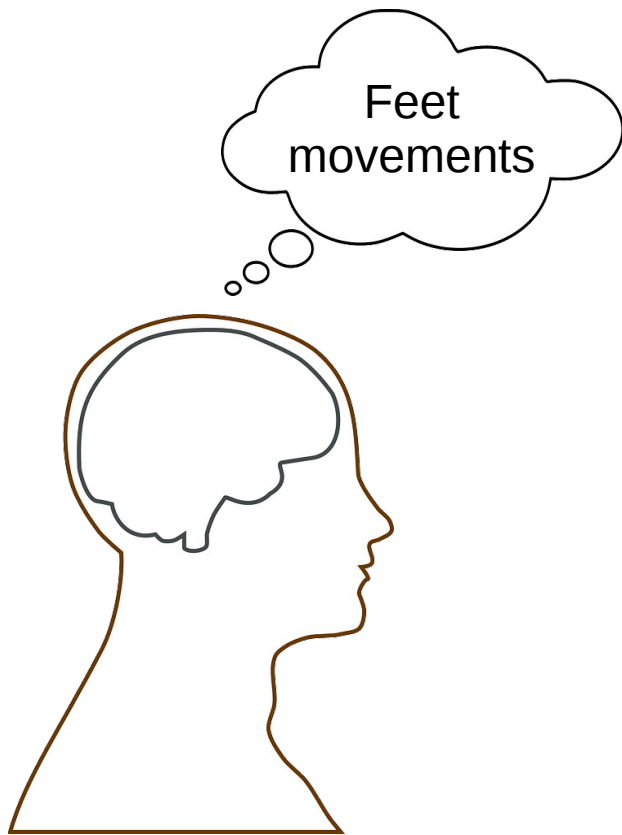


# Use the Force

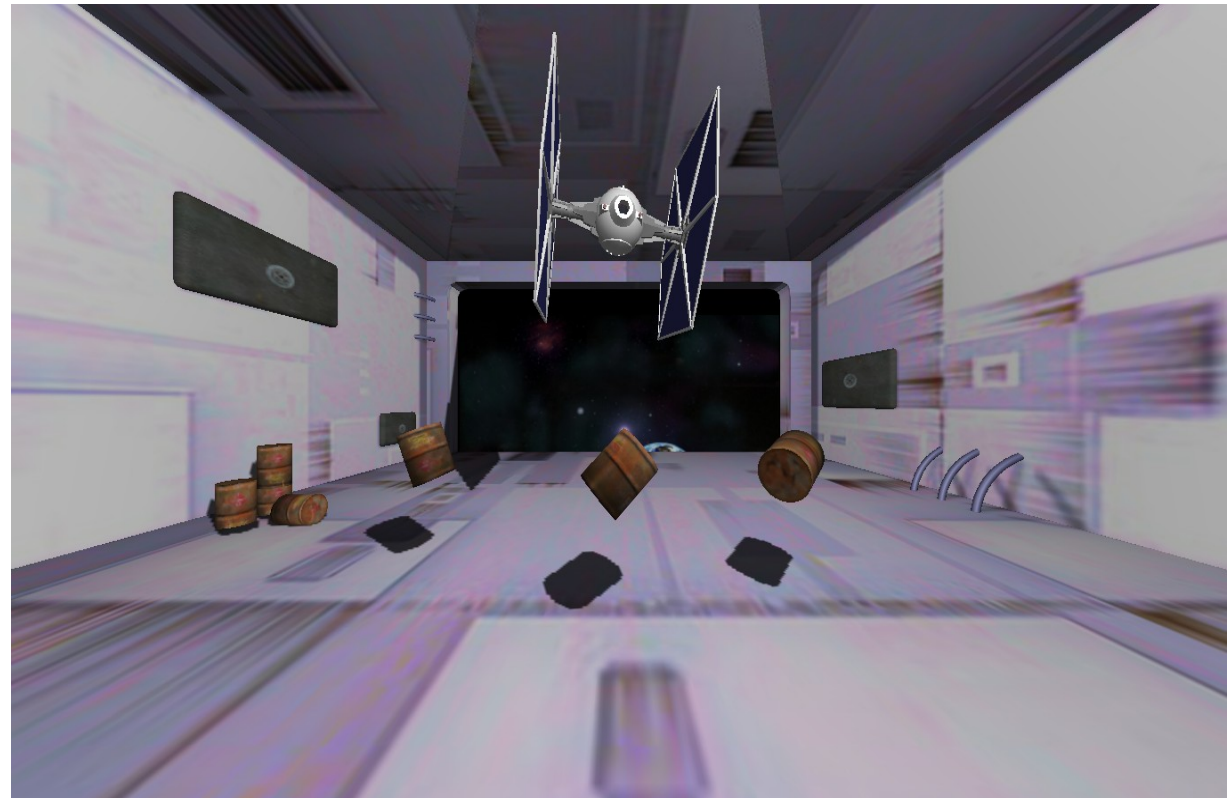
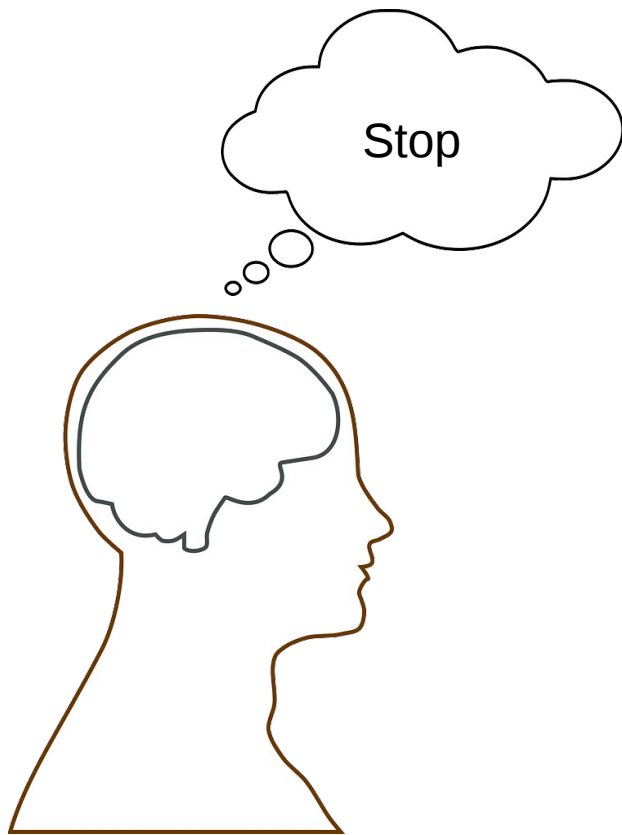
Use foot motor imagery to lift a Tie-Fighter



# Principle

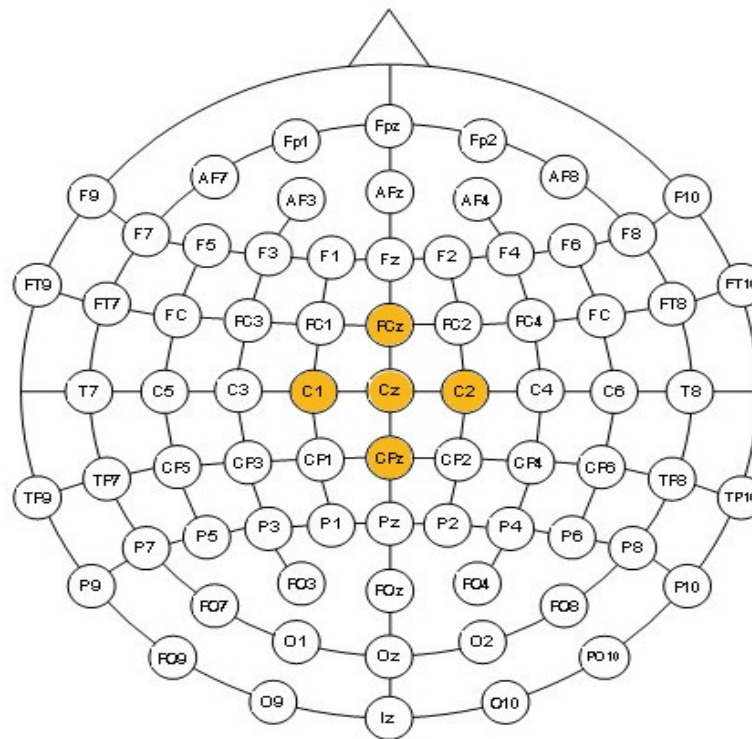


# Principle



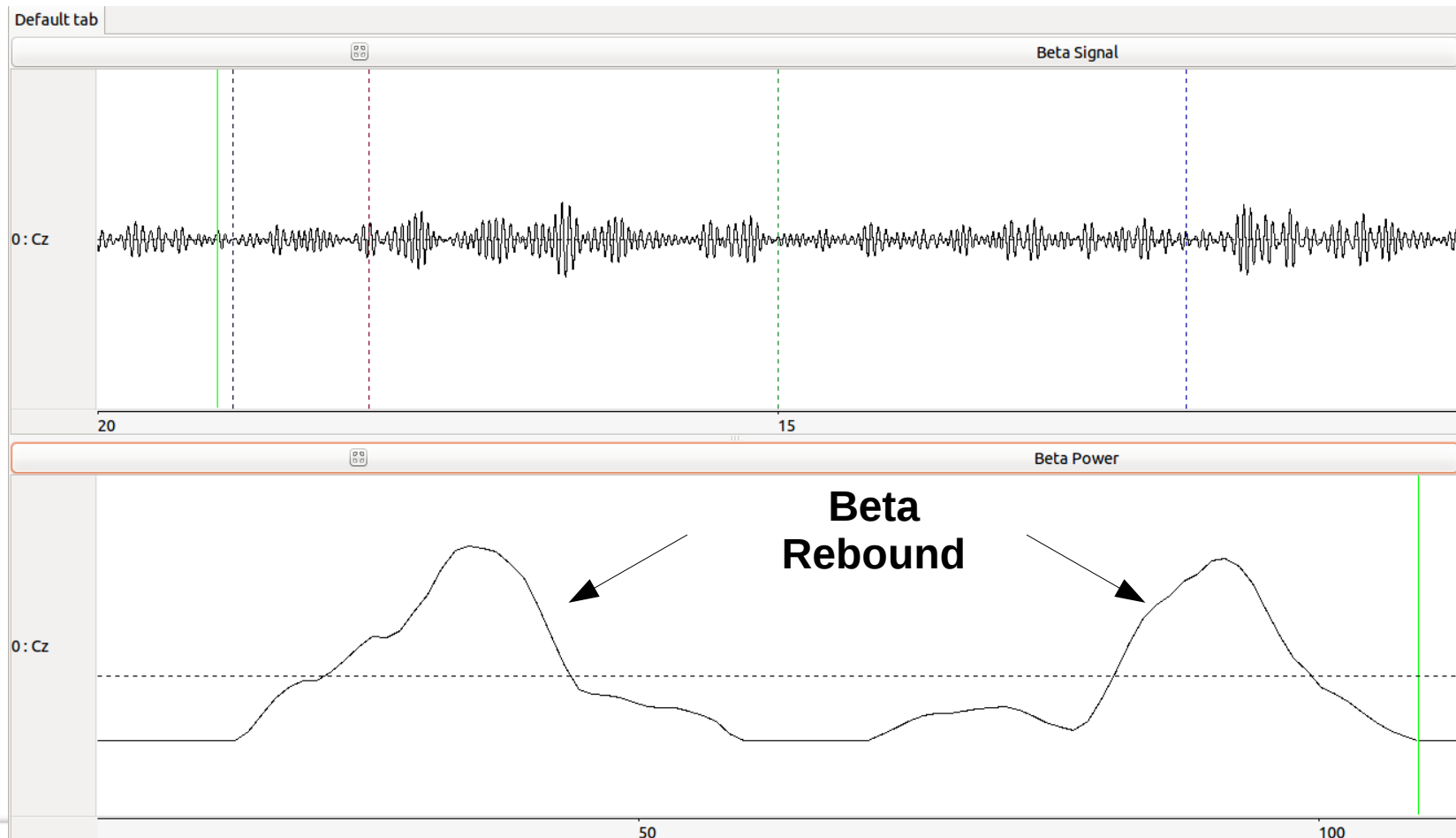
# Feet motor imagery

- Motor activity - Beta frequency band : 16-24 Hz
- Electrodes : FCz, C1, Cz, C2, CPz



# Post Movement Beta Rebound

- Increase of power in the beta band following an imagined (or real) movement



# Calibration phase

- Relaxation during 30 second to estimate threshold



# Calibration phase

- Scenario : `threshold_movement_calibration.xml`

## Overview

This scenario calculate the threshold used for Beta rebound detection in *Use-the-force* application.

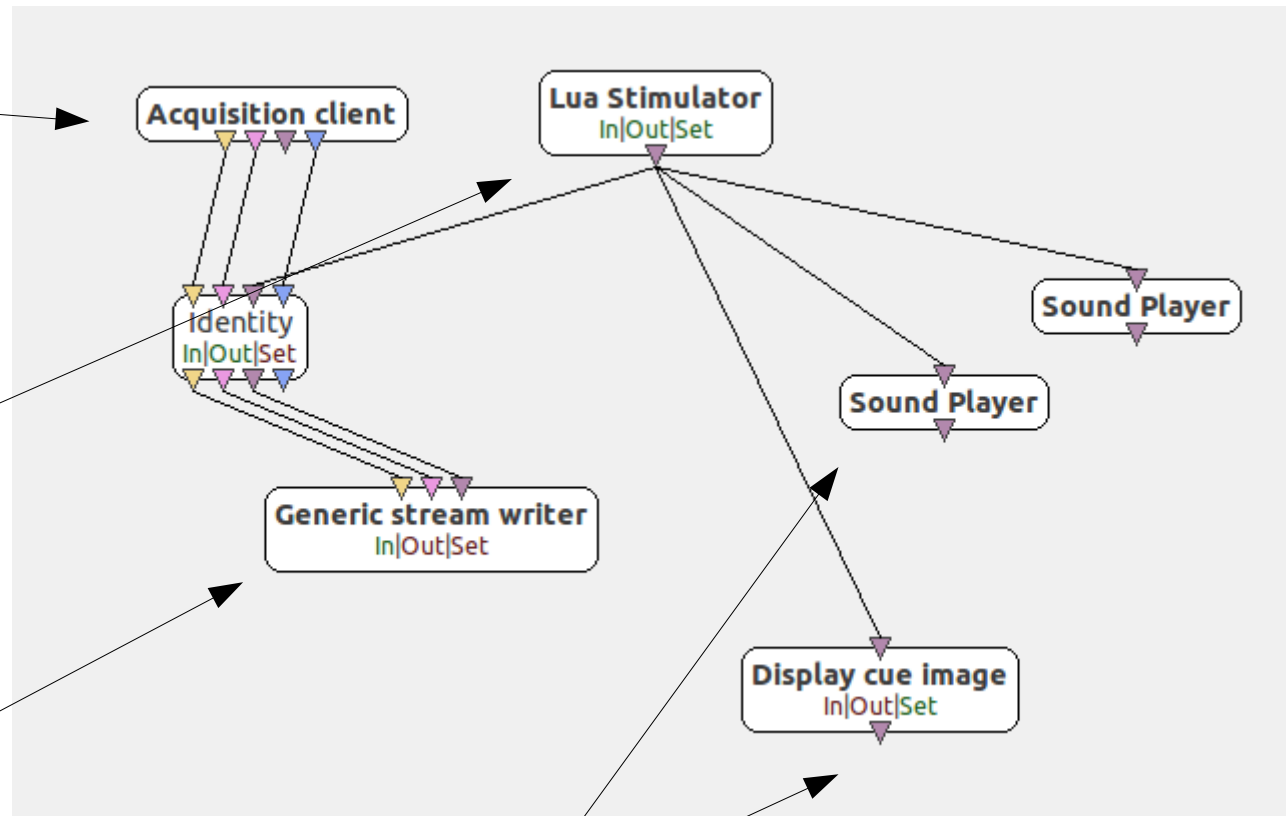
Compute the **Mean** and **Variance** of the Beta activity during 30sec of inactivity.

# Acquisition

Get eeg data from acquisition server

Send stimulation

Record eeg signal in .ov a file



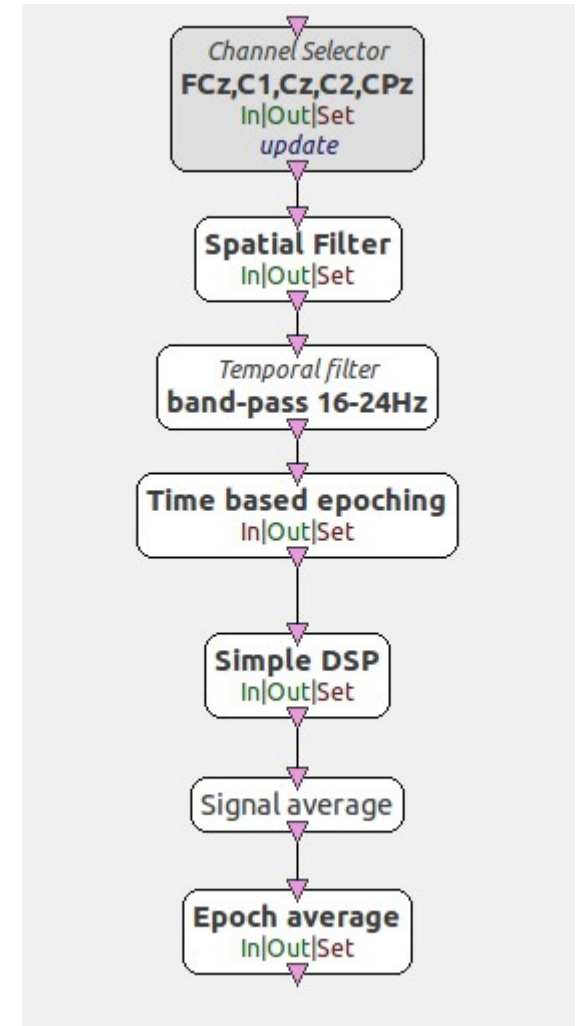
Display stimulation



# Signal processing chain

Laplacian filter  
Temporal filter to select beta  
frequency band

Power band computation



# Application

- Scenario : Use-the-force-online\_5chanLaplacianCz\_self-paced-session.xml

## Overview

This scenario allows to run an online *self-paced* session of **feet motor imagery**. No instructions are presented to the user.

The feedback is presented through signal displays : one for the brain activity on the Cz electrode, and one for the band power in the beta activity, related to (imagined) feet movement.

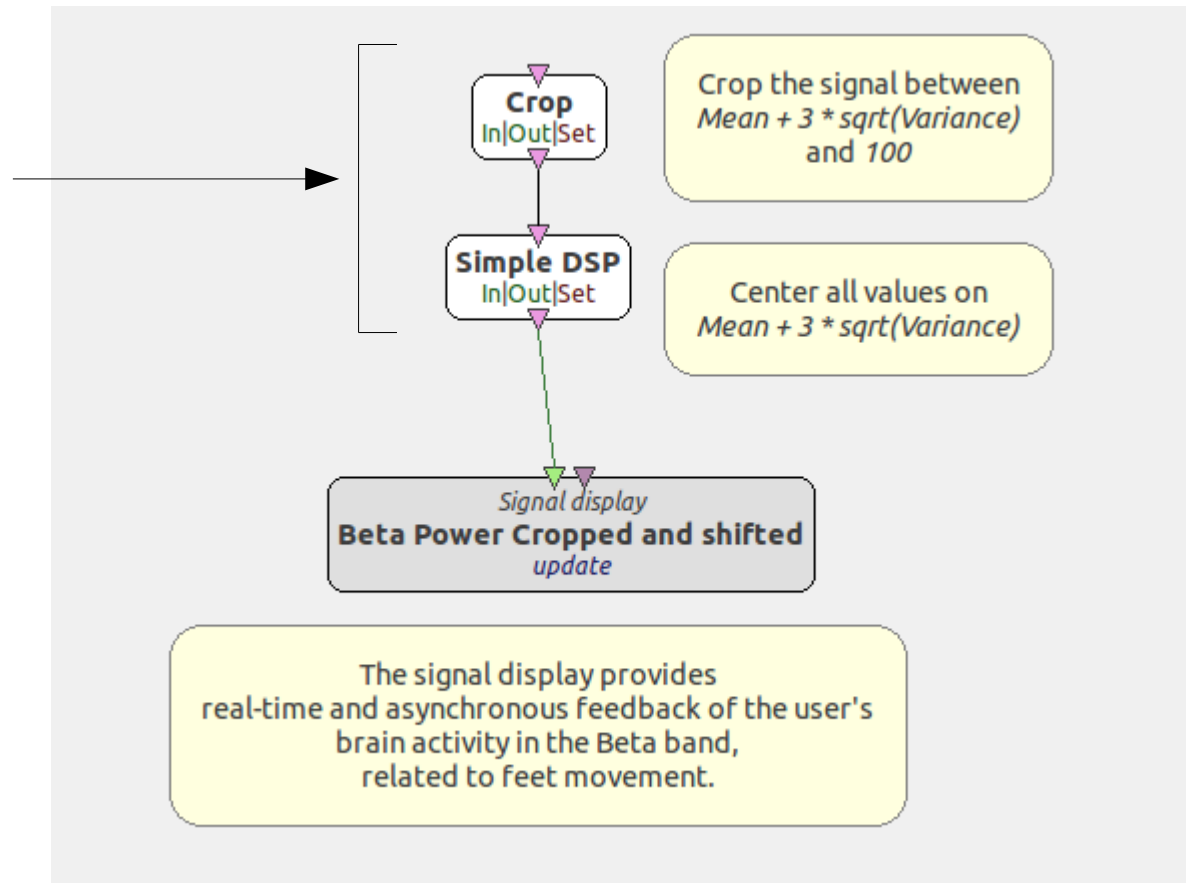
An external feedback is possible through VRPN: launch the **vr-demo-tie-fighter** to see a spaceship lifted when a spike of Beta activity is detected.

For more information on the processing pipeline, please look at the scenario *neurofeedback/neurofeedback.xml*.

- External app : `openvibe-vr-demo-tie-fighter.cmd`

# Thresholding

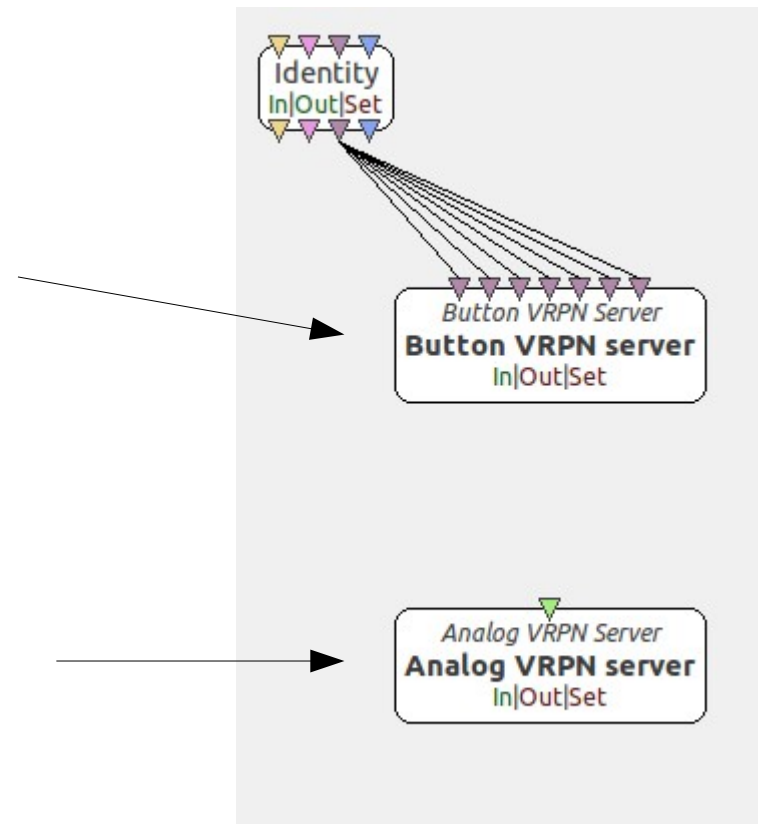
Thresholding



# Communicate with external application : VRPN connection

The button server send the stimulations to the application

The analog server provides the feedback value





May the Force be with you, young Padawan