1st Graphics Project: Transformations

WebGL

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1 Task

The task is to create a simple robot that walks and moves its arms and legs, using WebGL (http://www.khronos.org/webgl/) and **JavaScript** only. The task is intended to demonstrate simple and fast cross-platform interactive application development using state-of-the-art technologies.

SPECIFICALLY:

- The robot needs to be able to move **left** and **right** using the left and right arrow keys respectively. The robot needs to be **rotated** accordingly so it always faces the walking direction. The rotation could be instant or gradual (frame per frame) - it is up to you. Both are accepted as correct.
- **While walking**, the robot's arms and legs should rotate around a stable axis, simulating the movement of their real counterparts. For example, while the left arm goes down, the right should go up and vice versa. When the left leg goes forward, the right goes backwards and so on...
- When no keys are pressed, the robot stops moving and arms/legs stop rotating.
- Submit your work in a compressed (for example .zip) file, which should contain your .htm file and the 'sandbox_files' folder. The name of the file should contain you FULL NAME and your Registration Number(A.M.). (For example: 123456789_panagiotis_drakopoulos.zip)
- Report is NOT required, but make sure you include some **comments to explain what you are doing and why. Not doing so will result in your answers being considered as wrong.**

TIPS:

- Remember, we want something very simple. Do what is asked above, but you can improvise or add functionality if you wish.
- To create the robot, use the provided cube. For example, use a small cube for the head, a bigger one for the body, and longer ones for the legs. Apply the appropriate global and local transformations to achieve the desired results.
- It is recommended you use **NotePad++** (`https://notepad-plus-plus.org/` to edit the code in the htm file. It is a simple text editor with syntax highlighting - useful for programming.

2 Recources

You are given an .htm webpage file, which contains the html canvas used to render the 3D scene, and javascript code that performs basic functions, such as:

- initializing webGL.
- initialization of a scene with a simple shader and a cube.
- simple transformations, such as cube translation and rotation.
- keyboard input handing

Firstly, read and understand the fundamentals of the given code example. In order to proceed, you need to be able to understand how a simple scene and a 3D object is rendered, how **tick()** works, how to apply local and global transformations and why/when we use **mvPushMatrix() / mvPopMatrix()** , as explained in class.

USEFUL LINKS:

- Learning WebGL Tutorial set: `http://learningwebgl.com/blog/?page_id=1217`
- Javascript tutorial: `http://www.tizag.com/javascriptT/index.php`

Good Luck!