EYE-BASED HUMAN-COMPUTER INTERACTION (HCI): A NEW KEYBOARD FOR IMPROVING ACCURACY AND MINIMIZING FATIGUE EFFECT

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*Abstract*

*The current problems of keyboard on eye-based Human Computer Interaction* (HCI) *are accuracy, typing speed, fatigue, and the use of combination keys. We propose a new keyboard consist of two parts: the moveable layout and the navigator keys (fixed and transparent). The user appearance detection method is used for reducing the fatigue effect. The adding shortcut keys to the main layout allowing user executes a special functions through combination keys. The new keyboard has advantages on high accuracy, fast, allowing combination keys, and could minimize fatigue effect. The experiment results show that the new keyboard could achieve better accuracy (92.26%) compared to the fixed keyboard (78.57%). Also, the new keyboard improved accuracy 134.69% than the fixed keyboard(210.28%) when used for typing fourteen character over eye-based HCI. Moreover, we measured the fatigue effect by using Electro Encephalo Graph (EEG) over both methods and the result shows that the new keyboard could minimize fatigue better than the fixed keyboard. By implementing the new keyboard on real eye-based HCI, user could type characters easily, fastly, and no burdened with fatigue effect.*

*Keywords: Keyboard, Eye-based HCI, Accuracy, Typing Speed, Fatigue.*