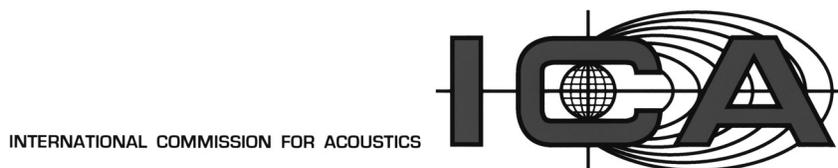


INTERNATIONAL COMMISSION FOR ACOUSTICS

EARLY CAREER AWARD



Tapio Lokki

2013

The ICA Early Career Award is presented at the Triennial Congress to an individual who is relatively early in his/her professional career (about 10-15 years of active career), who has contributed substantially, through published papers, to the advancement of theoretical or applied acoustics or both and who has been active in the affairs of Acoustics through his/her National Society, other National Society(ies), Regional or International organizations. The Award consists of an Award Certificate, a Medal, and an Honorarium.

PREVIOUS RECIPIENTS

Oleg Sapozhnikov
Timothy J. Leighton
Nico F. Declercq
Torsten Dau



CITATION FOR TAPIO LOKKI

. . . for contributions to room acoustics, particularly for novel subjective and objective assessment methods of concert halls.

5 JUNE 2013 • MONTRÉAL, CANADA

Tapio Lokki was born in Helsinki, Finland, in 1971. He studied at the Helsinki University of Technology (TKK), the most respected technical university in Finland, and obtained an MSc. (Tech.) in Electrical Engineering in 1997, and a DSc. (Tech.) in Computer Science in 2002. Tapio began his research career in room acoustic modeling and auralization. His doctoral thesis was titled “Physically based Auralization – Design, Implementation, and Evaluation” which concentrated on how physically-based room acoustic simulation could be made so accurate that a human listener could not distinguish it from a recording. Acoustic quality evaluation had a central role in the thesis, and it already paved the way for his future research on assessment of concert halls.

After receiving his PhD, Tapio worked for five years as a lecturing researcher at TKK. He taught virtual reality, and conducted research on virtual auditory environments. In 2007 he was granted an Academy Research Fellow position by the Academy of Finland that enabled him to concentrate purely on research again. A real break-through in Tapio’s career took place in 2008, when he received a Starting Grant of the European Research Council (ERC), the most prestigious funding agency in Europe. It was the first ever ERC grant in the area of acoustics despite a success rate below 3% over all areas of research. Since then Tapio has led a research team to pursue a complete understanding of concert hall acoustics. The field has been investigated for over 100 years, but still there are secrets that wait to be revealed. To foster this research even further, Aalto University appointed Tapio to a tenured associate professor position in 2012. Since 2007 Tapio has been an extremely productive researcher, and he has authored or co-authored 26 journal articles including 9 articles in the *Journal of the Acoustical Society of America*. In total, he has published over 35 journal articles and over 100 conference papers.

For the past few years Tapio has concentrated on subjective and objective evaluation of concert halls. This has resulted in several highly significant results in the area. First of all, Tapio invented the loudspeaker orchestra in which the loudspeakers on a stage simulate a symphony orchestra. These are used to measure the spatial impulse responses at various positions in the audience area. By convolving the measured responses with anechoic recordings of musical instruments, it is possible to listen to a full orchestra in a laboratory environment and move between different seats or even between different halls instantaneously. This approach has enabled subjective assessment of concert halls in a way that has not been possible before. It is a stunning experience to listen to a Bruckner’s symphony in Amsterdam Concertgebouw, jump to a corresponding seat in Berliner Philharmonie, and then enjoy the rest in Vienna Musikvereinsaal. To derive as much information as possible from the listening tests, Tapio has introduced the sensory evaluation methodology for subjective assessment of acoustics. This approach originated in the food and wine industry, but Tapio has proven that it is a perfect fit for concert halls as well.

Tapio’s main results in objective concert hall evaluation are based on novel techniques to analyze spatial impulse responses ranging from new signal processing techniques to clever visualizations of the responses. Tapio’s ultimate goal in this area is to develop new objective measures that have a strong correlation to the subjective preference, a factor that is mostly lacking in the traditional room acoustic attributes. The results so far show remarkable progress in the area, and the analysis is able to capture issues that have previously gone unnoticed. In addition, the novel visualizations are intuitive and easy to communicate not only to acousticians but to concert goers as well. Tapio is often seen on Finnish television or interviewed on the radio as an acoustics expert. He was awarded with the Academy of Finland Award for the social impact of his work in 2011.

One of the main events for Tapio last year was leading a scientific expedition to concert halls across central Europe. Tapio and his team toured around Europe rock-band style.

Every evening they landed in some of the most famous concert halls in the world, set up the measurement system, and spent the night conducting the measurements. After dismantling the system in the early morning, the team retreated to their bus, and slept while the driver headed to the next hall. This tour of the “Loudspeaker Orchestra” was a great success and resulted in the collection of an enormous amount of data. The corresponding analysis is still in progress, but it is obvious that something ground-breaking will result. This is certainly not the last time you will hear of Tapio!

In addition to concert hall acoustics, Tapio is interested in audio in general. This is seen in his research activities that have included investigations of audio augmented reality and gesture controlled user interfaces with auditory feedback as well. A startup company was founded to commercialize these ideas, for which Tapio was awarded the Aalto Initiative of the Year prize in 2011.

Tapio is a long-term president of The Acoustical Society of Finland. Before that he served as the secretary and a board member of the Society. Most recently Tapio has been active in the European acoustics community as well, and he was elected to the position of General Secretary of the European Acoustics Association for the 2013-2016 term.

Tapio is an outgoing person and is easy to approach. He is an open-minded researcher who is always willing to get involved in intriguing scientific discussions. Acoustics and audio are close to Tapio’s heart in many ways. In addition to his acoustics research, he is an active musician. He has over 30 years of musical expertise, including 11 years as a clarinetist in the national youth symphony orchestra *Vivo* and six years as a conductor of a student wind orchestra. This gives him credibility among musicians, and helps in discussions with them.

Tapio is married to Jutta Jaakkola and they have an 8-year-old son, Vilppu Lokki.

LAURI SAVIOJA