



## Acoustic noise reduction and speech enhancement via particle swarm optimization

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**Abstract-** This paper addresses the problem of acoustic noise cancellation by adaptive filtering algorithms. To solve acoustic noise reduction and speech enhancement problems, we propose a modified predator-prey particle swarm optimization (MPPPSO) to design adaptive noise canceling based on swarm intelligence heuristic search.

The steady-state error of the predator-prey particle swarm optimization (PPPSO) algorithm is very large for a large filter length and non-stationary input. The MPPPSO can improve the previous PPPSO algorithm when a large filter length is used. The MPPPSO algorithm shows significant improvement in the System mismatch (SM) and Output signal-to-noise ratio (SNR) values. We present simulation results of the MPPPSO algorithm that confirm the superiority and good performance in comparison with the PPPSO and the normalized least mean square.

**Mots Clés :** Acoustic Noise Cancellation; Particle Swarm Optimization; predator-prey PSO; Output signal-to-noise ratio (SNR); System mismatch (SM).

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