirational messages to lift your mood & encourage. Arduino IDE was used to code a Sparkfun Redboard microcontroller. LED buttons are inputs that control an RGB LED strip, messages scrolling across a 20x4 LCD & a servo motor. Karen's body was designed in TinkerCad & 3D printed on a Makerbot. Her base is lasercut acrylic.

Children Tracking Accessory

Mentor: Kevin Lopez-Gomez *(Tufts)*
A portable GPS tracking device using geofencing technology that aims to help parents keep track of their children within an enclosed boundary. An Adafruit Metro Mini connected to an Adafruit Fona808 provides the microcontroller GPS capacity. The input is a GPS antenna and the output is a buzzer and an LED. Adafruit.io hosts the Internet connection. The wristband was designed in TinkerCAD and 3D printed on a Prussa 13.

Meditation Mandala

Kofi Baafi, Jordan Carter, Yvon Pierre
Mentor: Marc Pierre *(UMass Lowell)*
To calm a person's mood and reduce anxiety, this lamp is powered by breath & provides soothing music. Lights change colors with inhale & exhale to help the user focus on their breathing. Arduino IDE code is used on Sparkfun
RedBoard microcontrollers. A wind sensor provides the input to control a long RGB LED strip. A Codec shield connected to hacked headphones provides music

Ah Sleep

Danyelle Bentick, Dainyris Pimentel,
Paybo Mondjolo
Mentor: Tyla Smart (University of NH)

A compact alarm clock that uses pressure to detect that a person is awake. Arduino IDE is used to code a Sparkfun Redboard microcontroller. The input is a real-time clock is displayed on a graphical LCD touchscreen. Touch sensor buttons allow alarm time to be scheduled. A flex sensor is
used to communicate whether or not a person's head is on the pillow. The output alarm is a buzzer. The pillow was fabricated on a sewing machine.

doitlooklikelwasieftoffof boardandboujie

Spencer Thomas, Cypress Wilson
Mentor: Somtoo Ebele(UMass *Amherst)*

An interactive Arduino teaching game board that uses an RGB LED Matrix. Arduino IDE is used to code an Arduino Mega's microcontroller connected to an ESP8266. The website uses HTML & Javascript with NodeMCU as a host. The gameboard is a 32x64 ROB LED Matrix inside a wooden box designed using LibreDraw & fabricated on a lasercutter before being hand painted.

Special Thanks to our Tinkerer-in Residence Ming Kuo for assisting on all the projects!