

Faculty of Mathematics and Physics
Charles University in Prague
24th March 2015 / 31th March 2015



OpenGL 3.3 Unleashed!

HW for Computer Graphics

Workshop 3 – OpenGL 3.3 Tutorial – Part 3

Workshop 3

Outline

1. Workshop Terms
2. *Resources* (permanent slide)
3. Assignments



Workshop Terms

Score-based Grading

Workshop Number	Tuesdays [C.ODD]					In-time bonus
	Topic	Assignment	Scoring	Bonus deadline		
1	24.2.2015 OpenGL 3.3 Tutorial 1	Sierpinsky Triangle	4	9.3.2015 23:59	2	
		Animated S. Triangle	5	9.3.2015 23:59	2	
		Cube Madness	6	9.3.2015 23:59	2	
2	10.3.2015 OpenGL 3.3 Tutorial 2	Camera Rotation	5	23.3.2015 23:59	2	
		Standard Shading	5	23.3.2015 23:59	2	
		Light Adjustments	5	23.3.2015 23:59	2	
		Model Animation	5	23.3.2015 23:59	2	
3	24.3.2015 OpenGL 3.3 Tutorial 3	Textured Cube	5	6.3.2015 23:59	2	
		VBO Indexing	10	6.3.2015 23:59	2	
4	7.4.2015					
5	21.4.2015					
6	5.5.2015					
7	19.5.2015					
SUM			50		18	
Total workshops	7					
Max Practice Score	68					

Check the full version [HERE!](#)

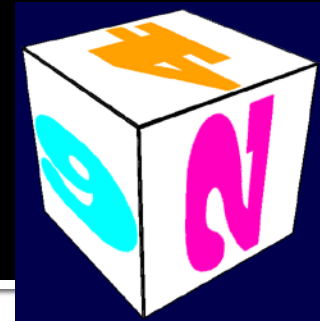
Resources

Permanent Slide

- Lectures web
 - <http://cgg.mff.cuni.cz/~pepca/lectures/npgro19.current.cz.php>
- Workshops web
 - http://pogamut.cuni.cz/pogamut-devel/doku.php?id=hardware_for_computer_graphics_2014-15_summer_term
- OpenGL 3.3 Tutorials
 - <http://www.opengl-tutorial.org/>
- OpenGL 3.3 Reference
 - <https://www.opengl.org/sdk/docs/man3/>
- GLSL 3.3 Specification
 - <https://www.opengl.org/registry/doc/GLSLangSpec.3.30.6.pdf>
- OpenGL Superbible Book
 - <http://www.openglsuperbible.com/>
 - <http://www.openglsuperbible.com/previous-editions/>

Assignment 03.1

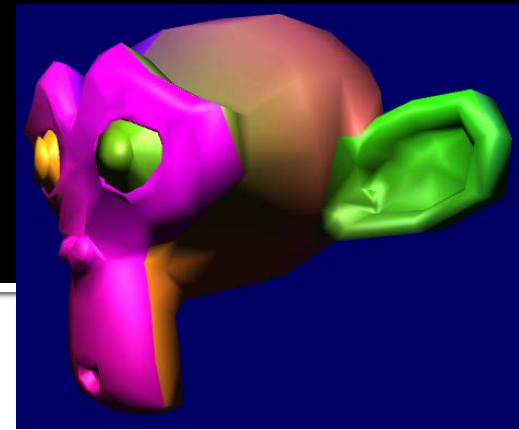
Textured Cube



1. Follow the tutorial 5
 - <http://www.opengl-tutorial.org/>
2. Use Tutorial 5 code as your base and:
 - Provide camera movement (free one will be sufficient)
 - Prepare textures with various combinations for magnifying / minifying (use uvtemplate.bmp)
 - GL_NEAREST / GL_NEAREST
 - GL_LINEAR / GL_LINEAR
 - GL_LINEAR / GL_NEAREST_MIPMAP_NEAREST
 - GL_LINEAR / GL_LINEAR_MIPMAP_NEAREST
 - GL_LINEAR / GL_NEAREST_MIPMAP_LINEAR
 - GL_LINEAR / GL_LINEAR_MIPMAP_LINEAR
 - Swap between different textures them during runtime using "T"
 - Start with random 50 cubes ... Add possibility to add/remove another 50 cubes (via +/-)
 - Does it make difference for the performance?
 - Bonus: try to pull out anisotropic filtering (+4 bonus points)
 - 5 (+2 for time +4 for anisotropic filtering) points

Assignment 03.2

VBO Indexing



1. Follow the tutorial 9
 - <http://www.opengl-tutorial.org/>
2. Use Tutorial 9 code as your base and:
 - Experiment with several methods how to draw 100 heads (different location/rotation/scale)
 - Add the code for old “non VBO indexed” drawing
 - Render them using multiple `glDrawElements()` calls
 - See `glDrawElementsInstanced()` and use it as a single draw call (you will have to prepare array of matrices for that!)
 - <http://stackoverflow.com/questions/21539234/how-to-do-instancing-the-right-way-in-opengl>
 - Provide way for switching between multiple drawing styles (“D” key)
 - 10 (+2) points

Assignment 03.x

Send me an email!

- Email: gemrot@gamedev.cuni.cz
- Subject: **HWGR – 2015 – Assignment 03.1 / 03.2**
 - Or preferably submit all assignments as a single zip under subject **HWGR – 2015 – Assignment 03**
- Content:
 - Assignment code (zipped tutorial project folder)
 - Screenshot(s)
 - *If you have trouble sending zip with "executable", just rename x.zip into x.zi_;-) to fool the almighty Google*
- Award:
 - Up to 15 (+ 4) points
 - Use correct email subject or face -2 penalty per mail!

Questions?

I sense a soul in search of answers...

- Sadly, I'm far from OpenGL-experienced-guy
- But I will try to help you with any serious problem you might encounter during the workshops so don't hesitate to contact me!
 - Jakub Gemrot
 - gemrot@gamedev.cuni.cz