

Feeling your way home: the design of haptic control interfaces within cars

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Abstract

Computing and communications-based technologies (e.g., navigation systems) are increasingly being implemented within cars. There are clear concerns regarding the use of multi-function screen-based interfaces (e.g., touch-screens) for such systems which require significant visual attention. This paper discusses the potential for an increased use of haptic (tactile and kinaesthetic) cues within future control interfaces. As part of a baseline analysis, two studies are described which assessed 1) how difficult it is for drivers to carry out current in-vehicle tasks without vision, and 2) what design features facilitate non-visual use of controls.

The first study looked at the use of in car controls without vision. Whilst stationary and looking ahead, twenty participants were given a series of conventional in-vehicle tasks to carry out within their own cars. A camera was used to capture hand movements. The second study looked at the tactile cues that visually impaired participants use to facilitate the initial exploration of an unfamiliar piece of audio equipment.

Introduction

Increasingly, computing and communications-based technologies are being implemented within cars. There is need for fundamental research and development to ensure that the control interfaces for future cars require minimal visual demands. The needs, abilities and preferences of drivers (in particular older drivers) are clearly a prime focus, as part of a user centred design approach. In addition, it is argued that much can be learnt from the experience and strategies adopted by people who are blind or have low vision (a non-user group).

A consortium of organisations (including HONDA R&D and Loughborough University) has been formed under the title of BIONIC (Blind Operation of In-car

In D. de Waard, K.A. Brookhuis, J. Moraal, and A. Toffetti (2002), *Human Factors in Transportation, Communication, Health, and the Workplace* (pp. 189 - 194). Maastricht, the Netherlands: Shaker.