

3135 L 785: Montags, 10 – 14 Uhr (c.t.)

The Acoustic and Psychoacoustic Basis of Digital Synthesis and Signal Processing

Instructor: Barry Truax

Website: www.sfu.ca/~truax

The study of digital sound synthesis and signal processing can be greatly aided by a knowledge of acoustics and psychoacoustics, and in turn, digital audio research can enhance our understanding of sound and aural cognition. This seminar/lab will survey both historical and contemporary acoustic and psychoacoustic knowledge that relates to digital sound design and signal processing, with reference to both electroacoustic music and soundscape composition.

Topics will include traditional synthesis techniques (such as additive, FM and waveguide synthesis) and contemporary aspects of microsound (such as the frequency-time based approaches of granular synthesis and convolution). Acoustic and psychoacoustic topics will include pitch and timbre perception, loudness and volume, environmental sound propagation and binaural localization, sound-sound interaction, speech acoustics, auditory streaming and scene analysis.

- Oct. 19** Historical (and personal) background re Electroacoustic & Computer Music
Basic digital and digital synthesis theory; vibration and periodicity
- Oct. 26** Spectrum
- Nov. 2** Timbre, pitch and psychoacoustics
- Nov. 9** Non-linear synthesis models (modulation synthesis)
- Nov. 16** Frequency-time models and granular synthesis
- Nov. 23** Magnitude, decibel, loudness and volume
- Nov. 30** Sound-Environment interaction and binaural hearing
- Dec. 7** Sound-Sound interaction and auditory streaming
- Dec. 14** Speech acoustics
Audiology and hearing loss
- Jan. 4 - Feb. 8** Compositional analysis and mentoring of student projects