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Degree program: Artificial Intelligence and Robotics

SAPIENZA
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HOMEWORK №1
Proof of originality

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Cloud storage containing the solution: https://yadi.sk/d/szn3cptgBZW2cw

Teacher: SCHAERF, Marco

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< index.HTML >

Lines 3 – 57. Declaring of buttons and sliders for regulation of the model's parameters at the screen. Structure of these buttons was taken from the work of one of students of previous years, but adapted by myself for my own needs: grouping and dividing all parameters to paragraphs, changing values and ranges of these values. I deleted buttons which I didn't need (Rotation controllers, Switching btw projections) and added buttons which I need to control the data of model view according to the exercise (VIEW PARAMETERS group. Source: the book of Professor Angel, 7th edition, paragraph 5.4 "Parallel projections", page 243).

Lines 61 – 66, 76 – 82. Source: the book of Professor Angel, 7th edition, Chapter 6 "Lighting and shading", page 312.

Line 79 is modified by myself with respect to the book's example by multiplication to ModelView matrix variable, because I wanted to avoid the error, which is described here (https://piazza.com/class/jo2z8x9xiadj?cid=23).

Lines 68 – 74, 83 – 110, 154 – 159, 178 – 202 are computed according examples of the book of Professor Angel, 7th edition, Chapter 7 "Discrete techniques", page 338 and an example from the Professor Angel's site: https://www.cs.unm.edu/~angel/BOOK/INTERACTIVE_COMPUTER_GRAPHICS/SEVENTH_EDITION/CODE/07/textureCubev2.html

Lines 116 – 121, 127 – 138, 145 – 152, 161 – 176, 205 – 207 are taken from the book of Professor Angel, 7th edition, Chapter 6 "Lighting and shading", page 308.

Lines 123 – 125, 139, 204, 217 – 223 are modified according to the example: https://www.cs.unm.edu/~angel/BOOK/INTERACTIVE_COMPUTER_GRAPHICS/SEVENTH_EDITION/CODE/07/textureCubev2.html

Difference in Phong and Gourand lighting models is only that the Phong's one provides calculations per fragment, when at the Gourand's model all calculations of light are done per vertex.

Lines 227 – 237 were predefined, but I adapted the canvas' size to avoid scrolling the browser's page every time after reboots and changes of some sliders or buttons input data.

< homework1.js >

Lines 1 – 8, 38 – 41, 59 – 79, 130 – 137, 161 – 177 were predefined.

Lines 12 – 32, 81 – 86. Installing of an image for texture mapping from the example: https://www.cs.unm.edu/~angel/BOOK/INTERACTIVE_COMPUTER_GRAPHICS/SEVENTH_EDITION/CODE/07/textureCubev2.js

Lines 35 – 36, 178 – 179. Initializing of 2 programs by splitting of predefined one from the task example. This way was executed after oral consultations with my groupmates.

Lines 42 – 43 were executed with respect to examples in the book and examples from the Professor Angel's site.

Lines 45 – 55. Initialization of sliders with respect to data given through *.html interface.

Line 57, 139 – 142. Initialization of the shading button, changing of the button's mask.

Line 88. Defines the switching condition as Gourand lighting model as initial state.

Lines 92 – 128. Combining pages 302 (Light) + 354 (Texture) from the book of Professor Angel, 7th edition + example of the cube: https://www.cs.unm.edu/~angel/BOOK/INTERACTIVE_COMPUTER_GRAPHICS/SEVENTH_EDITION/CODE/07/textureCubev2.js

Line 144. Taken from the textureCubev2.js, but I played with numbers and decided to change initial position to [0,0,0] to let the system of camera rotation to be controlled only by the ModelView matrix related sliders.

Lines 146 – 159. Initializing configureTexture() function w.r.t. the example: https://www.cs.unm.edu/~angel/BOOK/INTERACTIVE_COMPUTER_GRAPHICS/SEVENTH_EDITION/CODE/07/textureCubev2.js

Lines 181 – 205. Predefined, but I wrote a double division of "vColor" and "vPosition" for using in separate programs.

Lines 207 – 216. Added with respect to the example: https://www.cs.unm.edu/~angel/BOOK/INTERACTIVE_COMPUTER_GRAPHICS/SEVENTH_EDITION/CODE/07/textureCubev2.js . But also after unified defining of "tBuffer" for the texture I divided "vTexCoords" to 2 parts – for Phong and Gourand models.

Lines 221 – 226. Checking of the current shading button mask (w.r.t. to this example https://realadmin.ru/coding/onclick-js.html and consultations with colleagues).

Lines 228 – 242. Usual taking of data about sliders inputs from the *.html file as it was in the line 163, for example.

Lines 247 – 275. Inside of the render() function in to divide the canvas into 2 parts I decided to use gl.SCISSOR_TEST (Source: http://qaru.site/questions/17163582/two-equal-object-on-same-canvas-split-mode-webgl). **Lines 249 – 253** + **line 274** are creating a part of a canvas. And then I put between these lines everything what I want to paint.

Lines 255 – 268 are made using the example (https://www.cs.unm.edu/~angel/BOOK/INTERACTIVE_COMPUTER_GRAPHICS/SEVENTH_EDITION/CODE/07/shadedSphere2.js) , but I made it a bit simpler and avoided initialization of location of every variable in the connected *.html file also for the ModelView and Projection matrices.

Lines 270 – 272. Made using the example: https://www.cs.unm.edu/~angel/BOOK/INTERACTIVE_COMPUTER_GRAPHICS/SEVENTH_EDITION/CODE/07/textureCubev2.js

Lines 279 – 312. I initialize all needed variables as it is shown in examples above. **Line 292** is a part of my experiments with stable position of the eye point. All numbers in variables are changed just to make more or less pretty picture. In the **line 293** *thetha* and *phi* are multiplied to *Math.PI/360* to provide smoother rotation when regulating sliders.

Also important note: in the program I added 2 different variables: thetha – for the ModeView matrix and theta – for initializing of the texture. They are written in different way.

Lines 313 – 314. Check which kind of light model is activated w.r.t. data from the shading button.

Blocks "Draw left" (lines 316 – 324) and "Draw right: (**lines 326 – 338**) are made using the technology from http://qaru.site/questions/17163582/two-equal-object-on-same-canvas-split-mode-webgl.

P.S.: Dear professor, I made this work by myself using several available sources, links to them are presented in this paper. This is my big mistake that I haven't changed a lot of variables' names and have got such big amount of plagiarism. But this plagiarism, I guess, is made because of using public sources and common solutions.

Next homework I will make more carefully and will try to create something more individual and artistic.

Best regards,
Egor Orel
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