Recognizing postures in vietnamese sign language with MEMS accelerometers

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Abstract: In this paper, we discuss the application of microelectronic mechanical system (MEMS) accelerometers for recognizing postures in Vietnamese Sign Language (VSL). We develop a similar device to the Accele Glove [6] for the recognition of VSL. In addition to the five sensors as in the Accele Glove, we placed one more sensor on the back of the hand to improve the recognition process. In addition, we use a completely different method for the classification process leading to very promising results. This paper concentrates on signing with postures, in which the user spells each word with finger signs corresponding to the letters of the alphabet. Therefore, we focus on the recognition of postures that represent the 23 Vietnamese-based letters together with two postures for "space" and "punctuation." The data obtained from the sensing device is transformed to relative angles between fingers and the palm. Each character is recognized by a fuzzy rule-based classification system, which allows the concept of vagueness in recognition. In addition, a set of Vietnamese spelling rules has been applied to improve the classification results. The recognition rate is high even when the postures are not performed perfectly, e.g., the finger is not bended completely or the palm is not straight. © 2007 IEEE.

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Index Keywords: Classification (of information); Fuzzy rules; Gesture recognition; Human computer interaction; MEMS; Accele Glove; Sign language recognition; Vietnamese sign language (VSL); Accelerometers

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