



Aufgabenstellung „Projekt Anwendungsforschung“

Aufgabe: Immersive Rigging and Skinning in Virtual Reality Environments

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Fokus und Ablauf des Projekts:

The animation of 3d models through rigging and skinning usually involves sophisticated algorithms for fitting skeletons into meshes and motion capturing to gather realistic movement data. Immersed in a VR environment the user finds himself in a familiar coordinate space, where working with 3d models seems more intuitive. Therefore, an application allowing the interactive creation and manipulation of a skeleton in 3d space should be developed. This skeleton shall be used to skin a mesh. Further the approach shall use the tracking information of the VR headset, controllers and trackers to animate the skinned mesh.

Aufgaben:

- Literature research on motion capturing with VIVE trackers or VR in general
- Implementation of a basic user interface in VR to control core functionalities
- Development of a system to create and manipulate bones of a rigging skeleton
- Skinning of a mesh with the created skeleton, possibly by using an external tool
- Using inverse kinematics through cyclic coordinate descend to determine bone rotation angles, so that the skeleton follows the users movement given by the VR trackables
- Visualizing the skinned mesh inside the VR environment
- Evaluation of the quality and stability of the implemented motion capturing scheme

Optional:

- Recording, saving and loading of animations created by the users movement
- Creating multiple views, like a mirror image, of the skinned mesh, which can be seen in VR
- Optimization of the implemented cyclic coordinate descend algorithm or usage of another approach for inverse kinematics to improve stability

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