Shoichi Koyama Invited Lecture - Sound field recording and reproduction and its extension to super-resolution

The IEEE New Zealand Central Section was excited to welcome Dr. Shoichi Koyama from the University of Tokyo in Japan. He spoke on "Sound field recording and reproduction and its extension to super-resolution". This seminar was held on Friday 17th April at 11:00am in the room CO350, Cotton Building in Victoria University of Wellington. The seminar attracted a reasonable turnout of 20, mainly consisting of members and students.

Abstract: Physical reproduction of a sound field enables us to construct more realistic audio systems. Since large scale audio systems are becoming more feasible because of the recent development of acoustic sensors and transducers, this kind of technologies have attracted attention in recent years. In sound field recording and reproduction, a way to convert signals received by microphones into driving signals of loudspeakers is important. I introduce a method using wave field reconstruction (WFR) filter and its application to a real-time sound field transmission system. Since a quality of the reproduced sound field depends on intervals between array elements in current methods, a lot of microphones and loudspeakers are required to achieve highly accurate reproduction. Recent advances indicated that higher reproduction accuracy can be achieved above the spatial Nyquist frequency when there are fewer microphones than loudspeakers, i.e., super-resolution in sound field recording and reproduction. Two approaches to super-resolution are introduced, which are based on a prior information on sound sources to be reproduced and a sparse signal representation.

Speaker Biography: Shoichi Koyama received the B.E., M.S., and Ph.D. degrees from the University of Tokyo, Japan, in 2007, 2009, and 2014, respectively. He joined Nippon Telegraph and Telephone Corporation (NTT) in 2009 and started the career as a researcher in acoustic signal processing at NTT Cyberspace Laboratories (currently Media Intelligence Laboratories). In 2014, he joined the Graduate School of Information Science and Technology, the University of Tokyo, as an Assistant Professor (Research Associate).