RealSimPLE:

Pipes



The Tube - Teacher's Guide

RealSimPLE lives on the web:

For high school: in Swedish and English <u>http://www.speech.kth.se/realsimple</u>

For college and university, in English: <u>http://ccrma.stanford.edu/realsimple</u>

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Kungliga Tekniska Högskolan; School of Computer Science and Communication; Department of Speech, Music and Hearing. <u>www.speech.kth.se</u>



Stanford University, California, USA - Department of Music, Center for Computer Research in Music and Acoustics (CCRMA). <u>http://ccrma.stanford.edu</u>



House of Science, KTH Albanova, www.houseofscience.se

RealSimPLE 2007

Contents

Setup	4
System requirements	4
Installation instructions	4
Connecting the devices	4
Starting up	4
Software Overview	5
1. Tone Generators	5
2. Oscilloscope	7
3. Spectroscope	7
4. External devices on/off	7
5. Start/stop	7
Troubleshooting	8
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Setup

System requirements, minimum

Processor:600Mhz Pentium III Athlon, or equivivalentRAM:256MBSoundcard:Windows compatible

Installation instructions

Download the patch Pipe.pd from the RealSimPLE website and save it to c:\RealSimPLE.

Connecting the devices

Connect the mini jack from the microphone to the pink microphone input connector on the sound card. Connect the mini jack to the loudspeaker to the green line output connector on the sound card.

Starting up

Start PD (PureData) from Start Menu \rightarrow Programs \rightarrow Pure Data. In PD, open the patch Pipe.pd by choosing File \rightarrow Open.

When the patch is first opened, it shows only the oscilloscope and only the first oscillator.

Software Overview



1. Tone Generators

Oscillators 1-4*

By choosing different red check boxes labeled 1-4* you can choose to hide oscillators that are not currently being used. All oscillators generate sine waves with the frequency and amplitude that are set in their respective fields. Oscillator 4 also has a sweep function that allows it to sweep between two user defined frequencies during a specified time.

Flutifier

The Flutifier is a flute simulator based on additive synthesis. Flutifier sums all the oscillator signals and adds two more whose frequencies are determined by the difference between oscillators 3 and 4. Noise, which is bandpass filtered to amplify the noise at the frequencies of

the six oscillators, is then added. The sum of the oscillators and the sum of the filtered noise are separately run through ADSR envelopes¹.



Here is a block schematic on the design of Flutifier.



¹ ADSR (Attack – Decay – Sustain - Release), is the conventional abbreviation for an envelope time function with four straight segments. It is a common way to control how a tone changes in time. Here, the ADSR envelope is only applied to the volume of the synthesized sound.

2. Oscilloscope

Autotrig is a trigger function that automatically adjusts so according to the phase of the incoming signal, so that the signal viewed in the oscilloscope always starts at zero amplitude and with a negative slope. Use the zoom to magnify the wave form and press the RMS button to display the current input level.

3. Spectroscope

Click the bottom red button in the Views-field to display the spectroscope. Click the Frequency button to display an estimate of the current first resonance frequency. The Store_Freq button will store resonance peaks during a frequency sweep.

4. External devices on/off

Here the microphone and loudspeaker are activated.

5. Start/stop

Here PD's audio is turned on or off.

Troubleshooting

• The signal in the display is clipped or distorted.

The signal from the microphone is amplified too much by the amplifier at the microphone input. Use Volume Control which is found at Start Menu -> Programs -> Accessories -> Entertainment and set the microphone level slider to a lower level.

• The signal in the display moves very little or not at all.

The signal from the microphone is not amplified enough by the amplifier at the microphone input. Use Volume Control which is found at Start Menu -> Programs -> Accessories -> Entertainment and set the microphone level slider to a higher level.