

# Bi-Channel Sound Source Localization System for Speaker Detection

S. Khennouf<sup>1</sup>

<sup>1</sup> Mohamed BOUDIAF University, Faculty of Technology, M'sila

- *Extended Abstract* -

## Abstract

This paper deals with the problem of speaker detection using audio signal processing, which consists in localizing the current position of a talking speaker in a smart room [Maganti 2006]. This task represents the first step of automatic speaker tracking, which is the overall goal of our research work. An estimation of the current position of the talking person is obtained by comparing the left and right signals captured with two cardioids microphones that are placed in the left side and right side of the meeting room, respectively [Neumann 2009]. The distance separating the two microphones is fixed to a constant value  $L$  (*figure 1*). The idea of using two cardioids microphones is inspired from the human ears, which act as two sound sensors, enabling human beings to find the exact direction of a talking person with great precision.

The speaker tracking experiments are conducted off-line in a small room without echo elimination. The obtained results show quite good performances by using the proposed approaches and suggest that those techniques could be efficiently utilized in speaker tracking and localisation.

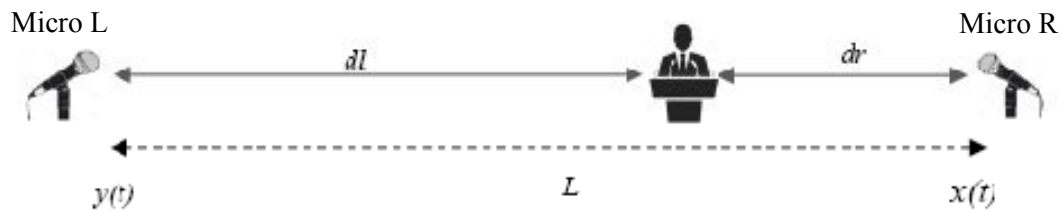


Figure 1. Disposition of the two cardioid microphones for speech signal acquisition.

## Discussion

In this research work, we conceived a system for localizing the active speaker, in order to track the speakers who are sharing discussions or debates in a same meeting room.

We will not report all the results obtained in this paper (*extended abstract*), but only give an overall appreciation on the performances of the proposed system, with some recommendations for the correct tracking in real situations, such as speaker tracking applications in smart meeting-rooms.

Concerning the method of speaker localization, the overall results show that the speaker position localization is quite good (*the accuracy is about 90%*), and ready to use for the tracking process in real applications.

## References

[Maganti 2006] Maganti H. K. and Perez D. G. (2006), "Speaker Localization for Microphone ArrayBased ASR:The Effects of Accuracy on Overlapping Speech". 13ICMI'06, November 2–4, 2006, Banff, Alberta, Canada.

[Neumann 2009] Neumann J., Casas J. Ramón M., Dusan R., Hidalgo J. (2009), "Integration of audiovisual sensors and Technologies in a smart room". Personal and Ubiquitous Computers. ISSN 1617-4909. Volume 13 n° 1, year 2009, pp 15-23.