COMUNICAR: Designing multimodal interaction for advanced in-vehicle interfaces

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Abstract

The paper reports on the work done in the initial phases of the European Information Society and Technology (IST) Project Comunicar. Eleven partners co-operate in the project, including leading European car industry, suppliers, and universities. Comunicar has the ambitious goal of designing a multimodal driver-vehicle interface that integrates a large number of state of the art services and devices. The introduction of such systems puts forward a number of problems related to potential interference with the primary task of driving, ease of use, and acceptance for end users. The approach adopted here was to define the initial specifications for the design of multimodal interaction compliant with the major findings stemming from the Human Factors research tradition.

Introduction

In the domain of on-board information support systems, the push to introduce new devices is very strong because of both the potential marketing advantages and of lowering costs. Several top-models of cars are already equipped with advanced support systems like navigation support, cruise control, blind spot detection, etc. Other systems, such as night vision, speech recognition, distance diagnosis of car malfunctioning, are currently being developed and are sometimes available as prototype. The tendency to introduce new systems as soon as they are available is partially contrasted by safety concerns (Michellone & Levizzari, 1999). The increase in devices and information, if not well performed can, however, result in interference with the primary task of driving, with dangerous and potentially harmful consequences. The potential problems range from cognitive overload to lowered attention to external stimuli, and stress of being outside the control loop (Lee *et al*. 1997). In this context, the goal of the Comunicar (COmmunication Multimedia UNit Inside CAR) Project is to design an advanced Human Machine Interface (HMI) that integrates a variety of information and support systems by both exploiting the potential of multimodal interaction (haptic, acoustic, etc.) and by introducing a component for the dynamic management of interactions. The two

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