D**elivery of Traveller Information Supported on Surprise and Relevance**

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**Abstract**

In complex environments such as urban spaces, ubiquitous computational devices may be used to collect many kinds of information about the agents - mostly human beings - and their surrounding elements - transportation systems, buildings, weather, etc. This information can be shared among the various agents in order to improve the efficiency of the urban space.

Devices such as cell phones, Personal Digital Assistants (PDAs) and Personal Navigation Assistants (PNAs) can undoubtedly help humans perform better in these scenarios. However, although evolution already provided humans with the selective attention components that indicate which few aspects of the world are significant to the particular problems at hand, at a given time, and place, the amount of information received by those selective attention components may be itself a problem and compromise agents performance. Moreover, with the increase in the number of ubiquitous computing devices this may become even worse.

Humans will receive a overwhelming quantity of information which they cannot handle. This is even more problematic because most of the time this information is provided in a way that needs attention and intervention from the human agent, which means that s/he has to interrupt whatever was doing. This phenomena is sometimes referred as “Interruption overload” [1] and is especially problematic (or dangerous) if the human agent is performing critical tasks like driving a car.

Given this wealth of information coupled with human real-time multi-task processing constraints, devices that incorporate selective attention mechanisms in order to decrease the number of interruptions are fundamental to achieve success in the developing traveller information systems.

In this work, we address the issue of selecting information in complex urban scenarios, with a special focus on traveller information systems in the context of intelligent transport systems (ITS). However, the developed selective information mechanisms should easily be deployed along other contexts.

Inspired on natural selective attention studies, our approach involves the integration of an artificial selective attention component on technological devices, such as the ones already mentioned above, so that these devices can autonomously select and provide only the relevant information for the human agent, preventing this human agent from a superabundance of information and interruptions.

In cognitive science, attentional focus is linked with expectation generation and failure, i.e., with surprise [2]. Therefore, the proposed artificial selective attention component relies on a cognitive model of surprise [3][4]. However, surprise is not enough, since only information that is surprising and useful is relevant. For this reason, the system must also incorporate a measure of the usefulness of the information for a specific human agent, based on her/him particular intentions at hand at a given time and place.

The paper illustrates with an example a scenario in which a device collects available information about the best way to drive from point A to point B at a specific date/time, and provide that information to the human agents for whom this information is a surprise and relevant in the context of a specific situation.

**References**

