Enhancing an Eye-Tracker based Human-Computer Interface with Multi-modal Accessibility Applied for Text Entry

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Abstract

In natural course, human beings usually make use of multi-sensory modalities for effective communication or efficiently executing day-to-day tasks. For instance, during verbal conversations we make use of voice, eyes, and various body gestures. Also effective human-computer interaction involves hands, eyes, and voice, if available. Therefore by combining multi-sensory modalities, we can make the whole process more natural and ensure enhanced performance even for the disabled users. Towards this end, we have developed a multi-modal human-computer interface (HCI) by combining an eye-tracker with a soft-switch which may be considered as typically representing another modality. This multi-modal HCI is applied for text entry using a virtual keyboard appropriately designed in-house, facilitating enhanced performance. Our experimental results demonstrate that using multi-modalities for text entry through the virtual keyboard is more efficient and less strenuous than single modality system and also solves the Midas-touch problem, which is inherent in an eye-tracker based HCI system where only dwell time is used for selecting a character.
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Index Terms

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