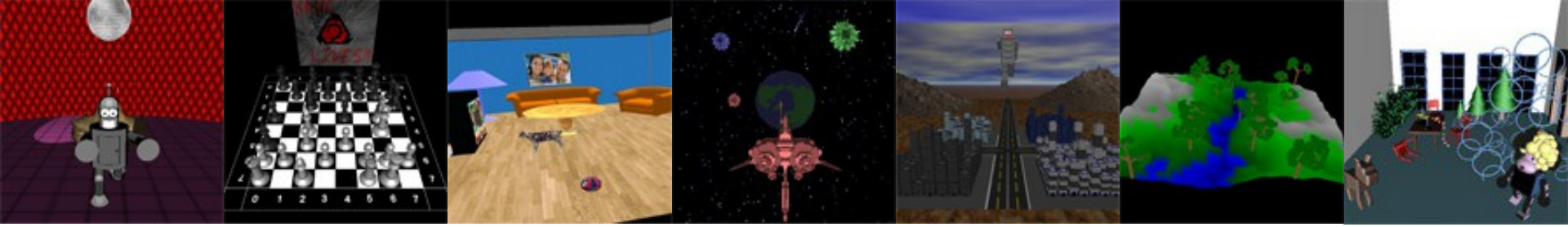

Computergrafik

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Herbst 2012

Exercises

- Programming assigments **every two weeks**
  - 6 in total, 10 points max each
- Theoretical assignments to be announced
  - 2 in total, 10 points max each

- **60 points in total required for the exam (=75%)**

Programming Projects

- Use ExWi pool or your own computer
- Need support of OpenGL 3.2 or later
  - Update your graphics driver!
- Older Intel integrated graphics processors do not currently support OpenGL 3.2!

Programming Projects

- Assignments and schedule on Ilias
- Java base code and documentation on Ilias
- Turn-in electronically on Ilias and demonstration to TA in ExWi pool
- Timeslot reservation for demonstration available on illias
  - Takes usually place every 2nd Thursday afternoon

Project 1

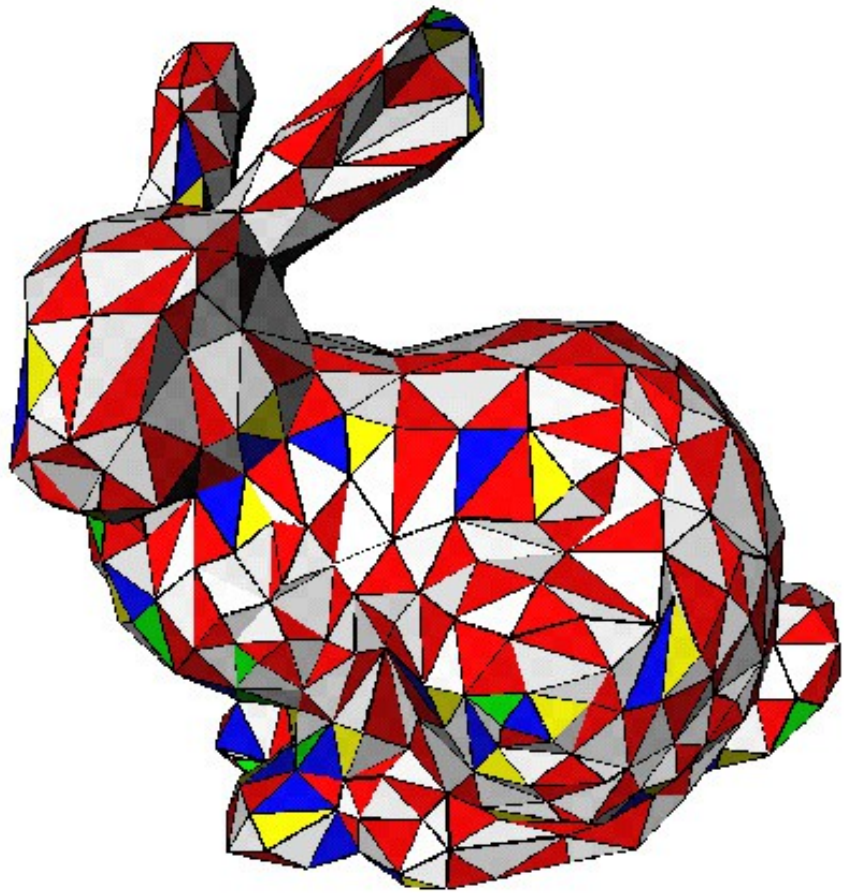
- Description available on ilias
- Electronical turn-in until **Thurstday October 4th on 12:00**
- Demonstration on same day between **12:30 and 16:00 in ExWi pool**
  - Don‘t forget to reserve a timeslot on illias under „*Sign up for Homework Presentation*”
  - No more than 2 people per timeslot!
  - Extra Timeslots on Friday 5th october are also available!

Project 1

- Topics
  - Base code
  - Triangle meshes
  - Constructing cylinders and spheres
  - Concatenating trasformations

Triangle meshes

- Data structure
  - Array of xyz vertex positions
  - Array of vertex indices
- Front and back facing triangles

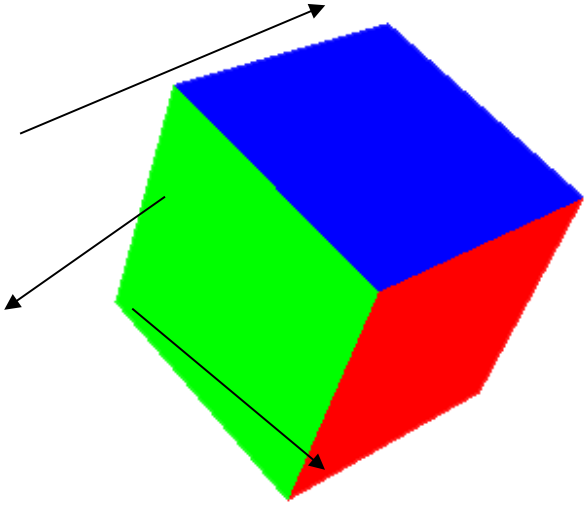


Triangle meshes

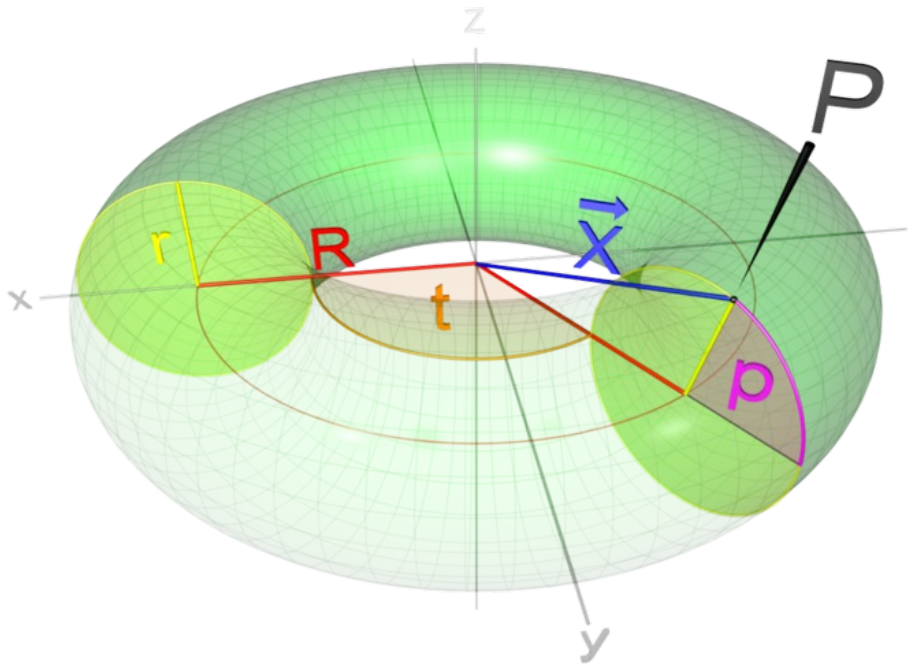
```
// The vertex positions of the cube
float v[] = {-1,-1,1, 1,-1,1, 1,1,1, -1,1,1,   // front face
             -1,-1,-1, -1,-1,1, -1,1,1, -1,1,-1,    // left face
          1,-1,-1,-1,-1,-1, -1,1,-1, 1,1,-1,     // back face
          1,-1,1, 1,-1,-1, 1,1,-1, 1,1,1,  // right face
          1,1,1, 1,1,-1, -1,1,-1, -1,1,1,  // top face
          -1,-1,1, -1,-1,-1, 1,-1,-1, 1,-1,1};   // bottom face

float c[] = {1,0,0, 1,0,0, 1,0,0, 1,0,0,       // The R,G,B vertex colors
          0,1,0, 0,1,0, 0,1,0, 0,1,0,
          1,0,0, 1,0,0, 1,0,0, 1,0,0,
          0,1,0, 0,1,0, 0,1,0, 0,1,0,
          0,0,1, 0,0,1, 0,0,1, 0,0,1,
          0,0,1, 0,0,1, 0,0,1, 0,0,1};

// The triangles (three vertex indices for each triangle)
int indices[] = {0,2,3, 0,1,2,              // front face
              4,6,7, 4,5,6,           // left face
              8,10,11, 8,9,10,              // back face
                 12,14,15, 12,13,14,       // right face
                 16,18,19, 16,17,18,       // top face
                 20,22,23, 20,21,22};            // bottom face
```



Constructing a torus



$$x(t,p) = (R + r\cos p)\cos(t)$$
$$y(t,p) = (R + r\cos p)\sin(t)$$
$$z(t,p) = r\sin(p)$$

http://de.wikipedia.org/wiki/Torus

Concatenating transformations

- Intuitive, math next time
- Example: Motion of object that rotates around some fixed point, while rotating around its center simultaneously