Journal of Acoustical Engineering Society of Iran, vol. 3, no. 1, 2015

A hybrid localization method for near and far-field acoustical sources

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Abstract

This paper proposes a hybrid acoustical source-location finding method using the hyperbolic localization and cross-bearing intersection techniques. The method employs the time delays estimations (TDE) observed from multiple sensors in order to find the location of the acoustic source in the near or far-filed. Since according to the existing literature, the conventional hyperbolic localization method does not provide enough accuracy for position-finding (PF), we propose that this method only be employed for obtaining TDEs. Then, using TDEs, the source position will be determined using the cross-bearing method. The simulation results show the significant improvement in source-position estimations as compared to traditional hyperbolic PF method. Furthermore, we also propose a method for accelerating the runtime of the optimization algorithm in the hybrid PF method.

Keywords: Localization, Acoustical sources, Direction of arrival, Cross bearing, Time delay estimations.

pp. 10-25 (In Persian)

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[DOR: 20.1001.1.23455748.1394.3.1.5.5]

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