## ESTIMATION OF ACTIVE SPEAKER'S DIRECTION USING PARTICLE FILTER

Mitsunori Mizumachi and Katsuyuki Niyada

## ABSTRACT

Building in-car human-machine interfaces, information on speaker's direction is helpful for speech enhancement and controlling a video camera. Direction-Of-Arrival (DOA) estimation has been an essential problem in multi-channel acoustic signal processing. This paper proposes two-step particle filtering in a spectro-spatial domain for achieving robust DOA estimation under noisy environments such as in-car environments. The two-step filtering aims at combining the advantages of both traditional cross-correlation (CC) and generalized cross-correlation (GCC) methods. In multiple sound source conditions, proposal particle distribution given by DOA estimates, which are previously obtained, contributes to track the sudden change of an active sound source without latency. Experimental results show that the proposed method is superior both in accuracy and stability to conventional CC and GCC methods under noisy and slightly reverberant environments.