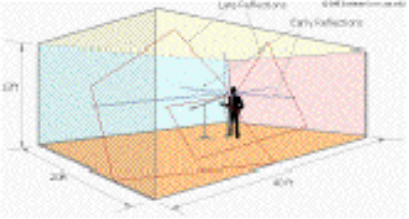


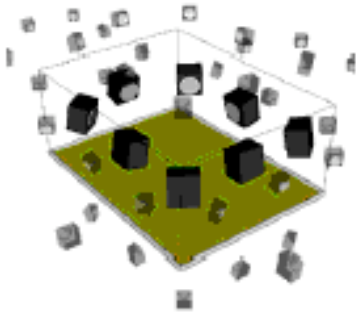
MAT 240C Digital Audio Programming: Spatial and Surround Sound (Spring, 2007)

The MAT 240 sequence is a six-part (two-year) practical programming course; it consists of hands-on software development devoted to digital audio and multimedia applications. Students read a selection of papers from the literature, with the emphasis on learning to use the current state-of-the-art programming methods, tools, and programming interfaces. Class assignments involve C/C++/Java programming on Linux, Macintosh, MS-Windows, various plug-in APIs, and other platforms.



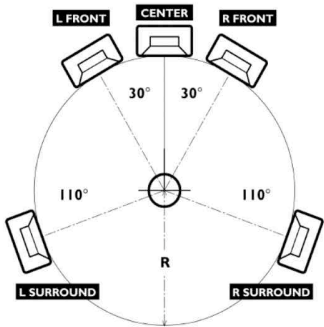
MAT 240C concentrates on the processing of digital audio signals for multi-channel panned or spatialized output. Starting with simple stereophonic models, we investigate the representation of localized sound, reverberation, multi-channel panning, head-related transfer functions, and techniques for producing convincing spatialized sound. We develop and evaluate examples that use several existing surround sound APIs.

Students are expected to know the basics of digital audio signal representation and processing, and to be proficient in C, C++, or Java (Smalltalk, SuperCollider, LISP, and/or XML are a plus). Grading will be on the basis of in-class participation and programming projects.



Course Outline

- Monophonic and stereophonic sound
- Inter-channel panning methods
- Decorrelation and binaural sound
- Sound-in-rooms and reverberation
- Techniques for artificial reverberation
- Standards for multi-channel sound projection
- Simulation of 3D sound localization
- Using head-related transfer function data
- Applications of spatial and surround sound



Instructor

- Stephen T. Pope (stp@mat.ucsb.edu)

Meeting time and place

- T/Th 2:00 - 3:50 PM, Music 2215

Electronic Resources

- Course Web Site
See <http://create.ucsb.edu/240>
- Email Mailing List
See <http://www.mat.ucsb.edu/mailman/listinfo/240> to join

