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README

The kernel side of the project runs the ultrasonic sensor continuously using a timer and gets the distance using interrupts on echo pin. The user side uses the SPI interface (spidev) to communicate with the led grid. It reads the distance value from kernel side every 120ms and displays appropriate bars on the display. On pressing Cntrl+C, the program is cleanly exited as the gpio requests, timer and irq setups are done in the open function, and freed/destroyed in the release function. This is done because exit(1) in the signal handler closes all the open fds and on calling close release function is called. Thus those gpios and irqs are available for user until main is run again.

Running Instructions

1) Connect the circuit (specified below)
2) Insmod usonic.ko
3) Type ./main
4) You may type a command line argument (only type a number) to specify safe distance. If not specified, default safe distance is 5cm.
5) Place a sufficiently large object in front of the sensor and see the bars on the display.
6) The distance value can be seen on the putty screen.
7) To stop type Cntrl + C
8) To run again type ./main

Electrical Connections

1) Connect 5v on board to Vcc on ultrasonic sensor and LED grid. Also similarly connect GND.
2) Connect pin 2 on board to Trigger pin on Ultrasonic sensor module
3) Connect pin 3 on board to Echo pin on Ultrasonic sensor module
4) Connect pin 13 on board to clk on led grid module.
5) Connect pin 11 on board to DIN on led grid module.
6) Connect pin 10 on board to CS on led grid module.