



ISTITUTO ITALIANO  
DI TECNOLOGIA

## TITLE

Method for auto-calibrating a set of acoustic signal sensors, in particular microphones, and corresponding system

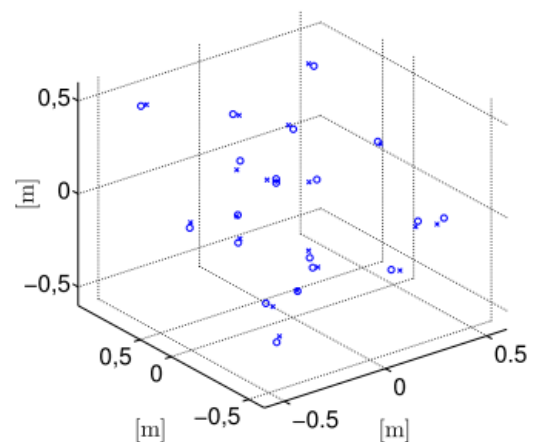
## INVENTORS

Marco Crocco, Alessio Del Bue, Vittorio Murino

## DESCRIPTION

This technology is a breakthrough in the auto calibrating techniques for multiple acoustic sensors.

Given a set of sources of acoustic events in a spatial region, flight times between each source of acoustic events and each sensor is measured. Then, emission times of said acoustic events are acquired, and flight times are obtained as a function of the respective emission times. Distances between sources and sensors are calculated from the flight times. Finally, the estimated positions of both sensors and sources of events are calculated by a maximum likelihood estimation procedure, which includes performing a least square optimization minimizing a cost function between Euclidean distances of the positions of the sensors and of the sources and the calculated distances.



## APPLICATIONS

Countless applications that use multiple acoustic sensors distributed in the environment need to know the positions of sensors very precisely. For example, when the direction of arrival of an acoustic signal has to be estimated, an unperfected knowledge of sensors position can completely compromise the performance of the entire system.

## KEYWORDS

acoustic sensor array, position

## BIBLIOGRAPHIC DATA

Procedimento di auto-calibrazione di un insieme di sensori, in particolare microfoni, e relativo sistema

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