AS Arduino Model Flight ...

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Arduino-Driven Model Flight Simulator

LS Leo Salemann 12/9/2018 Revisions Edit page + New

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Overview

Design & Architecture, Alternatives

Arduino as Motion Platform

- All it does is move the platform (2DOF, maybe 3DOF)
- Depend on motion to operate the sim.
- No throttle or anything like that (unless robo-pen)
- All the stick has to do is talk to the arduino and ervos

Arduino as Motion Platform AND Game controller

- Arduino sends bluetooth signals to the phone
- Basically build an Arduino bluetooth game controller that also moves a platform.

Arduino as USB-to-Bluetooth Converter

- Super-hard way, Read USB
  - Get stick & button inputs form USB
  - Translate to Bluetooth
  - Also move the platform as a side-effect

Input Devices

Lots of options; need to find the right point in the {cool, easy, cheap} space.

USB Joystick

- The most desirable; the most complex. Seems to require sophisticated boards, a sir probably won't do.
  - Main Arduino discussion post
    - First thing they reference is Gravitech, which leads you to their full-size ve leads you to Circuits@home
      - Alternate place to purchase site is TKJ electronics $34 USB Host Shield
    - Article also linked to Circuits@home github repo
    - Has libraries for PS3, PS4, Wii, XBOX controllers
    - Best to look at all of Oleg's Github Repos then try USB_Host_Shield_2.0 an
    - Circuits@home has an example with Logitech 3D
    - Circuits@Home blog page includes an announcement of host library 3.0 or Most recent changes are 17 days ago.
    - The big risk is getting my current sticks to work. This google search sugge Cyborg is a HID.
    - Sparkfun makes a BOB-12700 that just breaks out the four wires, but I don't t code to deal with it. Available at Mouser
      - There's an Arduino forum post that dissuades you from reading D+/D- d recommends the good ol' Circuits@home USB Host 2.0 shireld.
- Pinouts.ru has a good USB article
- Another source is Hobby Electronics for L14.95 = $19.22
  - Not sure about cost.
  - arduino code seems simple

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Old-School PC Joystick

- Seems more tractable, and I do have a yoke.
- promising pinout link
- [build its has a blog article with full wiring] (http://build-its.blogspot.com/2012/01/ar port-interface.html)

Bluetooth Game Controller

- I've got the shield, maybe I can read & parse gamepad data.

Cost Considerations

- USB is the highest cost; highest risk.
- Bluetooth is free (I have one), also high risk
- Sampling pins off my PC joystick should work; easy to test.
- Basic Thumb joysticks easiest to buy/use. That's my fallback.

Getting Iterative with Input

1. Control one servo with a pot
2. Sample pins from PC joystick, see what can be done.
3. Control servo with one PC joystick axis
4. See what I can read from bluetooth game controller

More links

- connecting PS2 controller looks easy
- connecting gamepad to arduino (uses weird libraries)

Design Artifacts

TinkerCAD Project

Even More Links

https://allpinouts.org/pinouts/connectors/input_device/joystick-pc-gameport/

http://build-its.blogspot.com/2012/01/arduino-game-port-interface.html

https://www.reddit.com/r/arduino/comments/ps71v/why_does_my_servo_make_a_clickin

https://www.wikihow.com/Wire-a-Potentiometer

https://www.tinkercad.com/things/ehMveOIekxN-copy-of-3-servos-driven-by-pots/ed tenant=circuits

https://learn.adafruit.com/introducing-adafruit-ble-bluetooth-low-energy-friend/ble-se

https://learn.adafruit.com/introducing-adafruit-ble-bluetooth-low-energy-friend/ble-se

https://github.com/adafruit/Adafruit_BluefruitLE_nRF51/pull/37/files

Bluetooth/Bluefruit links

Factory reset https://learn.adafruit.com/introducing-the-adafruit-bluefruit-le-uart-frien reset

Mouse move https://learn.adafruit.com/introducing-adafruit-ble-bluetooth-low-energy services#at-plus-blehidmousemove-14-35

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