**Tri-Axis Motion Detection using MEMS for Unwired Mouse Navigation System in the Future Generation Machines**

***AIM:***

The aim of this project is to implement hand gesture reorganization system based on accelerometer.

***Description:***

This project is to demonstrate that accelerometers can be used to effectively translate finger and hand gestures into computer interpreted signals. For static gesture recognition the accelerometer data is calibrated and filtered. The accelerometers can measure the magnitude and direction of gravity in addition to movement induced acceleration. In order to calibrate the accelerometers, we rotate the device’s sensitive axis with respect to gravity and use the resultant signal as an absolute measurement.

Integrating a single chip wireless solution with a MEMS accelerometer would yield an autonomous device small enough to apply to the fingernails. Because of their small size and weight. Accelerometers are attached to the fingertips and back of the hand. A wrist controller sends the accelerometer data wirelessly to a computer. Arrows on the hand show the location of accelerometers and their sensitive directions. That the sensitive direction of the accelerometer is in the plane of the hand.

***Applications:***

Easy and fast accessing of mouse on PC

This would be Helpful in Robotic Operations through wireless

***Advantage:***

Very low powerequipments will be used for implementation

***Block Diagram***

***Hand Gesture Sensing unit:***

LCD

POWER SUPPLY

MICRO

CONTROLLER

X DIRECTION

(ACCELERETION)

ACCELEROMETER

ZIGBEE TRANSCEIVER

***Pc Mouse Control Unit:***

PC

MAX 232

MICRO

CONTROLLER

ZIGBEE TRANSCEIVER

POWER SUPPLY

***TECHNOLOGY:***

**MEMS TECHNOLOGY:**

Micro-electromechanical systems (MEMS) are Free scale’s enabling technology for acceleration and pressure sensors. MEMS based sensor products provide an interface that can sense, process or control the surrounding environment. MEMS-based sensors are a class of devices that builds very small electrical and mechanical components on a single chip. MEMS-based sensors are a crucial component in automotive electronics, medical equipment, hard disk drives, computer peripherals, wireless devices and smart portable electronics such as cell phones and PDAs.

MEMS technology provides the following advantages: cost-efficiency, low power, miniaturization, high performance, and integration. Functionality can be integrated on the same silicon or in the same package, which reduces the component count. This contributes to overall cost savings.

***HARDWARE & SOFTWARE REQUIREMENTS:***

* **Hardware components**: PIC 16F877A, LCD, RF TX & Rx, MEMS Accelerometer.
* **Software tools**: Development tool – MPLAB v7.42, Hardware Compiler - HI-Tech PIC C, Programmer - PIC Flash, Hardware Simulation tool - Proteus v7.6Sp0