

Aufgabenbeschreibung

Masterarbeit / Studienarbeit/ Bachelorarbeit

Active Supporting Crutches

The Institut für Medizingerätetechnik is investigating a project for active supporting crutches. The most prevalent type of ankle injury among the general public is an ankle sprain. In addition, in Germany, around 200 000 people get a stroke each year; patients are highly likely to need a form of walking aid: crutches, canes, or walkers. Using crutches, canes, or walkers can help patients in keeping the weight off the injured or weak leg, assist in balance, and carry on their daily tasks more safely. However, it is difficult to get accustomed to using a walking aid as additional help is needed to be able to be steady. This project is focused on presenting active supporting crutches that are equipped with an actuator on the bottom so that they not only prevent falling forward or backward, but also help patients gain their confidence quickly and use the walking aid safely.

Below there are some walking aids:



Fig.1. iWalk3.0 Hands-Free Crutch



Fig.2. M+D Pain-Free Crutches

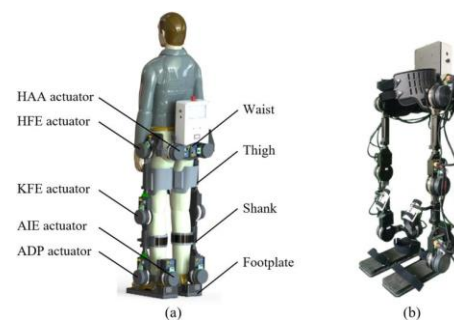


Fig.3. 10 degree-of-freedom lower extremity exoskeleton for crutch-less walking rehabilitation

Below you will find the aim of your thesis:

- to model and characterize the active supporting crutches actuation.
- to design and conceptualize the mechanics and electronics integration.
- to evaluate and test the active supporting crutches.

The following requirements would be ideal for the prospective student:

- basic knowledge in programming microcontrollers
- basic knowledge of CAD (Creo Parametric preferably)
- basic knowledge of manufacturing processes and mechatronics

Supervision will be provided in English. Hence, the thesis should be written in English.

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