4:10

2pAA8. Composition and performance as outgrowth of synthesis techniques. Richard Boulanger and Greg Thompson (Berklee College of Music, 150 Massachusetts Ave., Boston, MA 02215)

New methods of controlling and interacting with synthesizers are increasingly available to the composer. Advances in input devices enable a large range of gestural parameters to be translated into musically-relevant data, which can then be used in synthesis environments like Csound and Max/MSP. This paper will examine such input devices, including the radio baton, and show how this technology may be combined with existing synthesis techniques to produce exciting new sounds, algorithms, and compositional works.

Contributed Paper

4:30

2pAA9. Violin acoustic radiation synthesis: A source model for direct sound enhancement in musical acoustic environments. Jacob Waxman and Mark Bocko (Dept. of Elec. and Comput. Eng., Univ. of Rochester, Rochester, NY 14627, jw001j@mail.rochester.edu)

Within the context of immersive acoustic environments (real or virtual) for purposes of musical performance, it is useful to recreate the acoustic field radiated by real musical instruments. Given the popularity of wave field synthesis for direct sound enhancement and other methods of holophonic sound imaging, source modeling is a desirable development for such musical applications. There exist careful directivity measurements of the sound radiation of the violin in the frequency range from 1 to 5 kHz, over which the far field directivity changes rapidly as a function of frequency [L. M. Wang, "Radiation Mechanisms from Bowed Violins," Ph.D. thesis, Pennsylvania State University, 1999]. Source models based on these measurements using a cylindrical harmonic decomposition are presented. With this preliminary approach to violin acoustic radiation modeling, issues regarding further auralization of this synthesized field are subsequently addressed.

TUESDAY AFTERNOON, 16 NOVEMBER 2004 PACIFIC SALON 1, 1:25 TO 5:10 P.M.

Session 2pAB

Animal Bioacoustics: Marine Mammal Acoustics: Session in Honor of Ron Schusterman II

Colleen Reichmuth Kastak, Chair
Long Marine Laboratory, University of California, Santa Cruz, 100 Shaffer Road, Santa Cruz, California 95060

Chair's Introduction—1:25

Invited Papers

1:30

2pAB1. Temporal integration in a California sea lion and a harbor seal: Estimates of aerial auditory sensitivity as a function of signal duration. Marla M. Holt (UC Santa Cruz Long Marine Lab., 100 Shaffer Rd., Santa Cruz, CA 95060), Brandon L. Southall (NOAA Fisheries Acoust. Program, Silver Springs, MD 20910), David Kastak, Ronald J. Schusterman, and Colleen Reichmuth Kastak (UC Santa Cruz Long Marine Lab., Santa Cruz, CA 95060)

Stimulus durations shorter than some critical value result in elevated signal-detection thresholds due to temporal integration (or temporal summation) properties of the auditory system. These properties are important from a theoretical perspective in terms of the trade-offs of stimulus duration and intensity on sensitivity. From a methodological perspective, temporal integration is important because absolute detection thresholds measured using signal durations shorter than the temporal integration period may underestimate hearing sensitivity. In this study, aerial sound-detection thresholds were estimated at 2500 and 3530 Hz in a California sea lion (*Zalophus californianus*) and a harbor seal (*Phoca vitulina*). Thresholds were measured for each frequency at seven stimulus durations ranging from 100 to 500 ms using behavioral psychophysics in a hemianechoic chamber. In general, thresholds increased as tone duration decreased for durations shorter than approximately 300 ms. For tone durations longer than 300 ms, thresholds were not different from those measured with the longest duration tested. These results suggest temporal integration times of approximately 300 ms for these species, which are consistent with data collected on other mammals. Our findings suggest that tone durations longer than 300 ms should be used in estimating pinniped auditory sensitivity.

1:50

2pAB2. Noise-induced temporary threshold shifts in pinnipeds: Effects of noise energy. David Kastak (UCSC Long Marine Lab., 100 Shaffer Rd., Santa Cruz, CA 95060), Brandon Southall (UCSC Long Marine Lab and NOAA Fisheries Acoust. Program, Silver Spring, MD 20910), Marla Holt, Colleen Reichmuth Kastak, and Ronald Schusterman (UCSC Long Marine Lab., Santa Cruz, CA 95060)

Auditory pure-tone thresholds were obtained in air and in water from three pinnipeds before and immediately after exposure to octave-band noise. Noise exposure durations were 1.5, 12, 22, 25, or 50 min, and noise levels were 65, 80, or 95 dB referenced to each subjects pure-tone threshold. In air and in water, pre- and postnoise thresholds were obtained at the center frequency of the octave band. In water, thresholds were also obtained at a frequency octave higher than the octave-band center frequencies. Maximum