Project Report

EP 315 Microcontroller

SHOOT THE 'RG' : A MOTION SENSING GAMEPAD

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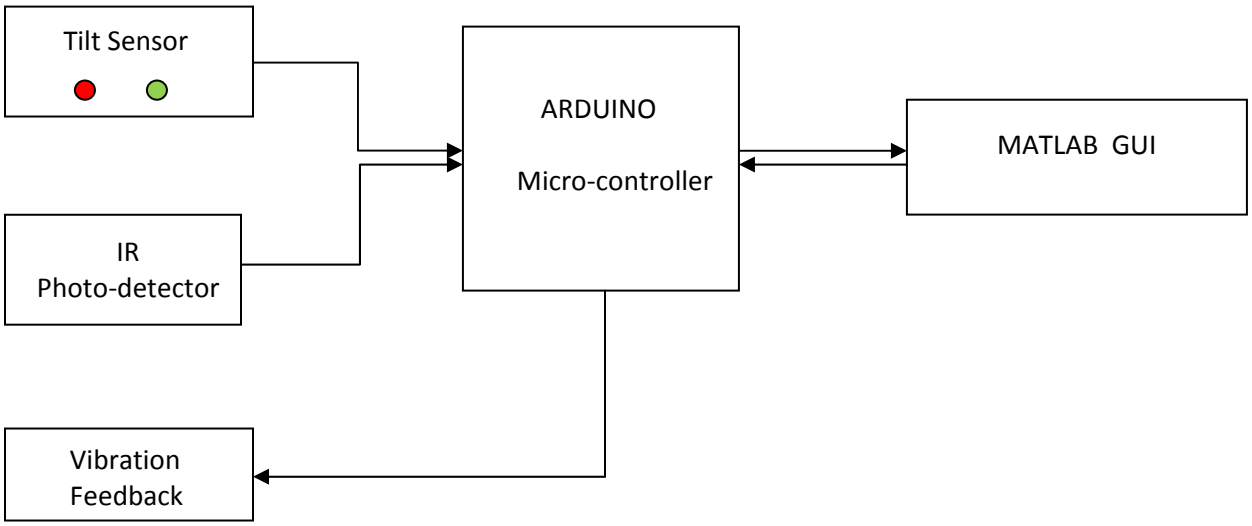
BLOCK DIAGRAM



COMPONENTS USED

Arduino microcoller
Vegakit tilt sensor
IR emitter & detector
Motor (for vibration)

DESCRIPTION

INPUTS AND OUTPUTS

Two sensors were used, a tilt sensor and an IR sensor. The tilt sensor is used for motion and the IR sensor is used to shoot.

The tilt sensor has a cavity with a small conductive free mass inside(a metallic rolling ball). The cavity has a few metallic poles. Depending on the orientation two of the poles are shorted by the ball. This is used to obtain a 2-bit output (4 angular positions).

Three inputs, two from the tilt sensor and one from the IR sensor are given to the Arduino board.

The Arduino board is interfaced with a MATLAb-based GUI through serial communication. A motor with an asymmetric load is used for feedback, i.e, it makes the gamepad vibrate.

ALGORITHM

1. Arduino reads the inputs from the sensors.
2. Arduino finds out the corresponding tilt sate (i.e no tilt or left/right tilt) and the 'shoot-state'.
3. Arduino tells the MATLAB GUI which way to move the crosshair.
4. The GUI plots the cross-hair & target.
5. For an ON shoot-state, Arduino checks if the crosshair lies on the target.
6. If yes, Arduino sends a 'HIGH' output to the vibration-motor and randomizes a new target and the above steps are repeated.
7. Once 10 shoots are reached, Arduino exits and reports the total time taken.

WORK DISTRIBUTION

Praveen - GUI, Hardware research, Arduino code
Abhishek – research on game interfacing(X input), Arduino code, circuitry
Vaideesh - research on game interfacing(D input), Arduino code, circuitry