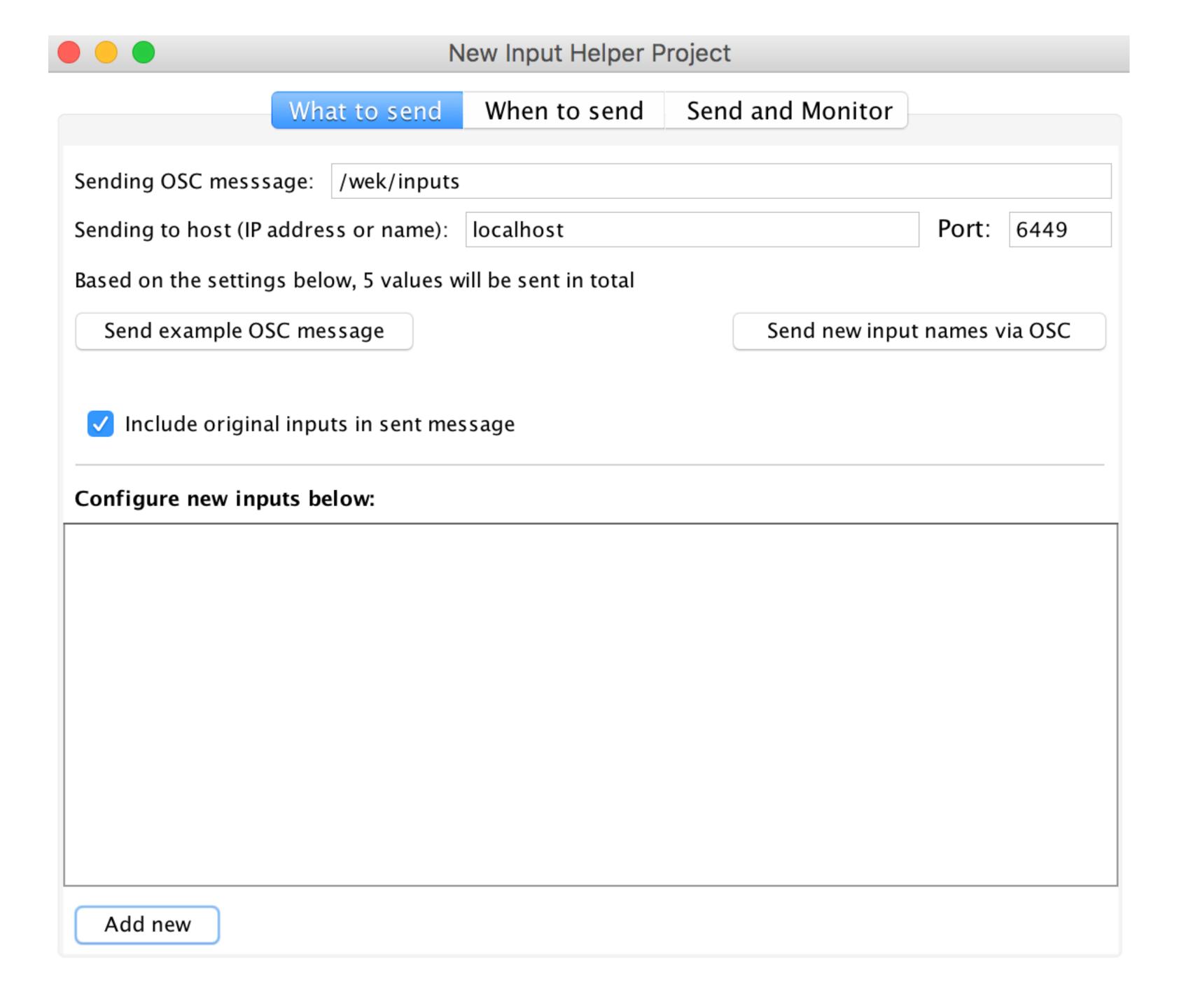
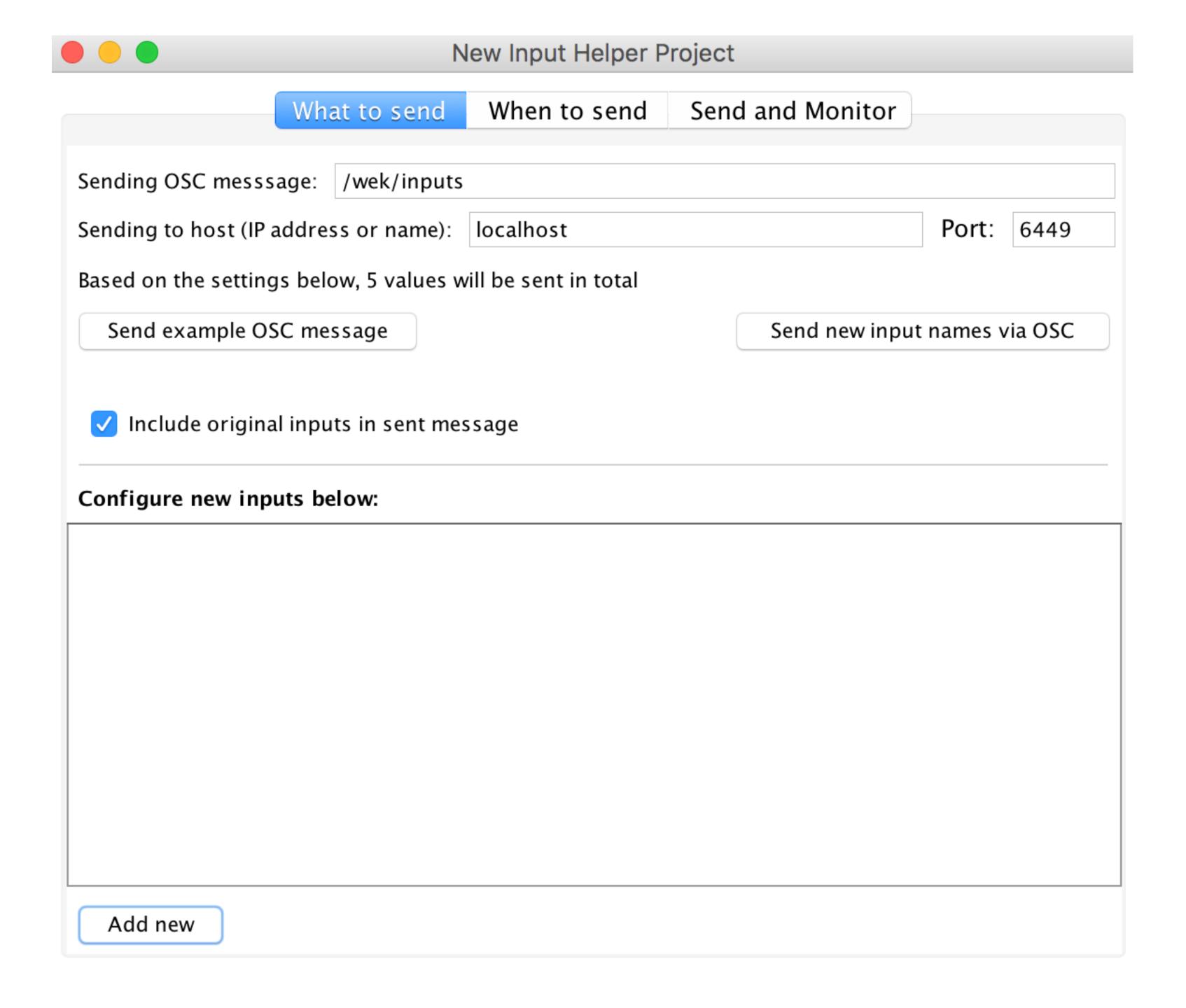
A feature is a measurement of some phenomenon represented by a number.

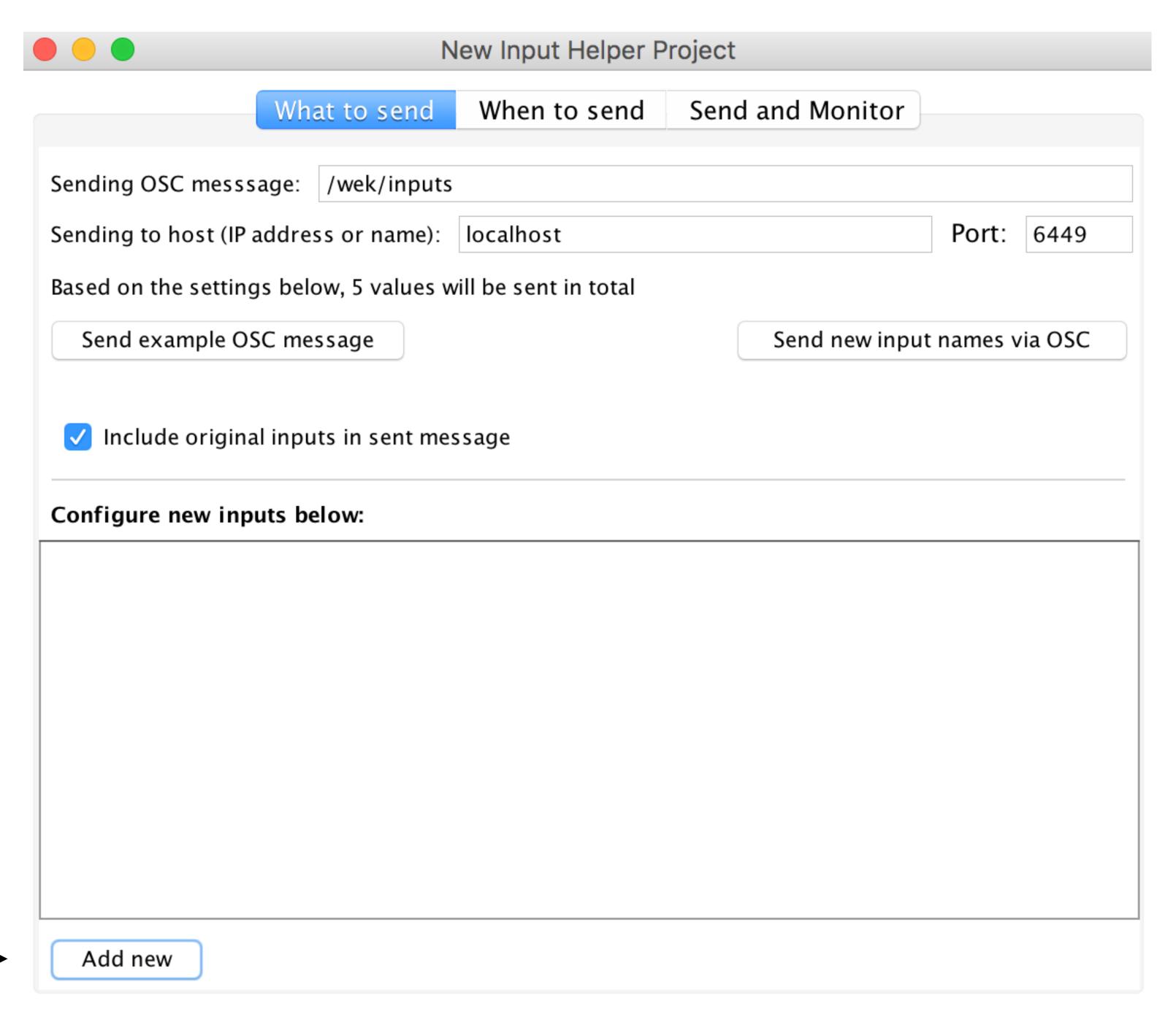
- Only use relevant features
- Have as little as noise possible
- Don't use too many features
 - (more features mean more training time)
- Features should provide enough info though

Use WekiInputHelper (http://www.wekinator.org/input-helper/) to manipulate inputs in different ways.



WekiInputHelper sits inbetween your input and Wekinator. It will receive on port 6448, and send out to port 6449. You have to change Wekinator to listen to port 6449, instead of the default 6448.





Click Add new to start ——

New Input Helper Project What to send Send and Monitor When to send Sending OSC messsage: /wek/inputs Port: 6449 Sending to host (IP address or name): localhost Based on the settings below, 15 values will be sent in total Send example OSC message Send new input names via OSC Include original inputs in sent message Configure new inputs below: Buffer of past values × Minimum over window Maximum over window Minimum first-order ("velocity") over window Maximum first-order ("velocity") over window Minimum second-order ("acceleration") over window Maximum second-order ("acceleration") over window Buffer of past values satisfying conditions Mathematical expression Add new

Scroll down and choose Mathematical expression

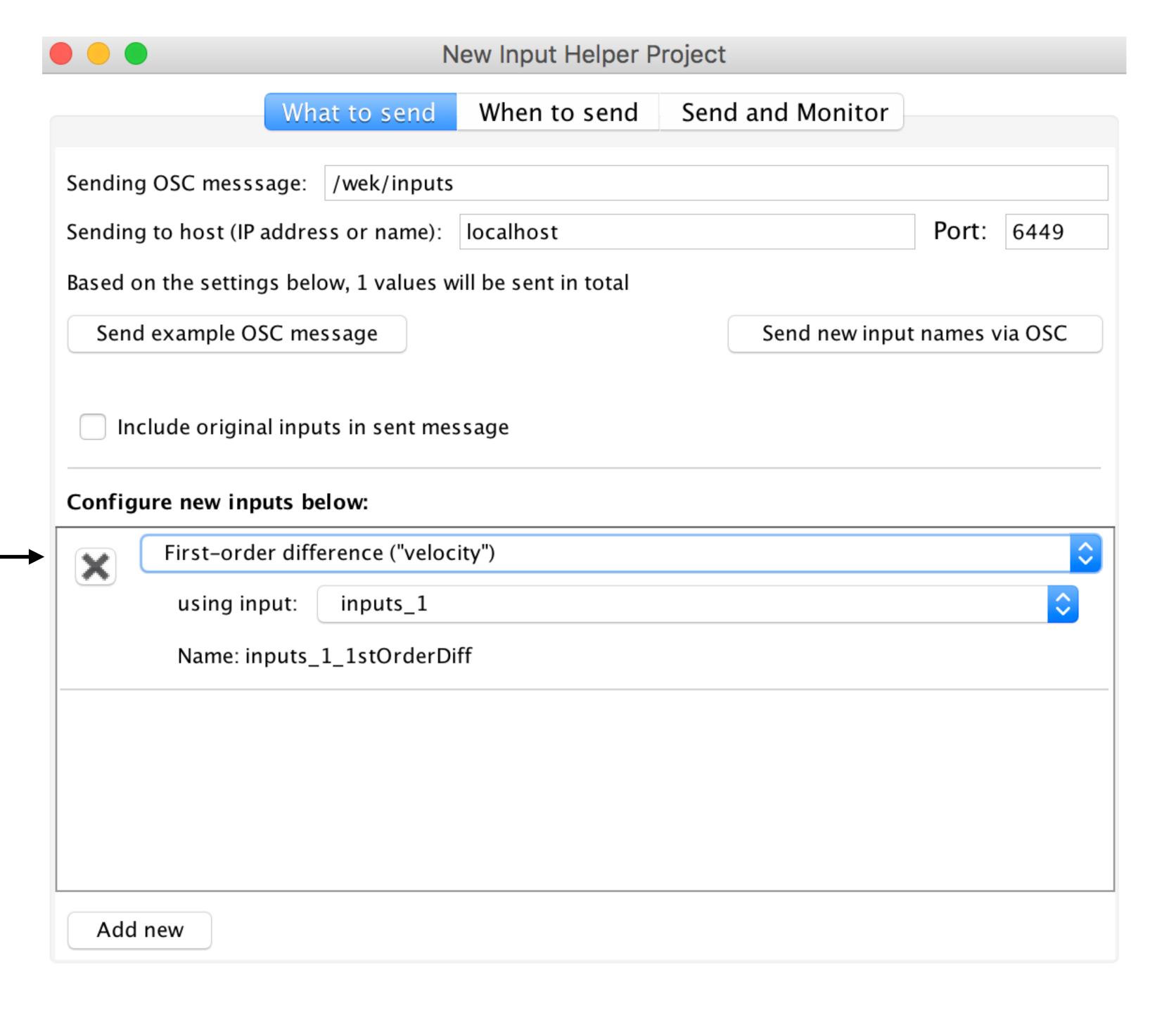
Send and Monitor What to send When to send Sending OSC messsage: /wek/inputs Port: 6449 Sending to host (IP address or name): localhost Based on the settings below, 1 values will be sent in total Send example OSC message Send new input names via OSC Include original inputs in sent message Configure new inputs below: Mathematical expression Enter an expression using any input names: View input names inputs_1-inputs_3 e.g., inputs_1 + inputs_2 * inputs_3 See more examples Check expression normalizedX Unique name for this new value: Add new

New Input Helper Project

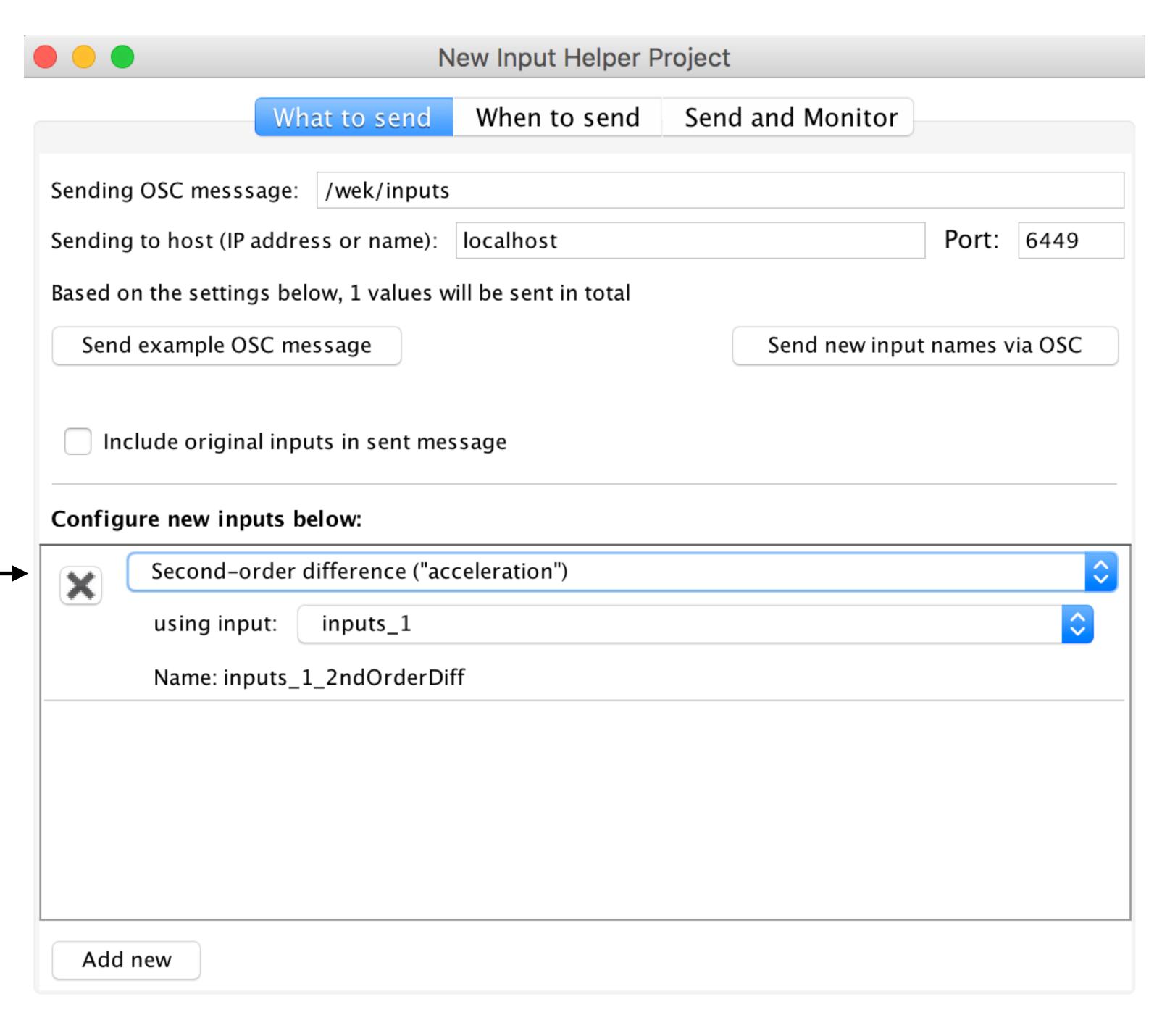
Enter in your equation

You can also custom name the output, which is helpful

First-order difference is velocity, which could be though of as speed or force

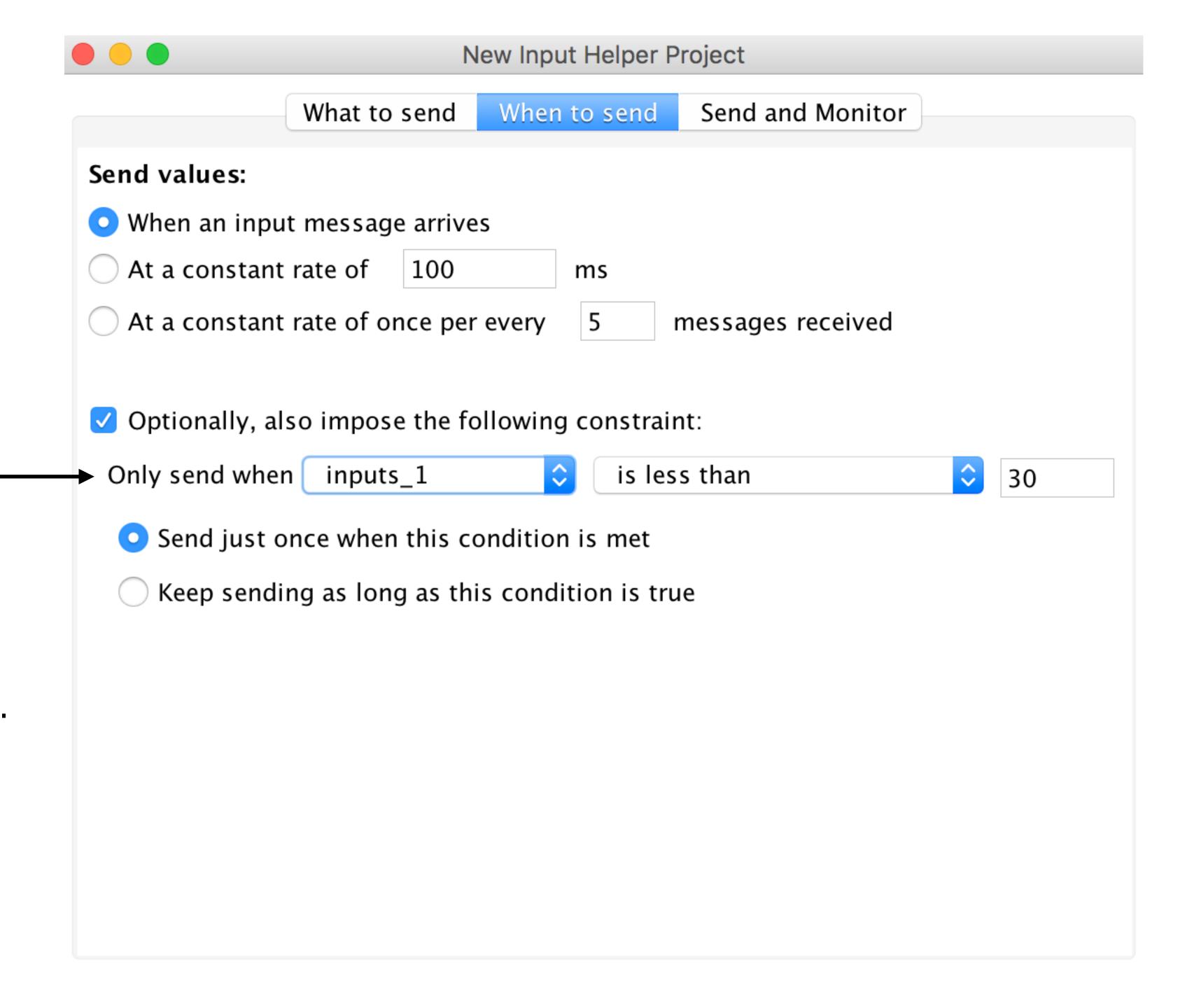


Second-order difference is acceleration, which is a first order difference of velocity. It is actually — the change in velocity and can be used to detect 'strikes' in input data.



If trying to detect a strike, look at your data and find a number that is about where the strike happens.

Then impose a constrain that only once our data goes below that number then output OSC only once.



Audio as input

Various audio input analysis:

http://www.wekinator.org/examples/#Audio

• RMS - Root Mean Square

 $x_{ ext{rms}} = \sqrt{rac{1}{n}\left(x_1^2 + x_2^2 + \cdots + x_n^2
ight)}$

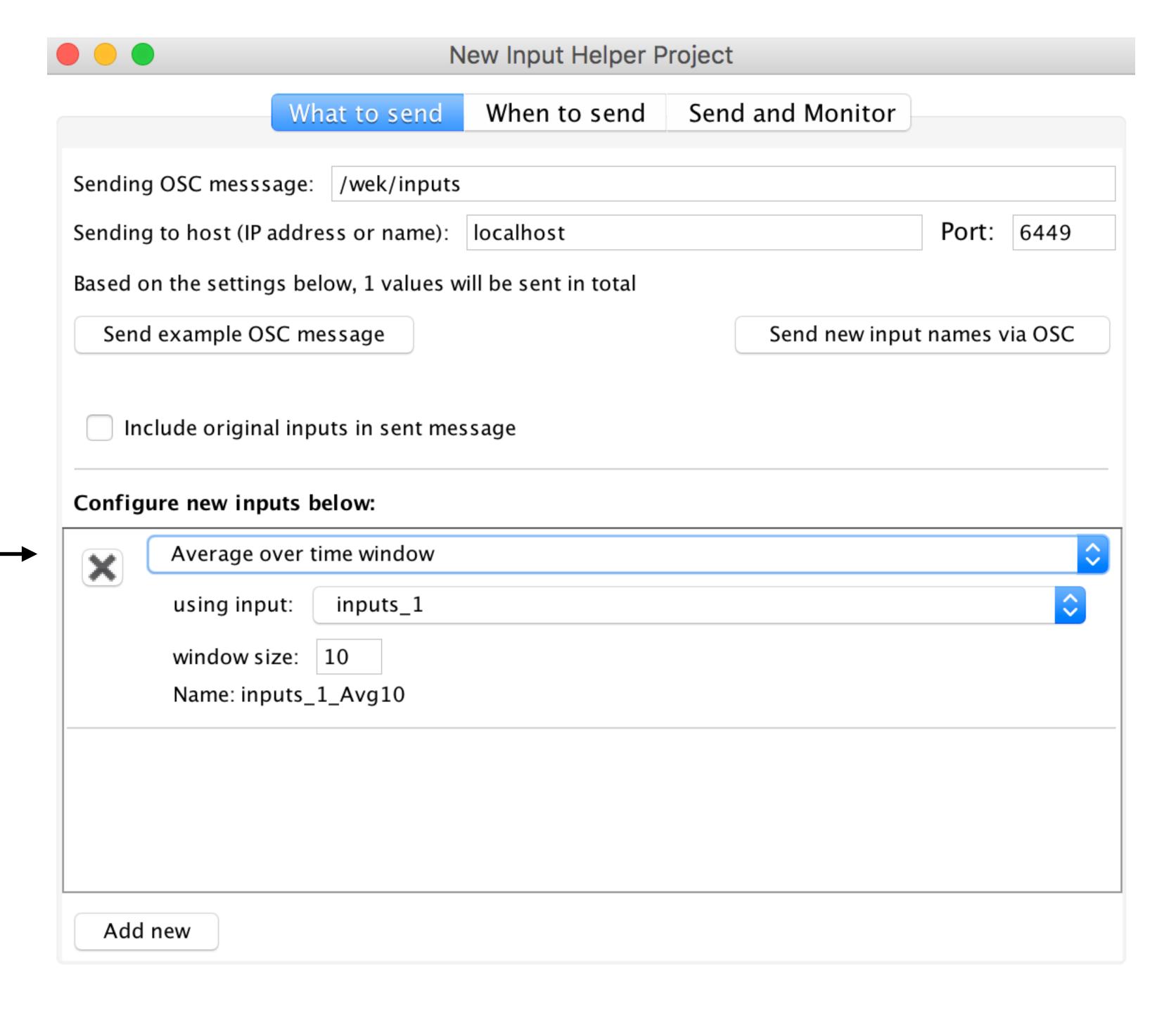
- Good for volume
- FFT Fast Fourier Transform
 - with constrained input sounds could build pitch or timbre classifier
- Peak Frequency (FFT)
 - could give us pitch of a note, or whether voice is male or female
- Spectral Centroid
 - will give us relative brightness of sound, warmer is lower, brighter is higher
 - could give us timbre
- Constant Q Transform
 - Same as FFT but with logarithmic space in-between bins, which is actually how we hear notes
- Mel Frequency Cepstral Coefficients (MFCCs)
 - Swiss army knife, pretty good for anything our than pitch

Smoothing

Get the distance from our current location (smoothed value) to the destination (the input value), scale it down, then add that to out current value:

smoothedValue += (inputValue - smoothedValue) * 0.1

You can take an average over time to smooth noisy signals.



Sending OSC messsage: /wek/inputs Port: 6449 Sending to host (IP address or name): localhost Based on the settings below, 15 values will be sent in total Send example OSC message Send new input names via OSC Include original inputs in sent message Configure new inputs below: Buffer of past values × Minimum over window Maximum over window Minimum first-order ("velocity") over window Maximum first-order ("velocity") over window Minimum second-order ("acceleration") over window You could also enter some Maximum second-order ("acceleration") over window Buffer of past values satisfying conditions signal processing equation Mathematical expression as an expression. Add new

What to send

New Input Helper Project

When to send

Send and Monitor

Video

https://kylemcdonald.github.io/cv-examples/

https://github.com/kylemcdonald/ofxCv

https://github.com/moostrik/ofxFlowTools

Training Tips

- Usually more examples better
- But too much of same doesn't help
- Maybe send features at slow rate if building real time system, so features measurements are different