Computer Graphics

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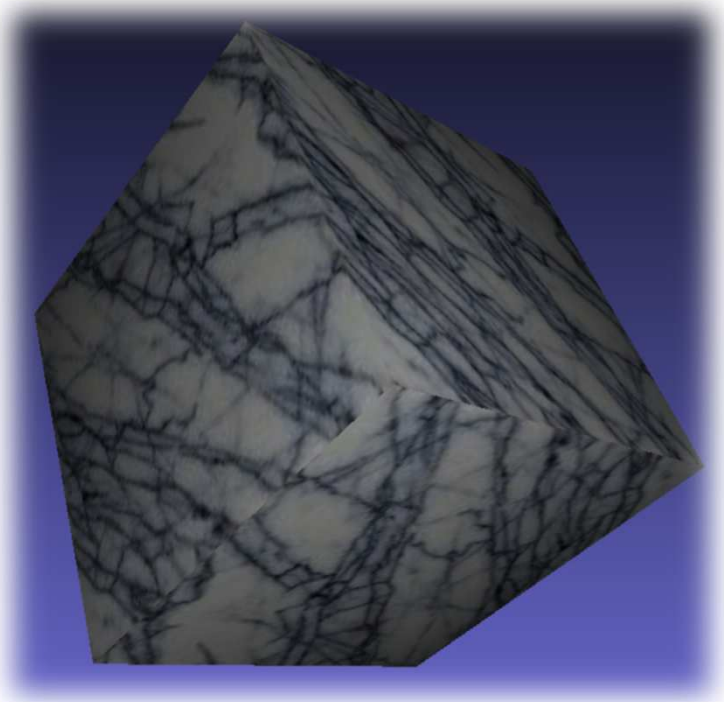
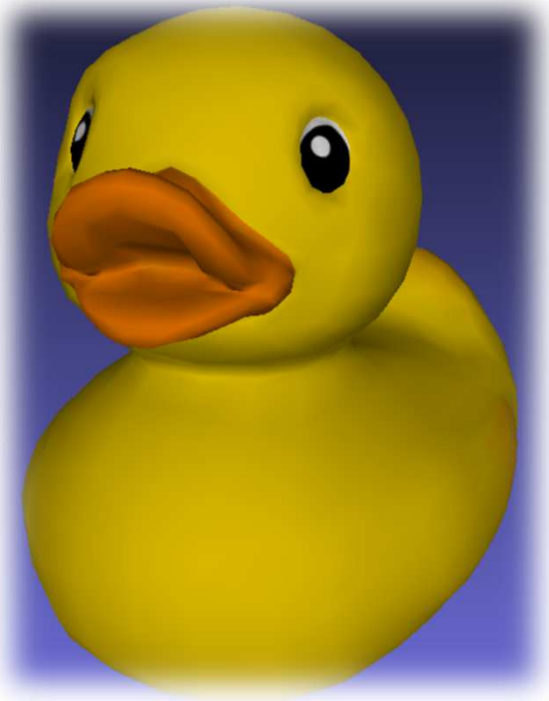
ICL/ITRI

Assignment #3

Draw some 3D models with Textures and Lighting





Purpose of the assignment

- **Know how to add textures on 3D models**
- **Know how to apply lighting on a textured 3D model**
- **Know how to apply texture filter and see the difference between different filtering modes**
- **Know how to apply texture transform for some specific textured models**

Requirement

- You are required to write a program that can accept 3D test models as in previous assignments
- The models should be rendered with provided textures
  - The provided model will contain each vertex's position, normal, and texture coordinate

Requirement

- The texture mapping results should be combine with the lighting results from assignment #2
  - Use a modulation function to combine texture and lighting effect
- Run time modification to different texture filtering mode is required
  - Texture mipmapping is required
  - Demonstrate the filtering effects when the model size is change (zoom in or zoom out)

Requirement

- Transformation such as model transformation and viewing transformation in assignment #1 are required to check the texture mapping effect on the 3D models
- Texture transform on some Pokemon models' eyes to animate the facial emotion

Hint

- How to make sure the texture filtering works as expected
  - Use a small texture for magnification filtering check
  - Use a large texture for minification filtering check
  - Use regular patterns so that you can easily find the difference between various filtering modes
    - Replace the texture image by the one you would like to verified. E.g., a checkerboard texture image.

Input Model Format

- Wavefront 3D Graphics model description file with extension .obj
- The input model contains not only the vertex position information (“v”), but also the normal information (“vn”) for lighting calculation, and the texture coordinates (“vt”) for texture mapping

Due Date

- Two weeks after the assignment is announced, should be 6/9
- Late submission is allowed with less score
- No score if you don't submit you assignment
- If you copy from others, your score will become zero or be down-graded

Final Reminder

- All the late submissions should be received by FTP & iLMS no later than 11:59pm on 6/30
- The final grade will be submitted to the grading system no later than 7/7
- For those graduating students, if you would like to receive your grade earlier, then you will have to follow the following instructions
  - Submit all your homework assignments before 11:59pm on 6/16; and
  - Send an email (with your student ID and name) to me and TAs for requesting an early grade submission (again, no later than 11:59pm on 6/16)
    - I will reply you an acknowledgement to confirm your request

Final Reminder

- We will have class on 5/26, 6/2, 6/9, 6/16 , and 6/23
  - If you are still interested in other topics of Computer Graphics
  - We still have the following topics to go
    - Shader in depth
    - Shadow generation
    - 3D Modeling
    - Anti-aliasing
    - Global illumination
    - Non-photorealistic rendering
    - Animation
    - …

Q&A