

SMART WHEELCHAIR WITH AUTOMATIC ROOF

Prepared by: Ee Cheng Ying

ABSTRACT

This project entitled ‘Smart Wheelchair with Automatic Roof’ is able to provide shelter to the rider away from bright sun and rain. It serves as a mean of mobility for the disable whereby he can travel outdoor without the disturbance from the sun shine and rain. The automatic detection system of this roof operates based on the pulling and retracting mechanisms that turn the dc motor in clockwise or counter-clockwise direction. By controlling the turning direction of the motor, the roof will be able to come out or retract back to its original position. Rider may manually slide out or retract the roof at any time by pressing the manual ON or manual off switch. Through the control attached to the arm rest which act like a joystick, the disable can move the wheel chair in omni direction; moving forward, backward, left turning or right turning. The stop function may be useful in case of emergency when sudden halt is necessary. The whole system works on 2 Peripheral Interface Controller (PIC) which are the PIC16F84A for the automatic roof function and PIC 16F877A for the omni-directional movement control of the wheelchair.

The operation of the wheelchair control system is included in the introduction part of the report in which the main control system block diagrams are presented with some brief explanation on their workings. Here, the aims and objectives are highlighted. In the literature review, all the theories applicable are explained. The hardware design, construction, and methodologies are listed and discussed in detail in the hardware and software design, methodologies part. All the factors that have great influence on the choice of materials are discussed to get the programming algorithms, flow charts are enclosed. Proof of the testing and results can be seen in the Testing & Result chapter. The status of the project, its limitations, problem encountered and the solution is listed in the discussion chapter. Lastly, some future improvements are included in the conclusion part.