

Project Report on

STAIR CLIMBER FOR DISABLED

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ABSTRACT

Stairs are one of the most commonly faced mobility challenges for a robot. In the recent days extensive work has been in process for methods of improving the stairclimbing ability of disabled with the help of robot with legs (links) and wheels. The main technical issues in developing this type of robot are the stability, weight handling capacity and speed of the robot while climbing stairs. The robot prototype which we have developed is featured with pair of two wheeled setup in the front and back of the body to support its weight when it moves on different terrains. It also has arms between the wheels to hook onto the tread of stairs while climbing and descending. Using not only the rotational torque of the arms and the wheels, but also the force of the legs, the robot climbs and descends down the stairs. A suspension system is designed on the front end of the prototype which helps it to move and tackle different terrains. Due to this there is no time loss when the prototype is in function. The programming supervision which controls the motion of the robot prototype needs no complicated calculations as other legged robots do. The mechanism of this robot and the control algorithm are programmed completely using Arduino as the work base. Being an open source platform the coding and usage is well defined to easily make a layman understand and control the robot prototype. This robot prototype will be developed as a wheelchair with a stair climbing mechanism for disabled and elderly people in the near future. To add-on to the applications we have used a Dual-tone Multi-frequency module (DTMF) to control the movement of robot prototype using telecommunication signalling. This helps a mentally disabled person to use our prototype as well.

Key Words: *Robot prototype, Arduino, DTMF, Open Source*