

## Soapbox car

- **Name:** Dylan Van Assche
- **Date:** 24 May 2018
- **Repo:** <https://www.github.com/DylanVanAssche/opengl-car>

A futuristic soapbox car in OpenGL for the course Computergraphics by Herman Crauwels (Campus De Nayer, KU Leuven). This application provides a demo for several OpenGL functions and is written in ANSI C.

## Features

- [x] Basic car
- [x] Basic finish
- [x] Multiple 3D transformations (orthogonal, symmetric, ...)
- [x] Multiple cars on the screen
- [x] Show axes, light sources, ... controlled with a keyboard key
- [x] Improved finish
- [x] 4 different light sources
- [x] Switch between several shade models
- [x] Menu to configure the materials used to create the car
- [x] Keyboard shortcuts
- [x] Animates the wheels of the car
- [x] Texture support of the finish and the car
- [x] Toggle the alpha value of the car
- [x] Fog support

## Shortcuts

### Mouse

- Right click to show the menu where you can select several materials for each component of the car.
- You can also quit the application from the menu if you like.

### Keyboard

Key	Description
x/X	Move camera (X axis +/-)
y/Y	Move camera (Y axis +/-)
z/Z	Move camera (Z axis +/-)
i	Move camera to it's initial position

Key	Description
1	Toggle ambient light ( <code>GL_LIGHT0</code> )
2	Toggle diffuse light ( <code>GL_LIGHT1</code> )
3	Toggle specular light ( <code>GL_LIGHT2</code> )
4	Toggle spot light ( <code>GL_LIGHT3</code> )
s	Switch to shading mode <i>SMOOTH</i>
S	Switch to shading mode <i>FLAT</i>
l	Turn wireframe mode <i>ON</i>
L	Turn wireframe mode <i>OFF</i>
j	Turn axes <i>ON</i>
J	Turn axes <i>OFF</i>
p	Turn light positions <i>ON</i>
P	Turn light positions <i>OFF</i>
k	Turn checkpoints <i>ON</i>
K	Turn checkpoints <i>OFF</i>
g	Toggle wheel animation
G	Toggle car animation
t	Toggle textures
m	Toggle fog
M	Toggle fog mode ( <i>LINEAR</i> / <i>EXP</i> )
n	Toggle competition mode
f	Toggles coachwork transparency
h/H	Moves the spot height (+/-)
v/V	Manipulates the spot angle (+/-)
w/W	Manipulates the spot exponent (+/-)
b	Toggles light locking
e/E	Manipulates the material shininess (+/-)
q/Q	Quits the application

## How to build

1. Clone this repo: `git clone https://github.com/DylanVanAssche/opengl-car.git`
2. Enter the directory: `cd opengl-car`
3. Install all OpenGL libraries via your package manager, you can find the dependencies in the `MakeFile`.
4. Run `make` in the project directory.
5. Run `./car` to start the soapbox car.

## License

- Everything (except for the images, `initJPG.c` and `initJPG.h`) in this repository is available under the GPLv3 license.

- The images are available under separate licenses, see the folder **images** for more information.
- For `initJPG.c` and `initJPG.h` files, please check the comments in the files for more information.