

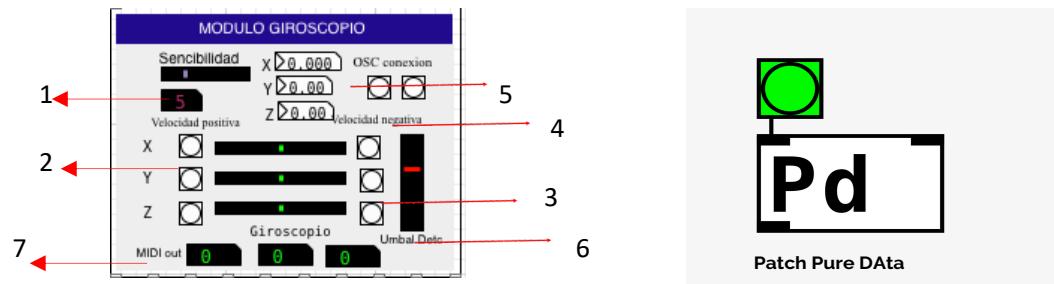
Patch Pure DAta

ACCELEROMETER ACC MODULE

Diseño y desarrollo de sistemas MMHCI híbridos con bioseñales y un DMI de smartphones, para obras bio-interactivas mixtas y performáticas

Pure Data Patches for the PhD Thesis: Juan Pablo posada Alvarez





- Window Adjustment for Filters (Media Filter):** Adjusting the filter window, specifically the moving average filter, involves modifying values that impact the flow of the signal with noise. Reduced values allow for full signal flow, while high values increase data stability by reducing noise. However, it is important to note that increased noise reduction may result in an increase in device response latency in the system.
- Three-Axis Negative Rotational Speed Threshold Detection Display:** The gyroscope module is programmed to interact with the rotational speed, incorporating a specific display to detect high negative rotational speeds on all three axes. Three triggers are designed for each axis with maximum thresholds in the negative direction, and each of these triggers has an individual output for specific connections.
- Threshold Detection Display Positive Rotational Speed on All Three Axes:** Similar to the previous case, the gyroscope module is programmed to interact with the rotational speed, but in this case it focuses on detecting high positive rotational speeds on all three axes. As before, three triggers are designed for each axis with maximum thresholds in the positive direction, and each of them has an individual output for specific connections.
- Spin App Connect Button:** A dedicated button is implemented to make it easier to connect to the Spin App in Processing.
- Gyroscope Rotational Speed Data (Rad/sec):** The module provides accurate rotational speed data in radians per second, obtained from the gyroscope.

6. **Detection Threshold:** The Detection Threshold Slider provides the ability to adjust detection thresholds to suit specific device conditions and user preferences. By increasing this value, faster and more energetic movement is required for it to be detected by the system. In contrast, by adjusting the slider to positions corresponding to lower values, the system is set to activate the triggers even with a reduced movement speed of the device.
7. **MIDI Data Output:** The three values associated with MIDI data output allow visualization of results in a range from 0 to 127 for each of the three axes of rotation. Initially, the module presents these values absolutely, expressed only in positive terms. This implies that no distinction is made between negative or positive rotation for each axis, thus simplifying the interpretation of the output data.
8. **Activation Button for the Connection with the Processing Application:** A specific button is incorporated that facilitates the activation of the connection with the application developed in Processing

This module has the ability to obtain the following features:

Event Triggers by Movement Speed: Six independent event triggers are integrated by rotation speed of the Smartphone, distributed on each axis in a positive and negative direction. Depending on the speed of the movement, three event triggers are activated per rotation on each of the axes. It is important to note that the combination of two axes is allowed for intermediate movements between them, generating 4 more modes of interaction.

The module is connected as follows:

- **Inlet:** Input for OSC module
- **Outlets 1, 2 and 3:** Output values between 0 and 127 for MIDI control of the Smartphone's rotation speed data
- **Outlets 4, 5 and 6:** Provide 3 bang detection respectively per maximum negative rotation speed set at the detection threshold
- **Outlets 7, 8, 9:** Provide 3 detection bangs respectively per maximum positive rotation speed set at the detection threshold