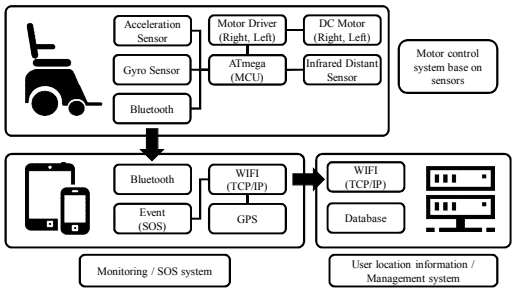
Smart Control Platform Technology for Aging and Disabled Persons Care

Motivation

- ❖ Moderate electric wheelchairs do not include the safety-related functions or safety device, and most of the expensive electric wheelchairs has just shock absorber action installed.
- ❖ Electric wheelchair collisions and rollover need solution to prevent accidents.
- ❖ Request for electric wheelchair instant assistance and help is needed.
- ❖ Therefore, a control platform was developed with social care system that ensure safety and ease of movement of the elderly base on smart sensors and motorized wheelchairs.

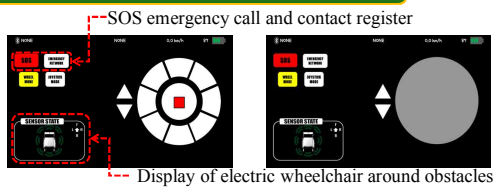
Smart Control Platform System



Full System Configuration

- ❖ This platform has three smart control system modules that helps to users more safe by detecting in real time what happens in an electric wheelchair.

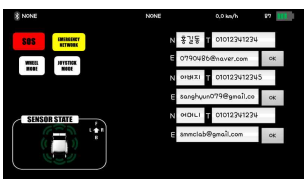
Control Platform Technology



Smart Devices Offer Screen-based Control Platform

- ❖ Smart control platform is connected to the integration control board by using the Bluetooth communications to operate.
- ❖ For movement of the electric wheelchair, it provides buttons and a jog-based interface to the user.
- ❖ The location is displayed when it detects an obstacle while using the electric wheelchair.

User Care System Technology

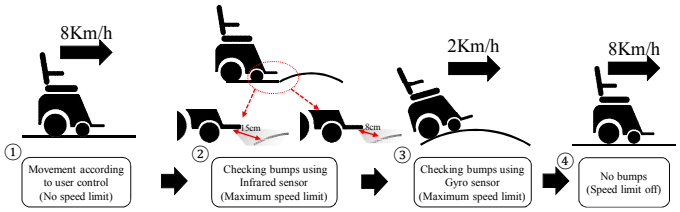


Emergency contact registration screen

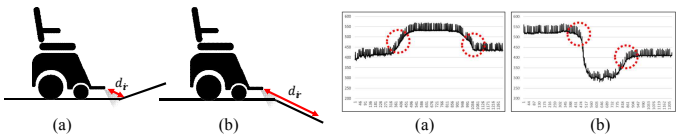
Care System Server

- ❖ When a rollover occurs or user request for help, the user's location and contact information are transmitted via smart mobile devices.
- ❖ The system is developed to store user-specific information on the server to determine the users location with Google map.

Automatic Speed Control System



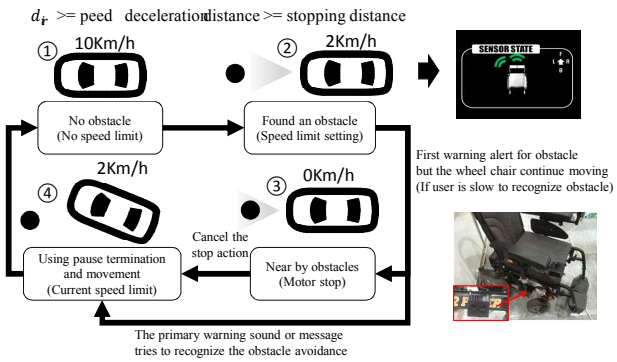
The sequence of operations for the motor control in terrain bumps



Uphill and Downhill Terrain Checked using an Infrared Distance Sensor (a) Uphill Road (b) Downhill Road

- ❖ The system has the ability to reduce the user speed upon detecting terrain bumps.
- ❖ Automatic tilting and rollover protection by controlling the speed of the electric wheelchair in a uphill or downhill terrain.

Obstacle Detection System



Motor speed control system operation procedure based on the obstacle detected

- ❖ The electric wheelchair uses an infrared distance sensor of the integrated control system developed for obstacle detection.
- ❖ The electric wheelchair also has automatic motor control system for 360 ° direction.
- ❖ The smart phone provides the user with a monitoring icon to see the location of the obstacle

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