AES Audio Engineering Society - Pacific Northwest Section

Around the Puget Sound, Seattle, Washington, U.S.A.

February Meeting Notice
Using Arrays of Loudspeakers for Focusing or Diffusing Sound

Presented by
Mike Seltzer
Jasha Droppo
Ivan Tashev
James (JJ) Johnston
of
Microsoft Corporation
and
Pacific Northwest Section
of
The Audio Engineering Society

7:30pm, Wednesday, February 27th, 2008
Microsoft Research
Building 99, Lecture Room C
Redmond, WA

Directions to Microsoft Research

One of the oldest applications of a loudspeaker array is the venerable old Shure Vocal Master column. Although it probably is more famous as the ruination of many a vocal, there was actually some honest to goodness engineering at work there. Fast forward to today, 40 years later. The sound column has become the Line Array and is the new buzzword in the live sound industry.

Not every loudspeaker array is a line array, and our February meeting won't deal directly with line arrays for live sound, but it will demonstrate two key principles: with appropriate signal processing, you can steer the beam formed by the array, or (with appropriate signal processing) you can cause the array to become a diffuse (rather than point) source, which cannot be localized. These approaches are applicable in home entertainment, communications, and audio systems in public places as museums, libraries, etc.

Four Microsoft engineers, Mike Seltzer, Jasha Droppo, Ivan Tashev, and James (jj) Johnston will present:

- Loudspeaker arrays application in home entertainment and in the office: scenarios and modes. Models on the market. Presented by Mike Seltzer, researcher in Microsoft Research.
- Focusing sound principle and generic beamforming. Loudspeaker's directivity pattern, how to measure it and why it matters. Presented by Jasha Droppo, researcher in Microsoft Research.
- Speakers manufacturing tolerances and robust beamformer design for loudspeaker arrays. Presented by Ivan Tashev, software architect in Microsoft Research.
- Generating a diffuse sound field with loudspeaker arrays. Presented by James (jj) Johnston, audio architect in Microsoft Corporation.

Following the presentations, we will listen to off-the shelf and experimental loudspeaker arrays in various scenarios.

- Home entertainment loudspeaker array from Yamaha.
- Focusing sound and dual beam mode with 16-element experimental loudspeaker array.
- Generation of diffuse sound field with a loudspeaker array.

The Presenters

Mike Seltzer
is a researcher in Speech Technology group of Microsoft Research since 2003. He received his bachelor's degree from Brown University in 1996 and his PhD from Carnegie Mellon University in 2003. His areas of interest include speech recognition,

acoustic modeling, and microphone array processing.

Jasha Droppo
is a researcher in Speech Technology group of Microsoft Research since 2000. He received his bachelor's degree from Gonzaga University in 1994 and his PhD from University of Washington in 2000. His areas of interest include feature transformation, speech and acoustic digital signal processing, noise-robust speech recognition.

Ivan Tashev
is a software architect in Speech Technology group of Microsoft Research since 2001. He received his masters and PhD degrees from Technical University of Sofia, Bulgaria, in 1984 and 1990 respectively. His areas of interest include multichannel audio processing, algorithms for arrays of traducers, and audio signal enhancement.

James (jj) Johnston
works in Windows Live division at Microsoft as an Audio Architect, and is responsible for the room correction and loudness equalization models in Vista, among other things. He is retired from AT&T Bell Labs and AT&T Labs Research, in the Acoustics Research division, where he developed several MPEG-Audio coding methods along with his postdoc researchers Karlheinz Brandenburg and Jurgen Herre.

n.b.
The material presented at our meetings is the opinion of the presenter and not necessarily that of the Society. You are encouraged to conduct your own research and to form your own opinions before adopting the presented material as Truth.

Our meetings are open to anyone interested in Audio. AES membership is NOT required for you to attend our meetings.
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