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| Team | Project Title | Description |
|  | P5 RGB LED Matrix | Build a display using th 64x32 RGB LED Matrix (<https://www.adafruit.com/product/2277>).  I have six of these displays and a power supply. |
|  | Local Air Traffic Radio | I am interested in monitoring local air traffic via ADS-B signals. This can be done easily enough with free software and cheap SDR radios (RTL-SDR, and similar). In particular, I’d like to be able to monitor local traffic and filter the results for aircraft that might actually be visible out the window (so inside a small box and at a low altitude). Unfortunately, ADS-B operates on two bands, 1090 MHz and 978 MHz, so two radios are needed, and the software, dump1090 and dump978, produce independent lists of received aircraft. With some effort, there are provisions to plot these aircraft on a map and serve a web page, which would make a nice display, but no provisions I know of to run both bands simultaneously and combine the inputs. Ideally, the project would be to get software for both bands (two radios) running at the same time, combine the inputs and display them on a map, and then filter the lists and alarm when an aircraft passes through the “nearby” box so you can watch for it out the window. Note the stratux project does most of this, but outputs to an ipad for display and of course doesn’t filter the results.    Here are some relevant links:  <https://www.rtl-sdr.com/tag/dump1090/>  <https://www.youtube.com/watch?v=3jWmq8xAJiw>  <https://gist.github.com/fasiha/c123a9c6b6c78df7597bb45e0fed808f>  <http://stratux.me/>  <https://www.eaa.org/en/eaa/aviation-communities-and-interests/homebuilt-aircraft-and-homebuilt-aircraft-kits/resources-for-while-youre-building/building-articles/instruments-and-avionics/live-weather-and-traffic-for-less-than-$120> |
|  | Interface Touch Screen and SD card on 2.4” LCD screen | The 2.4” LCD screen we are using has a SPI-based resistive touch screen and a SPI-based SD card reader. This project will find find code that interfaces to these two devices and document how to use it. |
|  | Implement a DIY emergency button | (<http://spectrum.ieee.org/geek-life/hands-on/diy-emergency-button-hack-a-nikeipod-sport-kit-to-create-an-elder-alert-system>) |
|  | CAN interface | This project will develop examples using the CAN interface. |
|  | CAN bus data viewer | Web based interface for viewing data that is being sent over a CANbus connected to the can port. |
|  | Run LabVIEW on the Bone | (<https://forums.ni.com/t5/LabVIEW/LINX-3-0-LabVIEW-for-BeagleBone-Black-and-Raspberry-Pi-2-3/td-p/3278758>) |
|  | Run MATLAB on the Bone. | ([https://www.mathworks.com/help/supportpkg/beaglebone/examples/getting-started-with-beaglebone-black-support-package.html?searchHighlight=beaglebone%20tutorial](https://www.mathworks.com/help/supportpkg/beaglebone/examples/getting-started-with-beaglebone-black-support-package.html?searchHighlight=beaglebone tutorial) and [https://www.mathworks.com/help/supportpkg/beagleboneio/examples/getting-started-with-matlab-support-package-for-beaglebone-black-hardware.html?searchHighlight=beaglebone%20tutorial](https://www.mathworks.com/help/supportpkg/beagleboneio/examples/getting-started-with-matlab-support-package-for-beaglebone-black-hardware.html?searchHighlight=beaglebone tutorial).) |
|  | Web Face Recognition | Recognize faces and send them to web based database. Can view captured faces on website. |
|  | Tweet-a-Watt | <https://learn.adafruit.com/tweet-a-watt/> |
|  | Presidential Tweet Analyzer | Build a device that downloads the president’s tweets, analyzes them and lights a display in response. |
|  | PocketBeagle – Grove Kit | Do something interesting that fits in a small mint tin.  <https://beagleboard.org/Kits/Grove> |
|  | BeagleBone Battleship | We will implement the battleship game using 2 bones. We will be utilizing the LCD screens for both Beaglebones. Potentially will run the game on a web page and have the beaglebones retrieve the info from there |
|  | Pinball machine | A pinball machine that has servos, buttons, lights, and a scoreboard, all controlled by the Bone. |
| James Werne | Sudoku Solver | We will use the beaglebone to solve a sudoku puzzle.  <https://www.hackster.io/msana/sudocam-ku-dd50b4> |
|  | BoneSAW | We will write a network utility to detect vulnerabilities in networked BeagleBones. Typically these will be a misconfiguration of some sort. We will also apply this to specific networked examples found on shodan and notify device owners of issues. |
|  | Server PDU | A rack mounted box with relays and stuff that can monitor wall power usage and show stats. |
|  | Advanced DRO | A box that can read position data from a Bridgeport mill with instrumentation on its axes, and provide enhanced readout, or log datapoints to serve as a rudimentary CMM.  <https://hackaday.com/2017/05/26/making-an-inexpensive-dro/> |
|  | Easy DAQ | Low-cost, easily configurable DAQ system for common projects; include quick readout, sophisticated datalogging, and easily configurable alerts (IFTT?) |
| James Werne | RFID Scanner | Interface an RFID scanner to the BeagleBone that can read tags and then display a person specific prompt on the resistive touch screen. |
| James Werne | Bluetooth Speaker / lights synched to music | Build a bluetooth speaker using the BeagleBone as the control. Interface the board with a speaker, bluetooth, and build an enclosure. If possible, interfacing the system with lights that would be synched to the music would be cool.  <https://www.instructables.com/id/Homebrew-sonos-music-box-sort-of/>  <https://gist.github.com/jadonk/d05d96243bc26b3c08a5293d29f78839>  <https://www.jeremyblum.com/2014/12/17/littlebits-hue-lighting-controller/>  <https://www.digikey.com/en/maker/blogs/beaglebone-green-wireless-playing-music-through-a-bluetooth-speaker-or-headset> |
|  | RGB LED Matrix with Accelerometer | <https://www.adafruit.com/product/3649> |
|  | RGB LED Matrix inside Graduation Cap | <https://imgur.com/gallery/xr0P0> |
|  | Smarthome lights with wifi modules | [https://www2.meethue.com/en-us/products.starter-kits#filters=STARTER\_KITS\_SU&sliders=&support=&price=&priceBoxes=&page=&layout=12.subcategory.p-grid-icon](https://www2.meethue.com/en-us/products.starter-kits" \l "filters=STARTER_KITS_SU&sliders=&support=&price=&priceBoxes=&page=&layout=12.subcategory.p-grid-icon) |
|  | 7” touchscreen GUI for sensor data and button | Interfacing the 7” touchscreen. Reading & displaying sensor data: Temperature and Battery Voltage. Additionally controlling Output LEDs via Buttons on the touchscreen. |
|  | LED panel games | Using the panels Dr. Yoder has, would make games such as snake, Frogger, maybe pac-man. Depends on the time we would have.  <https://hackaday.io/project/6063-led-panel-video-games> |
|  | Weather Station | Do a weather station that reads some sensors or pulls information of a website to parse.  <https://www.hackster.io/carmelito/inside-outside-weather-station-d68405> |
|  | One way mirror | Set up a one way mirror to project/show weather or other information.  <https://www.hackster.io/asoomar/smart-mirror-559755> |
|  | Alarm with remote speaker | Have an alarm set up on a dresser which connects to a speaker either wirelessly or via cable (my concern is maybe wireless speakers are always reliable). The speaker is next to the bed. When the alarm goes off, you have to get out of bed to go to the alarm to turn it off. |
|  | Audio synthesizer | <https://beagleboard.org/p/112305/bela-low-latency-audio-sensor-cape-for-pocketbeagle-1615e0>  <http://performermag.com/best-instruments/best-music-keyboards-synth/hack-the-ti-beaglebone-black-to-make-your-own-diy-synth/> |
|  | PS1 Emulator Console | Have a ps1 console emulator set up onto the beagleboard and control the games using a connected ds3 controller. It will also be able to display onto monitors or TVs.  SNES Emulator (example)  <https://www.hackster.io/hendersa/beaglesnes-the-embedded-beagleboard-snes-emulator-547626> |
|  | Solar Controller interface | Reading data (Charging rate from solar panels and Discharge form Batterie) from Victron Solar Charge Controller via Bluetooth and displaying it on the beagle https://www.amazon.com/Victron-SmartSolar-Charge-Controller-Bluetooth/dp/B075NQQRPD/ref=sr\_1\_3?ie=UTF8&qid=1538513415&sr=8-3&keywords=solar+controller+mppt |
|  | LED Dimmer control (>2A) | Dimming a LED Stripe via capacitive touch button with beagle https://forum.mysensors.org/topic/2834/single-button-operated-led-strip-dimmer |
|  | Smart Electric Panel | Monitor the electrical current coming from each breaker and control each breaker wirelessly with a relay.  Possibly setup a breaker configuration for backup power in the event of a power outage. |
|  | Cloud Controlled Robot | Use a web interface to control a robot motion’s. Have the beaglebone send a camera feed and status back to the web server. |
|  | Pictochat | Use the touchscreen to send drawn messages between beaglebones. |
|  | Espresso Machine | Use a combination of servos and an lcd to take orders and make a cup of coffee. Also, create a website that is capable of taking these orders and sending them to the machine. |
|  | Object Recognition | Use tensorflow and OpenCV to detect and track items in the frame of a camera |
|  | BoneBot | Build frame with wheels and power source for the BeagleBone, use Blynk to create simple Android interface for controlling |
|  | Security Camera | Build a simple security system using the BeagleBone and a webcam. Likely using Motion for video processing and Blynk for notifications and control. |
| (James’ Idea) | Remote Bluetooth camera | Interface a camera attached to the BeagleBone to your smartphone using Bluetooth. <https://www.hackster.io/alf81010/arduino-bluetooth-camera-abc-107c3d> |
| (James’ Idea) | Radio Station Receiver | Pinpoint a location on a globe. Using those coordinates, the BeagleBone triangulates radio signals near that location, and you can use a tuner to pick up on local radio stations in that region.  https://magpi.raspberrypi.org/articles/radioglobe |