TOBI demonstration 1: BCI interface to AT software

Background and idea:
BCI technology aims at increasing people's communication and control capabilities by providing access to a variety of devices (virtual keyboards, Internet, etc.). Our MI-based BCI system has been integrated into Assistive Technology (AT) software, thus allowing people with impaired motor skills to convey typed messages to the external world as well as browse documents on the Internet. The AT platform QualiWORLD has been chosen for our experimentation, providing a variety of applications as well as user input alternatives replacing the standard mouse and keyboard.

Text editor prototype:
“Right” command selects the scanned group, row or character. “Left” command reverses the scanning order to speed up character typing.

Web browser prototype:
“Right” command selects the scanned link or menu button. “Left” command switches between the web browser and the View Menu, which allows the user to browse the web and zoom/scroll in the documents.

BCI-to-QualiWORLD interface:
The BCI-to-QualiWORLD interface enables control by simultaneously processing BCI-actuated commands and events by the AT software, in a shared control approach. QualiWORLD sequentially scans the controls of the focused menu. The user performs two different MI tasks to move the feedback bar either left or right. Upon reaching the end of the designated area, the respective command is communicated to QualiWORLD. “Right” command selects the scanned element, while “left” command is used to navigate among different menus. The shared control prevents erroneous actions (e.g. closing the application) and decides the effects of the “left” command according to the application.

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