

The FLOAT gait therapy: a safe support system for training of everyday challenges

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Background

Current robotic gait therapy allows highly intensive training within a safe setting for patients. Nevertheless, most robotic devices restrict therapy to single training tasks such as treadmill or over-ground walking and are unable to address the variety of challenges encountered by patients during daily life.

Conclusion

The new training modes for the FLOAT open up challenging trainings of daily walking activities for patients with movement disorders. This has the potential to advance robotic gait therapy to a new level.

Methods: Controllers for physiological gait patterns in the FLOAT



Body-weight supported gait training in 4D with the FLOAT

Training of everyday walking activities requires unrestricted movement in 4 dimensions (forward-backward, left-right, up-down, rotation around longitudinal body axis). A recently developed gait therapy robot, "the FLOAT", is capable of providing freedom of movement while simultaneously supplying body-weight support and keeping the patient from falling [1].

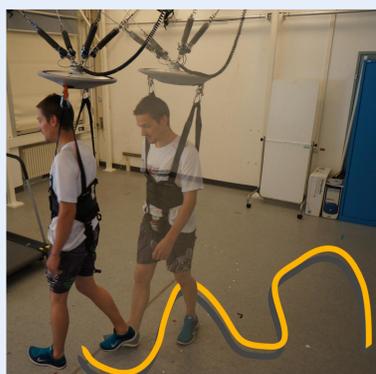
The controllers that will provide the necessary support through the FLOAT are designed to promote physiological gait patterns. They will be based on:

- Optical motion tracking
- Gait analysis
- Guidance enabled by potential fields

Goals: Training of everyday challenges



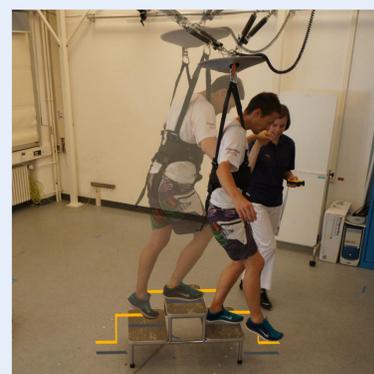
Standing-up / sitting-down



Arbitrary path walking



Balance training



Stair climbing



Stumbling

- Maximized challenge while training in a safe environment
- Adapted body-weight support according to the patient's needs
- Support/resistance in movement direction can be provided during all training modes

References

[1] [Vallery et al., 2013] Vallery, H., Lutz, P., Von Zitzewitz, J., Rauter, G., Fritschi, M., Everarts, C., Ronsse, R., Curt, A., and Bolliger, M. (2013). Multidirectional transparent support for overground gait training. In Rehabilitation Robotics (ICORR), 2013 IEEE International Conference on, pages 1–7. IEEE.



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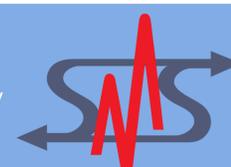


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