ik heb onderstaande abstract opgestuurd naar iea2006. De lengte was beperkt to 500 woorden, daarom is het soms wat beknopter dan me lief is. En ik heb al gezien dat er in de eerste regel van de derde alinea het voorzetsel 'of' is weggevallen bij het deleren van tekst ...

Abstract title: Cooperative assistance for human-system interaction
Author Terken, Jacques , Eindhoven, Technische Universiteit Eindhoven , Netherlands
Co-author(s): Bunt, H, Tilburg; Dam, H, Eindhoven

First keyword: Human computer interaction
Other keyword: Scientific

Abstract text:

Despite design heuristics such as help users recognize, diagnose, and recover from errors there are still many cases in human-system interaction where users run into trouble and do not easily recover from problems. Comparing this with human-human communication, we see that humans have developed subtle mechanisms to deal with problem situations. The underlying idea of the research described in this paper was that we might take inspiration from error recovery mechanisms in cooperative human-human communication in order to improve human-system interaction.

First, we conducted observations people ordering print jobs at a copy shop. We identified three main mechanisms of cooperative assistance in human-human communication: problem prevention, problem smothering and problem solving-on-demand. In the case of problem smothering, the communicative partner reacts to subtle verbal and non-verbal signs from the partner that there is a communicative problem and takes a proactive approach to solving problems in an early stage. This led us to define two main characteristics of cooperative assistance: a proactive attitude, and providing help that is tuned to the context.

In a second study we observed users filling in a form through a GUI to identify subtle signs of arising problems, focusing on dropdown boxes. We found that users show particular patterns in their mouse behaviour in the case of problems. Some characteristic patterns were opening-closing-reopening a dropdown box, and keeping the mouse cursor at the same place for several seconds (resembling hesitations in the receiver in human-human communication).

On the basis of these observations, we designed a mechanism for problem smothering in form-filling applications in human-system interaction. The mechanism senses hesitations and provides context-sensitive information through a small pop-up window (similar to a Tooltip). Precise definitions of what constitutes a hesitation were obtained in an experiment where people filled in a form in which problems were intentionally created (primarily consisting of incompre-

hensible options in drop-down box). A large number of features were analyzed, but it was found that time on option was the best indicator of a problem situation (in terms of Precision and Recall measures): in case of a problem, the cursor would stay on the problematic option for more than three seconds.

In a final experiment a number of diff]eJlnt implementations of the problem smothering mechanism were evaluated. Again, problems were intentionally created, so that the diagnosis of the problem was evident. Users very much appreciated the context-sensitive nature of the help. However, in most implementations of the mechanism, users rejected the proactive mechanism in favour of the possibility to control the assistance by an explicit request for assistance. Only if help was provided in the periphery, the appreciation of proactive help approximated that of help on demand.

We conclude that context-sensitiveness is an essential property of cooperative assistance in the context of GUIs, but that being proactive may not be essential. We discuss potential explanations for the findings both in terms of possible shortcomings of the implementation of the mechanism and of inherent differences between human-human verbal communication and interaction with a graphical user interface.