UpLift Mobility: Robotic Lift to Elevate Frequently Falling Individuals

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The author designed and manufactured a robotic lift called “UpLift Mobility”, to elevate frequently falling individuals from the ground, inspired by her grandpa’s increased falls. According to the WHO, after falling, 48% of older people report a fear of falling, and 25% report curtailing activities. Therefore, the major engineering goal was to design an aesthetic and structurally sound robotic lift that an individual could confidently operate without the assistance of a carer. Utilising SolidWorks 3D CAD software, the robotic lift’s versatile self-driving function is complemented by a modern artistic armchair design. The drive base and lift are linked to an Apple watch app, created by the author. Using the Apple watch’s embedded fall detection feature, the app is enabled when a fall is detected. The individual will then be asked whether to call for the robotic lift and/or call for help. The robot navigates toward the user using visual simultaneous localisation mapping technology viewed on the carer mobile app, the author has designed. When approaching the individual, face tracking on the robot’s camera and the Apple watch app joystick finetune the robot’s position and finally lifts the individual off the ground using either a button on the lift or the Apple watch controls. UpLift Mobility requires no external assistance allowing for independent living and confidence, providing a safer method of lifting fallen individuals for carers. It gives family members a sense of security and it is a more dignified way for an individual to get up after a fall.

Awards Won:

Third Award of $1,000

International Council on Systems Engineering - INCOSE: Second Place INCOSE Best Use of System Engineering Award of $800, a 1-year free student membership to INCOSE, and free virtual admission to the 2022 International Symposium of the INCOSE

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