The Wireless Inertial Sensor is a promising technology to detect and measure acceleration, tilt, shock, vibration, rotation and multiple degrees of motion. Historically, inertial sensors, in the form of precision mechanical gyroscopes and accelerometers, were relegated for use in aerospace applications, where their high performance was needed. But as time has progressed, they have followed a corollary of Moore’s law as they have progressively decreased in size, cost and often power. A designer can now implement a sensor that was once restricted to heavy platforms, such as satellites onto the form of a public product, which everyone can use in daily life.

In this Final Year Project we aim to design a Wireless accelerometer-based pointing device. The specific pointing device should be able to sense translational and angular displacement of the pointing direction in space and transmit instructions wirelessly to the computer projecting on a screen. However, to construct the whole pointing device requires a combination of many other technologies and therefore modifications of circuits need to be specially designed to achieve the resultant product. The final device will be able to sense the movement of a user’s hand and use it to control the movement of a mouse on the screen with additional mouse click functions.

### Methodology

#### Accelerometer

The accelerometer can measure acceleration on a maximum of 3-axis where internally it consist of capacitive plates.

**Sensing Detection**
1. Original Accelerometer signal.
2. X and Y signal to the Arduino MCU.
3. Obtain real-time movement digitally.

#### Buttons

Use of three Push button switches in a Pull-Up Resistor network to achieve three button functions.
- Left Click
- Right Click
- Scroll Click

#### Bluetooth RN-42

- Enables Wireless Communication
- Bluetooth profile configuration.
- Human Interface Device
- Keyboard
- Joystick
- Mouse

### Aims and Objective

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### Hardware

#### [1] Basic Hardware Testing Phase

#### [2] Component soldering

#### [3] Hardware inside view

### Result

#### [4] Software calibration & testing

### Software

#### [5] X & Y & Z Output values

#### [6] Final Product