Voice recognition wheelchair control system using STM32-based system

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***Abstract*—This article introduces a speech recognition wheelchair with STM32-based system to ease the wheelchair user to control their wheelchair through sound module. The voice recognition system is embedded in the control system using STM32. The system will execute the movement of wheelchair based on the command of user. This voice recognition system will ease the people with physical disability where they could not control the wheelchair by his/her own or others help to execute the movement.**

***Index Terms*—microcontroller, embedded systems, edge computing, STM32, speech recognition wireless communication**

I. INTRODUCTION

Voice is the simplest and most straight forward way of conveying command and message by human being. Voice recognition is used in a lot of applications nowadays. Speech recognition system embedded in wheelchair is beneficial to the user so that they could easily control the wheelchair without the help of others or the need to learn to manual control the wheelchair through controlling buttons. Thus, this topic designs to implement a smart voice recognition control system. This could help to ensure the safety of the particular people as well as user is able to monitor and controlling the movement of wheelchair.

II. DESIGN CONCEPT

This system is made up of both hardware and software. The voice signal received by voice recognition module would be processed and sent to the microcontroller. Last but not least, identified signal will be execute through the I/O port.

III. HARDWARE DESIGN OF THE SYSTEM

The diagram shown in Fig 1. is hardware design of the system. STM32 is used as the main control unit. The voice signal is processed through INMP441 and the compatible signal is identified. The identified signal is sent as the output to blink LED with specified pattern.

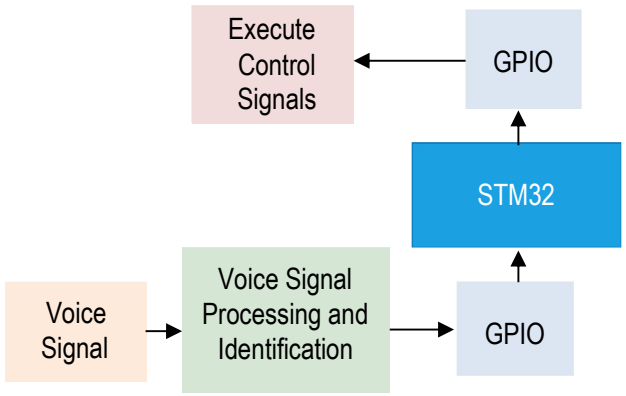

Fig. 1. Design block diagram of the voice recognition wheelchair control system.

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