

## DEVELOPMENT OF PEN-BASED NOTE-TAKING SYSTEM FOR PERSONS WITH VISUALLY DISABILITIES

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**ABSTRACT.** *We frequently take notes when attending class. The method of note-taking includes writing much information as a paper record. However, we cannot write such notes in a notebook if no visual feedback information exists. We propose a pen-based note-taking system, designated as the Pen-Talker, for a visually disabled person to use on an ultra-mobile PC. Using the Pen-Talker, a blind novice user with acquired blindness can input Japanese characters directly instead of through a keyboard without much training. This paper describes the system design concept. We also investigate a higher level recognition engine based on hybrid recognition, which integrates on-line and off-line recognition algorithms; we restructure the input interface using the ultra mobile PC with a voice-assistance function. Screen information is given to users via a built-in a screen reader. Therefore, the Pen-Talker is useful as note pad software using a button operation that is simple for even a blind novice user. Recognition experiment results show that recognition accuracy has improved to 93.3% for eight blind subjects, which is an extremely high score compared to that of our previous system. Results confirmed the possibility of practical use of the proposed system.*

**Keywords:** Pen-input system, Handwriting recognition, Visually disabled, Tablet PC

**1. Introduction.** The number of visually impaired persons is increasing because of eye diseases and traffic accidents. Of them, about 200,000 people in Japan have developed acquired blindness. Blind people have been interested in computer use as a communication assistance mode. In general, users are able to input a Japanese character using a keyboard on desktop PC. Notwithstanding, because a blind user cannot see the key position, keyboard operation is onerous. Furthermore, the Japanese language typically requires the use of about 3,000 commonly used characters of kanji (Chinese characters), hiragana, and katakana. For those reasons, computer support for blind people has become an important theme. A word-processor using a keyboard is commercially available for blind users today. However, users must learn to use the process of software conversion from kana to kanji using a keyboard. This software must select the proper kanji character from among various candidates of the same kana sound (called homonyms). Consequently, keyboard operation is not a suitable method for novice users in Japan.