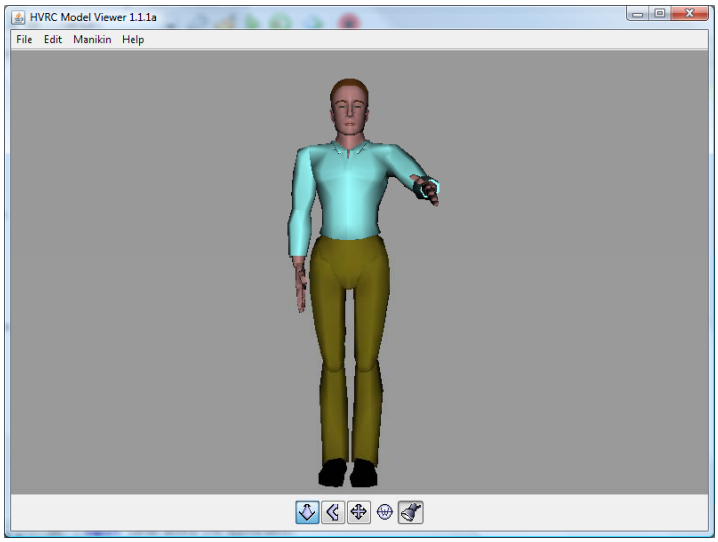
The King Of Manikins!

An Interactive Virtual Manikin - 7 DOF Kinematics Algorithm



The King Of Manikins' project aims at calculating the movements and transformations of virtual manikins and robots. This project is based on The theory of Inverse Kinematics and CollitionDetection[3] . The King of Manikins' project is divided into the following tasks:

Design an IK algorithm that is suitable for using with a seven-DOF[4] in a H-ANIM character.

Construct a module implemented in JAVA3D which uses Inverse Kinematics to calculate the movement of virtual manikins, and also physical and virtual robots.

Design a simulating tool in JAVA3D for the robot laboratory at the department of Informatics and Computer Science which makes use of the module in the previous task.

Creating a document which contains the central topic and theory in the master degree project.

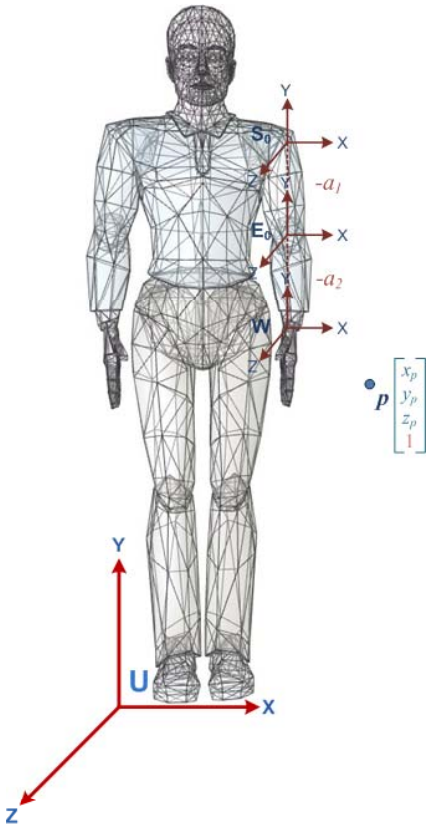
Project Details:

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The Applications are implemented in *NetBeans 6* with Java 6 , *Java3D API 1.5 , SciDelik, H|ANIM and VRML*

The King of Manikins' project is a collaboration between HIOF[1] and IFE[2] .

IFE employs virtual manikins in their simulations of nuclear reactors. To calculate and make the movement of these manikins more natural and precise, kinematics theory and in particular Inverse Kinematics can be used. With the aid of this theory, we can for instance, calculate Shoulder- or Wrist joint angles, when for example the arm will grip an object.

The Faculty of Informatics and Computer Science at HIOF has a robot laboratory which contains both mobile and stationary robots. The department is interested in the implementation of solutions, which can be used as the base environment to simulate and visualize physical robots and human as virtual manikins.



[1] HIOF - Høgskolen i Østfold : Ostfold University College
[2] IFE - Institute for Energy Technology. IFE is the research institute for energy and nuclear technology in Norway.
[3] Collision Detection - The ability of virtual robots and manikins to detect objects around them and nonetheless, different part of them self too. For instance, without collision-detection, The hand of the manikin will go through the object it will grab, and have a "ghosty" effect!
[4] DOF - **D**egree **O**f **F**reedom. An example: I have limited the size of DOF by maximum of 7 DOF for human arm { Shoulder(3), Elbow(1), and Wrist(3) }