



Skeleton-rigging for an interactive medical teaching system

Project Management and Software Development
for Medical Applications

General Info

Project Title: **Skeleton-rigging for an interactive medical teaching system**

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Project Abstract

The goal of this thesis is to implement a skeleton animation for an augmented reality magic mirror.

Background and Motivation

We have previously shown an augmented reality (AR) magic mirror. It creates the illusion that a user standing in front of the system can look inside the own body. We now want to build a system for education of human anatomy using augmented reality visualization.

The system uses the Kinect which tracks a user and provides us with the skeleton joint. A CT dataset is augmented onto the user. One problem here is that the CT dataset is rigid. So if the user moves the arm, the overlay will not be correct. We want to use a polygonal model instead of the CT. The goal of this project is to animate a computer model based on the joint we receive from the Kinect. In order to do that, the polygonal model has to be processed such that an animation of the skeleton becomes possible.

Student's Tasks Description

Extract bones from a 3D polygonal model of human anatomy. Implement a so called rigging, where the skeleton is moved based on data obtained from the Kinect.

Technical Prerequisites

The students should have basic knowledge in C++ or C# and OpenGL or DirectX.

Administrative Info

Working Time: **100h**

Project Location: **Garching**

Required Equipment: **a Kinect will be provided**

Timeline and Milestones

Week 2: Literature research on existing software libraries for rigging

Week 5: Extraction of the skeleton from a polygonal dataset

Week 10: Implementation of the basic framework for rigging

Week 15: Presentation of a tested and bug-free version of the framework

References

mirracle: An Augmented Reality Magic Mirror System for Anatomy Education. T Blum, V Kleeberger, C Bichlmeier, N Navab. VR 2012

Please send the completed document to us (Ralf.stauder@tum.de) before the project proposal deadline, **September 30th**. Please note that this proposal will be evaluated by the BMC coordinators and will be assigned to a student only in the case of acceptance.