Acoustic source localization and its application in conference recording system (WA1b-12)

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Introduction
Acoustic source localization is an interesting and practical topic in the acoustical engineering. It refers to a machine’s ability to localize the acoustic source in direction and/or distance. Nowadays, with the fast developments in electronic technology in computers and robotics, acoustic source localization is becoming increasingly important as it is one of the vital components in the interface between machines and the environment. For instance, speaker localization can help for a tour guide robot to enhance its speech understanding capabilities by filtering noises from other sources.

Methodology

Tour guide robot
Microphone array for localization

There is a great potential for advancing the functions of a conference recording system with technologies using acoustic source localization. In the market, existing products for conference recording rarely contain intelligent functions. The objective of our project is to make use of acoustic source localization and other engineering techniques such as face detection to achieve the function of speaker detection in conference recording. With these kinds of functions, conference recording system will become more interactive with speakers and it will be more convenient for users to keep-track of and to review the records of important meetings.

Typical conference
Conference recording system

Acoustic source localization
Simple conference recording system

Tour guide robot
Microphone array for localization

TDOA setup
PHAT method

Viola-Jones algorithm
Face detection

Result

Conference recording system

GUI displaying current speaker
Speech record