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41 PROJECT COMPACT STANDING MECHANISM FOR THE ELDERLY/ SPECIALLY- ABLED



Sit-to-stand (STS) is a crucial function influencing a person's independence in daily activities, as well as safety and quality of life. People with muscle weakness often require assistance to raise them from a seated position, or to lower them into a seated position in a controlled manner in order to avoid injury.

According to a survey of elderly people at home and nursing care, the main concern is about their weak legs and difficulty to stand up from a chair. Roughly 6% of community-dwelling older adults experience significant difficulties with STS, a major risk factor in institutionalisation. Muscle strength further decreases with age and increases the difficulty to rise from a chair. As a result, there is a need for a standing mechanism so that the specially-abled elderly can be independent as well as boost their confidence level.

On comparing seat, waist and arm assistance modalities in elderly population, the team discovered that the seat and waist assisted modalities were most efficient. Initially, the calculations for selecting the motors with suitable torque and the lead screws were done. Then the kinematic analysis of the links imparting the motions were done. A 3-D CAD model of the design in CATIA was developed and the team performed structural analysis in ANSYS Workbench. From the results obtained, a system was fabricated and tested in real time.