Exercise 1

Assignment 1.0: Preparation

Download the folder `Exercise1` into your `Applications` directory. In addition download the file `p26.off` to the `Applications/Media` folder. Make sure, the program `Exercise1` compiles and runs onto your system. You should see a viewer window with an antique Boeing P26 inside. You should be able to rotate the model with the mouse and the right button down.

Now make familiar with the code and note some important changes to the version before:

- Structure **`RObject`** represents a rigid model with its 4x4 model matrix (rotation and translation)
- Structure **`Keyframe`** represents the object state for a specified time frame
- A vector **`animation`** holding all the predefined keyframes
- **`unsigned int frame`**: The current frame
- The method stump **`interpolateTransformation(…)`** where two timeframes has to be interpolated
- In the **`idle()`** method: rigid movement for the object is handled here

Assignment 1.1: Time movement

To make things move we have to advance the time from frame to frame. Implement this functionality in the method **`idle()`**.

Assignment 1.2: Linear Interpolation of Rigid transformation

In this Assignment you have to interpolate the state of the object with the given timeframes. In order to do this, you have to find the two neighboring keyframes, calculate **`u`** (the fractional part between *Keyframe_i* and *Keyframe_(i+1)*) and finally interpolate the translation and the rotation. To interpolate the translation use linear interpolation between the two neighbouring keyframes. For interpolating the rotation, use the fixed angles approach discussed in the lecture.

Challenge (bonus points): Flight Simulation

In this extra assignment you should implement simple user interface for left/right/up/down-movement by capturing four keys of the keyboard. To move the airplane accordingly now use euler angles instead of fixed angles.

Good Luck!