Aerial Oculus
User Documentation

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Set Up

In order to set up this project, you must first copy the source file and its makefile to the same directory on the Raspberry Pi. Then, you must make sure that the linux V4L2, frame buffer, and joystick drivers are installed on the Pi. Also make sure that the standard C math library is available on the Pi. Once the required drivers and libraries are installed, you can simply run make which will compile program. Then, plug in the cameras, the micro controller, and any generic gamepad into the Pi through USB. The Oculus will need both a USB and HDMI connection. Most likely you will need a USB hub to fit everything.

You will also have to make sure that you have read and write permissions for all the devices. The micro controller will show up as /dev/ttyACM0 and the gamepad as /dev/input/js0. You'll also have to have the read/write permissions for the framebuffer which will show up as /dev/fb0.

The cameras need a specific setup in order to work with the program. The blue tilt-pan system will have blue, green, and yellow wires for the pan motor, and orange, red, and brown wires for the tilt motor. These wires will have to be plugged into channels 3 and 4 of the micro controller respectively. The red tilt-pan system will have green, blue, and purple wires for the pan motor, and grey, white, and black wires for the tilt motor. These wires will have to be plugged into channels 5 and 6 respectively. Make sure that the blue, orange, green, and grey wires are plugged into the signal header of their respective channels.

The cameras will have to be set up such that the blue tilt-pan system is acting as the right eye, and the red tilt-pan system is acting as the left eye.

Finally, you will have to plug in the Oculus into power as well as the Raspberry Pi.

Once these requirements are met and the program has been compiled, you will be ready to use the program.

Use

Using the system is easy, simply move the right joystick to move where the cameras are looking, press the A button to record a photo to the local directory, and bress the 'back' button of the game controller to stop the program.