

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.

New Input Helper Project

What to sendWhen to sendSend and Monitor

Sending OSC message: /wek/inputs

Sending to host (IP address or name): localhost

Port: 6449

Based on the settings below, 5 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:

Add new

WekiInputHelper sits in-between 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.

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What to send

When to send

Send and Monitor

Sending OSC message:

/wek/inputs

Sending to host (IP address or name):

localhost

Port:

6449

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Configure new inputs below:

Add new

Click Add new to start →

New Input Helper Project

What to send When to send Send and Monitor

Sending OSC message: /wek/inputs


Sending to host (IP address or name): localhost Port: 6449

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

New Input Helper Project

What to send When to send Send and Monitor

Sending OSC message:

Sending to host (IP address or name): Port:

Based on the settings below, 1 values will be sent in total

☐ Include original inputs in sent message

Configure new inputs below:

Mathematical expression

×

Enter an expression using any input names:

e.g., $\text{inputs}_1 + \text{inputs}_2 * \text{inputs}_3$

Unique name for this new value:

Enter in your equation

You can also custom name
the output, which is helpful

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



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Configure new inputs below:

	First-order difference ("velocity")	
	using input:	inputs_1
	Name: inputs_1_1stOrderDiff	

Add new

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. →

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Send example OSC message Send new input names via OSC

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Configure new inputs below:

	Second-order difference ("acceleration")	
	using input: inputs_1	
	Name: inputs_1_2ndOrderDiff	

Add new

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.

New Input Helper Project

What to send When to send Send and Monitor

Send values:

☒ When an input message arrives

☐ At a constant rate of ms

☐ At a constant rate of once per every messages received

☒ Optionally, also impose the following constraint:

Only send when is less than

☒ Send just once when this condition is met

☐ Keep sending as long as this condition is true

Audio as input

Various audio input analysis:

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

- RMS - Root Mean Square
 - 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 other than pitch

$$x_{\text{rms}} = \sqrt{\frac{1}{n} (x_1^2 + x_2^2 + \dots + x_n^2)}$$

Smoothing

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

`smoothedValue += (inputValue - smoothedValue) * 0.1`

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



New Input Helper Project

What to send | When to send | Send and Monitor

Sending OSC message:

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Configure new inputs below:

using input:

window size:

Name: inputs_1_Avg10

You could also enter some
signal processing equation
as an expression.

New Input Helper Project

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Configure new inputs below:

☒

Buffer of past values

Minimum over window
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Buffer of past values satisfying conditions
Mathematical expression

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