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Teaching Tuning Theory with SuperCollider 3

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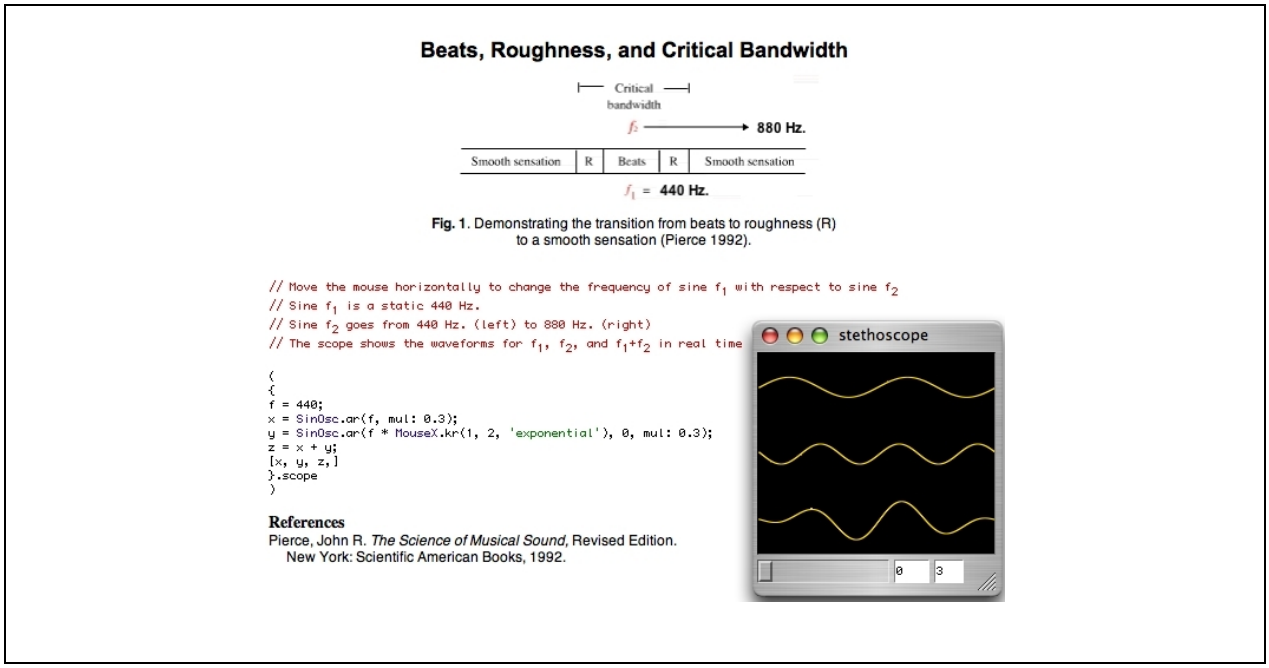
Abstract

SuperCollider 3 (SC3) is a real-time audio synthesis programming language and environment for algorithmic composition by James McCartney. A former Mac-only commercial product, it is now being developed by the open source community under a GNU General Public License for Mac OS X, Linux, and Windows. This paper presentation will introduce the SC3 application using code examples that demonstrate how to create simple tuning theory applications. The applications are distributed as Rich Text Format (.rtf) files that, when loaded into SC3, merge formatted explanatory text, image, and audio synthesis code. Highlight the code, press the 'enter' key, and SC3 renders the audio, which may be manipulated in real-time by the user.

A website for this presentation is available at:

www.music.sc.edu/fs/bain/atmi07/

Figure 1. A simple interactive tuning application built with SuperCollider 3 that allows the user to explore the concepts of *beats*, *roughness*, and *critical bandwidth*.



About SuperCollider 3

SuperCollider 3 (SC3) is an interpreted, object-oriented programming language for audio synthesis and algorithmic composition that is based on Smalltalk. Its unique client-server architecture and OpenSound Control (OSC) implementation make it an ideal tool for interactive real-time composition and performance. SC3's amazingly efficient and elegant (C-programming language style) syntax makes the design of complex audio signal networks and algorithmic compositional processes a breeze. Its built-in signal display, mouse, keyboard, MIDI and audio interaction objects make it an ideal tool for the investigation of the basic properties of sound. A powerful synthesis engine with over 250 built-in unit generators, it can be used to implement nearly any type of synthesis including additive, subtractive, AM, FM, wave-table, and physical modeling. SC3 has an integrated text editor that provides convenient access to interactive help documents and source code. Code is edited and stored in Rich Text Format (.rtf) files. Highlight the code, press the 'enter' key, and SC3 renders the audio, which may also be manipulated in real-time by the user.

References

Bain, Reginald. 2004. *Designing Computer-Assisted Instruction Software for Music Theory with Max/MSP*. Association for Technology in Music Instruction (ATMI) 2004 national conference, paper presentation. San Francisco, CA.

_____. 2002. *A Web-based Multimedia Approach to the Harmonic Series*. Association for Technology in Music Instruction (ATMI) 2002 national conference, paper presentation. Kansas City, MO.

Collins, Nick. Workshop Materials for G6002 Computational Music 1 at the University of Sussex. Available online at: <http://www.informatics.sussex.ac.uk/users/nc81/courses/cm1/workshop.html>. *Link no longer available.*

Cottle, David Michael. 2005. *Computer Music with Examples in SuperCollider 3*. *Available online at: <https://supercollider.github.io/tutorials/>*.

Pierce, John R. 1992. *The Science of Musical Sound,* Revised Edition. New York: Scientific American Books.

Links

McCartney's SuperCollider Website – http://www.audiosynth.com

Download SuperCollider – http://supercollider.sourceforge.net
(*Automatically forwards to https://supercollider.github.io/*)