

For those with restricted range of motion, the world as it is now is extraordinarily different. Nayak et al. [11] estimate that 650 million individuals worldwide are disabled. The population of disabled people has benefited immensely from technological advancements. Hartman et al. [12] define a wheelchair as a chair with wheels that assists people who have trouble walking independently. Although wheelchairs made it easier for the disabled to move around in the past, they did not, in general, lessen their dependency on carers. Akash et al. [13] state that the objective is to help these people who have physical disabilities gain independence. The track can effectively engage with the stairs when the standard wheels are raised, and the balancing wheel can then be released once the tracks Figure 1.2 : Experimental Demonstration of the Stair Climbing Wheelchair during Climb-down Mode. (a) Motion Initiation, (b) Approaching staircase, (c) Climbing down, (d) Motion Completed Dalsaniya and Gawali [14] employed the voices of the disabled as input, whereas some other techniques made use of GPS locations. Wanluk's wheelchairs [15] employ GPS technology to track their whereabouts and identify obstacles. The wheelchair is completely autonomous and customizable because some of its features adjust based on the user's mood. Compared to the antiquated yet functional wheelchairs that were first introduced, the proposed smart wheelchair represents a labor-saving technological innovation that would enable people with physical disabilities to live independent and satisfying lives. Several academics recently presented a GPS approach that can operate wheelchairs. In this study update, however, we focused on a smart wheelchair that modifies its behavior according to the disabled person's mood and the weather. It is impossible to predict when it will rain or shine. Figure 1.3 : The intelligent robot: Smart Wheel Many people use an intelligent wheelchair vehicle, according to Sivakumar and Sudhagar [17]. The suggested IW system's design is shown in Figure 1.4. It comprises of a general EPW, a laptop, a data acquisition (DAQ) board, a charge-coupled device (CCD) camera, and eight ultrasonic sensors. Through processing of the streaming image obtained from the CCD camera, the user is able to identify impending barriers and the kind of location, so averting collisions with a variety of obstacles at traffic crossings, such as walls, pedestrians, and moving cars. Figure 1.4 : Overall architecture of the proposed IW. Scientists were able to address that difficulty with the aid of the ATmega328 Microcontroller, which shows wheelchair layout and headway organization. Reddy and Kumar [18] proposed the smart wheelchair, which included social media and a phone connected to it for the guardian. Using an accelerometer, an attempt at a GSM/GPRS module, and an RDIF tags microphone system, they provided a description. Figure 1.5: Wheel movement during stair ascending Figure 1.5: An inverted-pendulum-type robotic wheelchair to climb stairs considering dynamic equilibrium