

CALL FOR PAPERS

Special Issue on Virtual Analog Audio Effects and Musical Instruments for the IEEE Transactions on Audio, Speech and Language Processing

This is a call for papers for a special issue on Virtual Analog Audio Effects and Musical Instruments to be published in 2010 in the IEEE Transactions on Audio, Speech and Language Processing.

The topic of this special issue is related to the recent trend of digitalization of electronic, electromechanical, electromagnetic, and acoustic systems used in music. There is a need to replace electronic devices used in music technology by software components, which are implemented using digital signal processing methods. The motivation may be to reduce the number of physical devices and connections or error sources, or to imitate the nostalgic sounds of the past, although the old equipment is unavailable. Typical applications of virtual analog audio signal processing are guitar amplifier models and virtual analog music synthesizers. Similarly, a need exists to simulate acoustic musical instruments and replace them with software.

We invite papers describing various aspects of virtual analog signal processing and virtual musical instruments. Submissions must not have been previously published, with the exception that substantial extensions of conference papers will be considered. Specific topics of interest include:

- Modeling of amplifiers and loudspeakers, such as tube-amplifiers for the electric guitar
- Emulation of analog electronic filters, e.g., tone stacks and analog resonant filters
- Virtual analog oscillators for subtractive synthesis, including alias-free oscillator algorithms
- Simulation of analog audio effects, such as delay, echo, phasing, flanging, chorus, and enhancement
- Modeling of historical reverberation methods, such as plate, spring, and tape-based echo units
- Simulation of electromechanical musical instruments and devices, e.g., the Leslie speaker
- Modeling of microphones, guitar pickups, and magnetic heads
- Digital simulation of analog noise-reduction systems and codecs, especially for tape recording and reproduction, e.g., Dolby B/C and DBX
- Audio antiquing: simulation of the sound quality of analog recordings, such as a vinyl LP disk
- Virtual scratching and other signal processing techniques for DJs
- Physical modeling of musical instruments, e.g., guitars, keyboard instruments, or drums
- Methodology for virtual analog and acoustic systems, such as wave digital filters and modeling techniques for nonlinear continuous-time systems
- Parameter estimation and perceptual issues
- Innovative software and hardware implementations

Schedule:

Submission deadline: 15 March 2009

Notification of acceptance: 15 August 2009

Final manuscript due: 15 October 2009

Tentative publication date: March 2010

Guest Editors:

Vesa Välimäki (Helsinki University of Technology, Finland), vesa.valimaki@tkk.fi

Federico Fontana (University of Verona, Italy), federico.fontana@univr.it

Julius O. Smith (Stanford University, USA), jos@ccrma.stanford.edu

Udo Zölzer (Helmut Schmidt University, Germany), udo.zoelzer@hsu-hamburg.de