The Human-Environment Interface Design with a Vision Assistance Module for a Smart Wheelchair

**ABSTRACT**

Automatic and intelligent health care service becomes important with the growth of aged population. To achieve intelligent mobility for a smart wheelchair, we proposed to construct a friendly user-environment interface that users can interact with the living environment like a normal healthy person. An integrated interactive platform, including touch control panel, together with a camera, is embedded on a wheelchair to achieve human interaction. Interaction functions, such as appliance control, semi-automatic vision assistant function, and physiological information monitoring function etc. have been developed to achieve the target. The goal of light mobility can be reached and the overall smart wheelchair system comprises: a mobile vehicle, information sensor modules, analysis control modules and an image capture unit which is set towards the headrest direction of the mobile vehicle to capture human facial image data. The physiological sensor module is used for sensing user physiological data. The analysis control module seamlessly transmits monitoring signals to a caregiver side in response to the physiological data. These user-environment interaction functions are developed under the design target of human technology that the wheelchair user can interact with the environment like a normal person.

**Existing System:**

The Existing paper consists of theoretical explanation of the concept, no embedded hardware or software descriptions have provided. And also there is no clear area of implementation algorithm is proved which can be appended to the practical exposure.

**Proposed System:**

In the proposed system, we are going to implement the concept on a ARM 9 based embedded hardware device, which includes the touch screen in order control the appliances like light, fan and DC motor, a USB Camera will be attached to the Device for human faces detection for vision assistance and Voice output will be provided on heart beat sensor values increase above set threshold and same data will transmitted to the remote location Android Mobile phone using Bluetooth.

**BLOCK DIAGRAM**

**Hardware:**

ARM 9 (Friendly ARM Mini2440), USB CAMERA, Heart Beat Sensor, light, fan, buzzer, DC Motors, Bluetooth

**Software:**

Arm Linux, IDE: Qt Creator, Speech Synthesis

**Applications:**

Elder Monitoring, Wireless Monitoring

**Advantages:**

Easy to operate, Can be used by handicap person.