EMG ARM

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Abstract

The basic idea is to use Electromyography to control the motion of a mechanical arm. This can be extended to a robot that can be controlled from the confines of a safe-house as a substitute for direct human involvement in hazardous situations.

Pre-requisite Knowledge

Signal Processing

Physiology of Human Arm

Fabrication of Mechanical Parts

Structure

The shoulder of the arm is fixed to a wall/vertical support. EMG electrodes sense flexion at the bicep. This input is then amplified and converted to digital and is fed into the arduino. With these readings, we can control the servo, which forms the elbow of the arm.
As an added feature, we're thinking of using flex sensors to implement a similar motion for fingers and the wrist.

Timeline

Week 1: Procurement of parts, read up on signal processing and start building circuit

Week 2: Begin work on the arms and EMG electrodes

Week 3: Completion of signal processing module and arm.

Week 4: Integration of EMG Circuit and Mechanical arm.

Week 5: Testing and calibration

Week 6: Buffer period

Cost Estimate

Component	Price per piece	No. of pieces	Total cost
TL072	*25*	*4*	*100*
INA106	*850*	*1*	*850*
EMG Cables	*600*	*1(x 3)*	*600*
EMG Electrodes	*10*	*10*	*100*
Capacitors, Resistors, Wires, Diodes	*-*	*-*	*300*
Servo	*2000*	*1*	*2000*
Miscellaneous	*-*	*-*	*2000*

Total **Rs. 5950**