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AES Audio Engineering Society - Pacific Northwest Section

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

What Is Bandwidth and Why Do I Care? Zoom Meeting

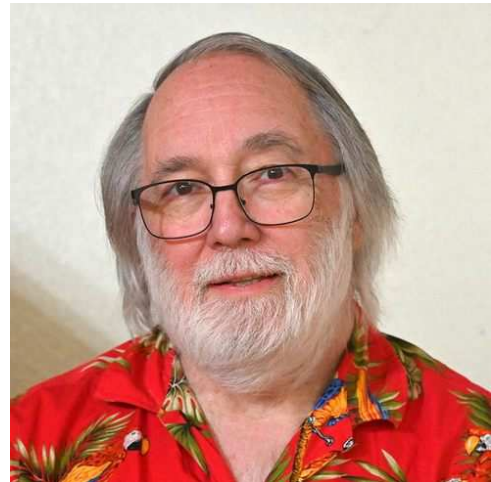
Thursday, November 17th, 2022, 6PM PST (UTC -8)

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Have you ever wondered why your digital audio system can not "miss" that spike that happens entirely between samples? Have you ever wondered how you can get subsample time resolution in digital systems, without even trying? Well, here's the answer, **signal bandwidth**.

This talk explains what restricting the bandwidth of a signal does, necessarily, to the signal. To the first question above, no, that signal can not ever even exist unless it's many, many times outside the bandwidth of the digital system you're examining. To the second question, no, you don't have any "stairsteps" and no, you don't have any "edges" in the reproduced signal.



We'll start with a single "impulse," and show what system bandwidth looks like, why filters look the way they do, and how the output of a digital signal can not have any edges. All of this is due to the required bandwidth limitation in a sampled data system. Along the way, a few bits of disinformation will be revealed and dismissed for what they are.

About James D. (jj) Johnston

James D. (jj) Johnston is Chief Scientist of Immersion Networks. He has a long and distinguished career in electrical engineering, audio science, and digital signal processing. His research and product invention spans hearing and psychoacoustics, perceptual encoding, and spatial audio methodologies.

He was one of the first investigators in the field of perceptual audio coding, one of the inventors and standardizers of MPEG 1/2 audio Layer 3 and MPEG-2 AAC. Most recently, he has been working in the area of auditory perception and ways to expand the limited sense of realism available in standard audio playback for both captured and synthetic performances.

Johnston worked for AT&T Bell Labs and its successor AT&T Labs Research for two and a half decades. He later worked at Microsoft and then Neural Audio and its successors before joining Immersion. He is an IEEE Fellow, an AES Fellow, a NJ Inventor of the Year, an AT&T Technical Medalist and Standards Awardee, and a co-recipient of the IEEE Donald Fink Paper Award. In 2006, he received the James L. Flanagan Signal Processing Award from the IEEE Signal Processing Society, and presented the 2012 Heyser Lecture at the AES 133rd Convention: *Audio, Radio, Acoustics and Signal Processing: the Way Forward*. In 2021, along with two colleagues, Johnston was awarded the Industrial Innovation Award by the Signal Processing Society "for contributions to the standardization of audio coding technology."

Mr. Johnston received the BSEE and MSEE degrees from Carnegie-Mellon University, Pittsburgh, PA in 1975 and 1976 respectively.

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RSVP

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THIS EVENT IS FREE, OPEN TO ALL, AND AES MEMBERSHIP IS NOT REQUIRED

Dan Mortensen

AES PNW 2022-2023 Section Chair

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