

International Journal of Vehicle Design  
Volume 31, Issue 4, Pages 440-451  
Inderscience Publishers, 2003

## Background Noise Cancellation for Hands-Free Communication System of Car Cabin Using Adaptive Feedforward Algorithms

Wu, Jian-Da; Lee, Tian-Hua; Bai, Mingsian R.

### Abstract

This paper describes the background noise attenuation for hands-free communication systems of car cabins using an adaptive feedforward noise control algorithm. For a hands-free telephone system, the quality of communication usually is affected by background noise such as engine noise and aerodynamic noise. In the present study, an active noise control (ANC) design for reducing car cabin periodic background noise from engine and broadband random noise using adaptive feedforward control is investigated. The control algorithm is based on the well-known filtered-x least mean square (FXLMS) with multi-sine synthesised reference signal and frequency counting technology implemented on a digital signal processor (DSP) platform. Experimental results indicated that the proposed design was effective suppressing 15 dB in periodic engine noise and 2–3 dB in broadband random background noise.

Key words : Hands-free communication; Car cabin; ANC; DSP