The helpful buddy is an automated system to assist with the elderly´s mobility on stairs. The main aspects of the design are presented. Detailed information highlights how each component contributes to the functionality of the design.

**Drive system**
- Pulley and belt drive system (sprocket and chain on the prototype)
- Sprocket is mounted on a stand with a steel shaft and bushing

**Motor and gearbox**
- Electric motor powers the buddy (prototype – 120 W)
- Inverter to control the output of the motor; speed and direction
- Gear ratio: 1:49 (worm gear)
- Parallel key used to mount sprocket to the gearbox

**Silhouette and frame**
- Welded metal frame and white plastic silhouette
- Ergonomically designed arms with control buttons
- Safety factor for the final product 1.5 (with 400 W motor)

**Control**
- Stopper switches limit the drive of the buddy
- A button on each arm controls the direction of movement

**Background lighting**
- LED strips mounted on the back of the silhouette frame
- 1500 lumens; temperature 3000 K
- 24 V; 20 W in prototype
- White colour

**Railing and rollers**
- Bracket and rollers reduces the degrees of freedom to prevent silhouette turning
- Polymer upper rollers reduce friction and are more silent on contact

**Connections**
- Right angle bracket acts as a support to the frame of the silhouette
- Slots give an extra degree of freedom to the mount to allow adjustment of the frame angle
- Connected via nuts and bolts to the frame

**Motor mount**
- Dimensions: 250 x 160 x 110 mm
- Made out of steel (wood in prototype)