VRGait: An Immersive Virtual Reality System for Gait-Specific Neurorehabilitation and Therapy

Marc Erich Latoschik, Franz Weilbach, Negin Hamzeheinejad, Dominik Gall

Introduction

Neurological injuries can have an impact on the patients' mobility. Motor function can be repaired by repetitive exercises.

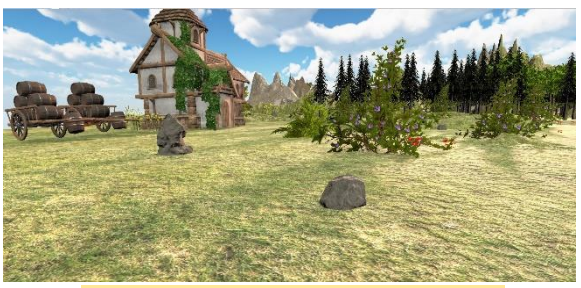
Problem

- Therapy equipment restricts users and has less attractive environment.
- Current equipment does not exploit the potential of adaptive training stimuli based on movement mimicry.

Approach

- Increased motivation from inspiring walking escapes (beach or mountain scenes) and gamified tasks.
- Exploiting motor mimicry caused by their controlled virtual avatars or counterparts walking together with them.

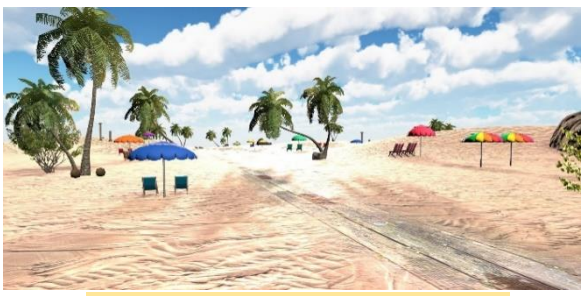
System Overview



Grassland Landscape

Forest Landscape

Waterfall Landscape



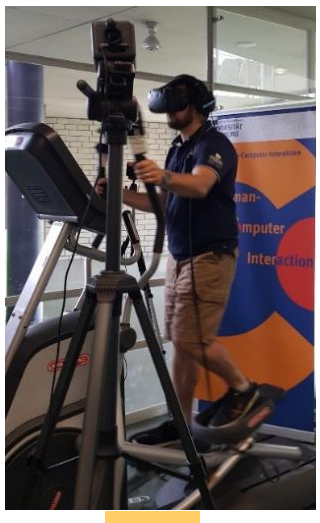
Beach Landscape

Methods and Materials

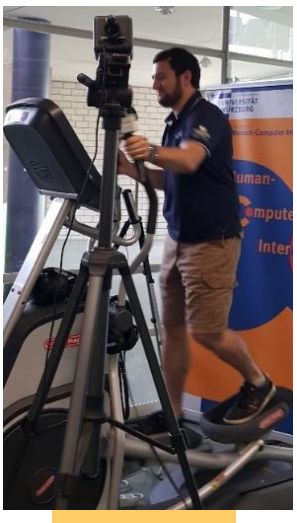
Design

- **Hardware:** HTC Vive, HMD Headset
- **Software:** Unity 3D V5.6
- **Task:** Participants walk 2 minutes on the cross-trainer

Independent Variables



VR



Non VR

Dependent Variables

Task Load, Simulator Sickness, Intrinsic Motivation, User Experience, Affectivity, Qualitative Questions

Preliminary Result

21 participants (11 female, 10 male)
Age: M= 24.19, SD= 4.38

Measure	P
Attractiveness	<.05
Stimulation	<.05
Novelty	<.05
Mental Demand	<.05
Dependability	<.05
Positive	<.05

(Table 1:Significant difference in VR and Non VR)

Conclusion

VR Gait system has a positive effect on the users and increases the motivation of them.