TECHNISCHE UNIVERSITÄT DRESDEN

Computergraphik und Visualisierung

Fakultät Informatik – Institut SMT – Professur Computergraphik und Visualisierung

Aufgabenstellung „Projekt Anwendungsforschung“

Aufgabe: Immersive Rigging and Skinning in Virtual Reality Environments

Name:	Zhongyuan Yu		
Studiengang:	Diplom Informatik	Matrikel-Nr.:	#######
Beginn am:	--.--.2020	Abschluss am:	--.--.2020
Betreuer:	David Groß		
Verantwortlicher Hochschullehrer:	Prof. Dr. Stefan Gumhold		

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:

- 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

_____ _____

Unterschrift des Studenten Unterschrift des Hochschullehrers

Verteiler: 1 x Prüfungsamt, 1x HSL, 1x Betreuer, 1x Student