

ABSTRACT

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HAND SIGN LANGUAGE RECOGNITION USING ARTIFICIAL NEURAL NETWORK

(xii + 67 pages; 45 figures; 6 tables; 1 appendix)

Hand sign language users prioritize visual communication language using the arm and hand movements. User of the hand sign language comes from wide range of communities such as military, diver community, and also for human-computer user. The basic goal of human-computer interaction is to improve the interactions between users and computers by making computers more usable and receptive to the user's needs. Another goal is to design systems that minimize the barrier between human's cognitive model of what they want to accomplish and the computer understanding of the user's need. The use of human-computer interaction can precisely improve efficiency rate and get the jobs done faster.

In this research a special glove with the accompanying devices are designed to detect the position of the hand and fingers and to send the information to the computer. Artificial neural network with backpropagation algorithm is used as the sign language recognition method in a computer. Hand and fingers position were initially recorded as the training sets in the computer. This training set are used to train the artificial neural network, using backpropagation algorithm to recognize various hand and fingers positions as alphabets. The resulting trained artificial neural network is used to recognize hand and fingers position in real time.

The sign language recognition program with artificial neural networks has successfully recognized different hand gestures that represent the alphabet with an average accuracy of 58.65 percent. Many improvements are needed to be done before it can be used for public use such as to improve the accuracy using more robust sensor, and to create more portable device.

References: 17 (1933- 2011).