Open Master thesis

Real-Time Garment Manipulation Simulation using Unity

In an era where sustainability and technological innovation intersect, the fashion industry stands at a pivotal juncture. The cycle of consumption and disposal has led to an urgent call for sustainable practices, particularly in garment production and lifecycle management. To reduce the need of human labor, automated garment sorting and recycling machines have been developed. However, automated sorting of garments remains a difficult task, as many parameters determine the re-useability or recyclability of garments. Using simulation may help reduce effort during development. One of these open research questions is to simulate the garment behavior and handling in such simulation frameworks. This Master's thesis aims to explore and develop a real-time garment manipulation simulation within the Unity game engine.

In this project, you will be investigating the simulation of textiles, such as studying the behavior under movement, dropping, and grasping with robots. Additionally, the ability to add additional garments to a running scene should be implemented.

All further details can be discussed in a personal meeting.

These are your tasks:

1) Get familiar with simulation modalities of textiles in Unity
2) Model a representative scene with various garments & robots
3) Benchmark your results with real world experiments and other scientific works
4) Document your findings

Your requirements:

- Good knowledge in mathematics and physics
- Creativity and analytical reasoning, organizational talent
- Self-driven motivation to investigate new topics
- Experience in Unity

Nice to have's:

- Experience in ROS and/or ROS2

Time period and contact information:

Duration: about 6 months, Start: as soon as possible
Contact: Dipl.-Ing. Dr. Hubert Zangl (hubert.zangl@aau.at),
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We offer funding and publication possibilities!