

A. M. O. S.

ADDITIVE MOTION SYNTHESIS

simulating 2D motion with simple signals

Motivation and concept:

Simple Sine waves have always excited me for some reason.

I use them as building blocks in my creative processes whether it's music synthesis, generative art, video editing (smoothing keyframes) or anything else that needs that "natural" flow or pulse. It wasn't a surprise to see them appear in motion too.

I knew that many kind of motion, like walking cycles (human and animals alike), can be expressed as a collection of simple waves applied to joints.

I was fascinated to see that in action so I built this project for doing just that.

Please consider that this is software I made for myself so I'm sure it could be better in many ways and improved upon.

Usage:

Your test dummy is a simple stickman.

It has 13 Joints, connected to each other as you would expect.

The 14th signal is for controlling the Y position of the figure so you can make it jump or squat etc.

You can decide to make him face Left/Right or Front but don't expect any pseudo-3D.

It's truly only 2D and is not realistic in that sense, or in other sense :-)

Each joint has a dedicated channel strip to control all it's parameters.

This channel strip is a Signal Generator. You can choose from 5 wave variations, and dial in the phase, frequency and the amp of the signal.

The Title bar of each channel allows colouring of that channel, offsetting the Zero angle of this Joint and even copying the channel's parameters to another channel.

There are Global settings like the Speed and Amp that affect all channels and different drawing options. Presets are saved in the ...data/Presets folder and the app comes with three Presets for demo.

I also added a Scope view that visualises the waves, just for that nice look :-)

User Interface:

1 Speed 1.00

2 Amp 0.39

3 Stance

4 Bg GRID WIREFRAME JOINTS ZERO STATE TORSO

5 Width 6 Scale 40 RESET PALETTE

6

7 Reset Cycle

8 Presets from ../data/Presets RUN.TXT

9 ALL SUM

10

Joint	Value	Inv	ph	fr
Head	0.10	Inv	0.0	2.0
Torso	0.20	Inv	-2.0	2.0
Shlder-L	0.70	Inv	0.0	1.0
Shlder-R	0.70	Inv	0.0	1.0
Elbow-L	0.40	Inv	16.0	1.0
Elbow-R	0.40	Inv	16.0	1.0
Wrist-L	0.25	Inv	0.0	1.0
Wrist-R	0.20	Inv	0.0	1.0
Hip-L	0.75	Inv	0.0	1.0
Hip-R	0.75	Inv	0.0	1.0
Knee-L	0.90	Inv	0.0	1.0
Knee-R	0.90	Inv	16.0	1.0
Foot-L	0.55	Inv	0.0	2.0
Foot-R	0.55	Inv	0.0	2.0
Y Axis	0.50	Inv	0.0	2.0

1. Global speed affecting all signals.
2. Global amp affecting all signals.
3. Direction in which the figure is facing.
4. Background color.
5. Width of lines and scale of figure.
6. Checkbox of viewing optins
7. Pause the animation or Reset the Cycles of all waves.
8. Load Presets from data/Presets folder in the sketch's folder.
9. Visualization of all the signals. Toggle between viewing the Sum wave or the seperated signals.
10. 15 identical channel strips. Each channel contains the following features:
 - a. click on the **Waveform** to cycle between the 5 options.
 - b. set **Phase** of the signal. Use this to controll delay times between signals.
 - c. set **Frequency** of the signal. Values are from 0.5–4.0 with 0.5 increments.
 - d. **Amp** slider.
 - e. click on the name of the channel to assign it a custom **Color**, This will also be that body part's color.
 - f. click the small arrow icon on the right of the title bar to offset the “resting” position of each Joint.

This can also be done by hovering over that Joint on the canvas and using click–drag.
 - g. use the copy icon on the left of the title bar to copy this channel's parameters to another.

Just click on the icon and drag the line to the destination channel and release.
11. Save the current settings for all channels as a file that can be read by A.M.O.S
12. Clear and resetto default.