

A novel home appliance control system for people with disabilities.

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摘要

Abstract

PURPOSE: This research proposed an eyeglass-type infrared-based home appliance control system for spinal cord injured (SCI) with tetraplegia. **METHOD:** This system is composed of four major components: A headset, an infrared transmitting module, an infrared receiving/signal-processing module, and a main controller, the Intel-8951 microprocessor. This design concept was based on the use of an infrared remote module fastened to the eyeglasses that could allow the convenient control of the input motion on the keys of a remote controller of a home appliance which are all modified with infrared receiving/signal-processing modules. For system evaluation, 12 subjects (4 male, 8 female, 26- 47-years-old) were recruited. Six persons without disabilities were in the control group and 6 with SCI with tetraplegia formed the experimental group. **RESULTS:** The average accuracy of the control group and the experimental group are 88.8 +/- 10.6% and 85.9 +/- 14.3%, respectively. The average time cost of the control group and the experimental group are 57.2 +/- 8.1 sec and 66.6 +/- 12.3 sec, respectively. An independent t-test revealed that the differences in the average accuracy and the average time cost of the control group and the experimental group are not significant ($p > 0.05$). **CONCLUSIONS:** Using the novel home appliance control system not only provided the advantages of convenience, accuracy and sanitation for people with disabilities but it also helped them to live more independently.