



Space Odyssey



Introduction to Computer Graphics – 2022/2023 – Project 1

Luis Carlos Afonso, 104171

The concept

- Simple FPS Game
- Space themed



<https://luiscarlos-104171.github.io/ICG>



Models and Scene Graph

- Custom made models
- Composed Scene Graph
 - Use of groups for complex models
 - Direct insertions onto the scene for simple models



Animations

- Asteroid destruction animation
- Frame rate independent
 - Based on a formula that will be discussed further on



Illumination

- Spot lights
 - On the ship itself
- Ambient light
 - On the world
- Material emissivity of the bullets



User Interaction

- Mouse to look around
- Keyboard to apply forces and interact with the simulation



Development

- Organized in several folders
- Using the latest EcmaScript Norm
- Use of OOP

```
const newPosition = lastPosition + speed * delta;
```

Function to calculate a movement given a speed in units per second independent from framerate

```
const acc = totalSystemForce / mass;  
const vel = oldVel + acc * delta;  
const pos = oldPos + vel * delta;
```

Euler's integration method



Problems

- Difficulties
 - Modeling the custom artwork
 - Lack of time to implement some features