

In Memoriam



John Bubbers
1925–2010

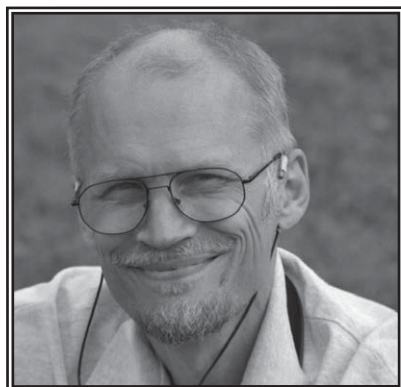
John Bubbers died on May 23 following a long illness with cancer. He was born in Lawrence, Massachusetts in 1925 to German immigrant parents. The family relocated to

Germany in the mid 1930s, returning to New York in 1939. John graduated from Stuyvesant High School and New York University. He had a lifelong love of learning, engineering, and music. Over the years he combined those interests as an audio engineer at radio stations, a record producer, a designer of audio equipment, and an advocate for classical music. John built and owned a factory that made records; the company was the first to manufacture LP stereo records. John was a ham radio operator for over 70 years.

John Bubbers made significant contributions to the Audio Engineering Society over many years, including serving as president, secretary, treasurer, and consulting technical editor of the *AES Journal*. He also

served on the AES Educational Foundation and was the guest editor of the 1998 January/February issue of the *Journal*, which commemorated AES's 50th Anniversary. He received the AES Fellowship Award in 1969, the AES Award in 1974, a Citation Award in 1977, and the Distinguished Service Medal in 1993. He will be remembered by many as a hard-working, honest, and loyal colleague.

John leaves his wife Janice, daughter Susan Scott, and son J. Eric Bubbers and their families. In lieu of flowers, donations in John's memory can be sent to the Winchester Senior Association, 109 Skilling Road, Winchester, MA, 01890-2857, or to the Winchester Hospital, 41 Highland Avenue, Winchester, MA 01890.



Matti Karjalainen
(1946–2010)

In the evening of May 30, Matti Karjalainen passed away at home after a long illness. He was 64 years old and was planning to retire soon. He had a long and extraordinary career as a researcher, educator, and leader in acoustics and audio signal processing.

Matti Karjalainen studied electronics at the Tampere University of Technology and received a doctoral degree on speech synthesis in 1978. He developed the first portable microprocessor-based text-to-speech synthesizer in the world and is often mentioned as a pioneer in speech synthesis of the Finnish language.

Matti started as an associate profes-

sor of acoustics at the Helsinki University of Technology (TKK) in 1980. There he founded teaching in audio signal processing and speech technology from scratch, including for example courses on psychoacoustics, speech processing, and signal processor programming.

In 1986 Matti became a full professor, and for more than ten years he was the only university professor in acoustics in Finland. He was the head of the Laboratory of Acoustics and Audio Signal Processing at TKK until 2006. During this time the number of laboratory personnel increased drastically from three to about 40. Matti was the supervisor of 24 doctoral theses and over 100 master's theses. His laboratory is now part of the Department of Signal Processing and Acoustics of the Aalto University. Three of his former doctoral students are professors in the department.

In the 1980s, Matti started to apply his knowledge of psychoacoustics to computational auditory models. He later considered this as some of his most groundbreaking work. Similar and more developed perceptual models are now a core part of lossy audio coding and objective evaluation of audio and speech quality.

Matti understood early in his career that it was important to go to conferences and meet researchers worldwide, because in Finland the academic world in audio and acoustics contained only a few people. His wide international network of friends and colleagues helped his students to get in touch with experts outside their home country. Matti's excellent international connections helped to start unofficial collaboration and researcher exchange with several universities, and after some time his laboratory became a regular partner in European projects and COST networks.

In the early 1990s Matti expanded his research from speech to music. This happened a few years after he had started working on software environments for real-time signal processing. He then revealed the practical potential of physical modeling in sound synthesis by implementing a real-time acoustic guitar synthesizer; he developed the programming environment and DSP board for the signal processing. For tuning the guitar synthesizer, he proposed the use of a Lagrange fractional delay filter, which is now a standard technique in this field. Matti later applied physical modeling to other stringed and wind instruments,

such as the Finnish national instrument, the kantele. Matti was never too tired to think about acoustic problems. For example, late at night after a conference banquet he would develop sophisticated algorithms for his guitar synthesizer.

Sound synthesis research also led Matti to search for other uses for fractional delay filters. A group of researchers led by him then wrote a large review paper on fractional delay filter design, which became a highly cited article. Furthermore, he participated in the development and application of warped digital filters in audio, such as in loudspeaker equalization. Fractional delay and frequency-warped digital filters are used in numerous audio applications, ranging from audio equalization and HRTF modeling to auditory modeling and audio coding, and are still topics of active research.

In 1995, an eight-channel A/D-D/A converter was built in Matti's laboratory and was integrated into a custom-made programming environment with the goal to synthesize multiple musical instrument sounds simultaneously in real time. This device was also used for the first tests in multichannel audio reproduction, which led to the development of many techniques for spatial audio in Matti's group. This work still continues in the laboratory. In another significant branch of his research, Matti investigated the simulation, measurement, and visualization of room acoustics, which led to the formation of yet another research group on room acoustics modeling at TKK. It can be said that Matti's work brought about the birth of four distinct research groups with dozens of active researchers.

The research on spatial sound made Matti realize that a headset with microphones could be very useful. He came up with the idea of augmented reality audio, in which a user could hear the natural environment and at the same time the sounds transmitted from a remote location, spatialized in a desired manner. The user's voice and environmental sounds could also be captured by the two microphones placed in the ears. This technology has great

potential for the future. Headphone audio and related signal processing remained one of Matti's greatest interests until the last months of his life.

The number of AES publications by Matti Karjalainen is very large. He contributed to 20 JAES articles and to 47 articles published in 23 AES conferences and conventions. Matti was also active in organizing audio-related conferences. In 1999, he was the general chair of the IEEE Workshop on Application of Signal Processing to Audio and Acoustics (WASPAA). With his Finnish colleagues and former students, he participated in the organization of two AES conferences: the AES 16th International Conference on Spatial Sound Reproduction and the AES 22nd International Conference on Virtual, Synthetic and Entertainment Audio. In 2008, he was the Vice Chair of the 12th International Conference of Digital Audio Effects (DAFx-08).

Matti had long term cooperation with companies such as Nokia and loudspeaker manufacturer Genelec. For his scientific and educational merits in audio signal processing, he received the Audio Engineering Society fellowship in 1999, the AES silver medal in 2006, and the IEEE fellowship in 2009.

Matti Karjalainen is survived by his wife Raija Vappu Karjalainen, his daughter Raisa, and his son Sampo.

On his 60th birthday, Matti founded the Matti Karjalainen Fund inside the Acoustical Society of Finland. The fund supports young students in acoustics. Donations to the fund can be made as a bank transfer with the following information: Bank: Nordea Finland; Beneficiary: Akustinen Seura; IBAN: FI98 1011 3000 2059 47; BIC: NDEAFIHH.

Matti was a visionary in audio and acoustics who inspired his students and colleagues with his endless enthusiasm and positive attitude. He had an open heart, and everybody felt comfortable when dealing with him. We greatly miss our most important teacher and a great friend.

Vesa Välimäki and Ville Pulkki