"Wand" for the Upper Limbs Limitations: A Voice and Motion Recognition Based Remote Control

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In China, more than 10 million people suffer from physical disabilities, some of who cannot finely control their hands or arms, fail to control TV or air conditioners with remote controller, which makes their lives inconvenient. There are two existing solutions including the voice recognition and the motion recognition. The voice recognition is natural but may be error-triggered and inflexible. The motion recognition more robust but unnatural and coarse. To help the disabilities easily control household appliances, a remote controller based on both voice and motion recognition was designed. The designed remote controller includes a voice module, a motion module and a RF module. These three modules are controlled by an independent MCU, and packaged in a 3D printing housing. The accuracy of voice and motion recognition was tested and 24 people were involved. The accuracy of voice recognition reaches 65%~85% in normal condition indoor (51dB), and the one of motion recognition reaches 95% after 3 time practices. Compared with the existing smart home devices in the market, this controller has two advantages. Firstly, the remote controller is compatible to mainstream appliances. Secondly, the cost of the remote controller cost is very low, which is only 5% average price of the existing smart home control systems. Thus, the designed remote controller will greatly benefit the upper limbs disabilities, especially for those from the lower income family.

Awards Won:
Fourth Award of $500