

Internship/Master Thesis: Body Tracking for Interactions in Virtual Reality

Job description

For a new research project in the field of physical rehabilitation, VECURY-Digital Motor Rehabilitation Project is supported by the Ministry of Economic Affairs, Innovation, Digitalization and Energy of the State NRW, Germany.

We investigate how virtual reality (VR), in combination with 3D motion tracking, can support patients and therapists during physical rehabilitation. The approach focuses on providing patients with individualized guidance during exercise routines while allowing therapists to design customizable training plans and receive objective data on the recovery progress. We develop an innovative VR platform designed for the use of patients with musculoskeletal disorders of the upper-limbs. The project will be carried out in close cooperation of major medical institutes in the area.

You are expected to implement and evaluate multi-sensor fusion state-of-the-art algorithms to power body tracking applications. The approach focuses on using motion capture devices to accurately track body movements of the user and to allow natural interaction within a virtual environment. Furthermore, you are expected to integrate motion tracking with a Head-mounted display (HMD) device to provide 3D immersion and presence to the user. The project will provide insights into different sensor fusion and body tracking solutions using both optimization and machine learning algorithms, while users are interacting in HMD environments. Focusing on the Unity game engine, scenes for benchmarking the performance will be implemented. The benchmarks will be evaluated in a setup mainly based on the Azure Kinect and the HTC VIVE Pro at Bielefeld University. The project is carried out part-time with flexible weekly working hours.

Profile

- Interest and first experience interest in motion tracking applications in VR
- Strong background in mathematics and/or physics.
- Familiarity with computer vision and computer graphics
- Experience with C++ and/or C#, experience with previous multi-sensor fusion, motion tracking algorithms and technologies is a plus.
- Prior experience with VR headsets, Unity or Unreal Engine platforms is a plus as well.

Research Group

Neurocognition and Action – Biomechanics

For more information about VECURY

https://www.uni-bielefeld.de/sport/arbeitsbereiche/ab_ii/research/vecury.html

<https://vecury.com/>

Place

Bielefeld, Germany

Starting date

To be agreed

Duration

According to study regulations, interns are encouraged to stay with us for at least 3 months. Flexible working time. Internship + Master Thesis is possible and preferred.

Application

Please send an email (including CV) to alessio.daquino@uni-bielefeld.de