***ZOMBIE SURVIVAL***

***Interactive Graphics Project***

***A circuit board

Description automatically generated***

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**1. Introduction**

The aim of the project was to create a 3D game through a library named ‘*three.js’*, one of the most popular JavaScript framework for displaying 3D content on the web.

We developed a first person shooter game whose rules are simple: the player is surrounded by a fixed number of zombies and, in order to save its own life and win the game, he must kill them all. If the player is touched by a zombie at least one time then the game is ended, otherwise the player can freely run within the map bounds aiming to shoot the zombies.

We have arranged four levels of difficulty (easy, medium, hard and madness), each in a separate JavaScript file, to let the player have a wider game experience and a brief tutorial that shows how to play the game.

**2. Three.js**

Three.js is a JavaScript library and an API (Application Programming Interface) that is used to create and display animated 3D computer graphics in a web browser without relying on proprietary browser plugin: this is possible due to the advent of *WebGL.*

Some of the main features are:

* Scenes: add and remove objects at run-time;
* Cameras: perspective, orthographic, cube, array and stereo;
* Geometry: planes, cubes, spheres, torus;
* Objects: meshes, particles and more;
* Materials: basic, Lambert, Phong, smooth shading, texture and more;
* Lights: ambient, directional, point, spot and shadows;
* Data loaders: binary, image, JSON and scene.

**3. Scene, environment and camera**

Through the method *‘Scene()’* it is possible create the scene. Scenes allows to set up what and where is to be rendered: objects, lights and cameras.

The environment is composed of buildings, sidewalks, lamps and the ground where the player can move. Each of them has been first imported from (repo name?) and then some of them have been modified by us as follows:

* Sidewalks: re-scaled (and changed the color (?), if we want) and added for each a bounding box to improve the collision management;
* Lamps: re-scaled

We added also a red fog in order to recreate the post-apocalyptic atmosphere.

Camera: it always looks ahead in front of the player; we chose the ‘*PerspectiveCamera’* since it mimics the way the human eye sees and hence matches perfectly the first person shooter games.

**4. Lights**