

TunnelGL

OpenGL Game project

Plan

Demo

Realisation

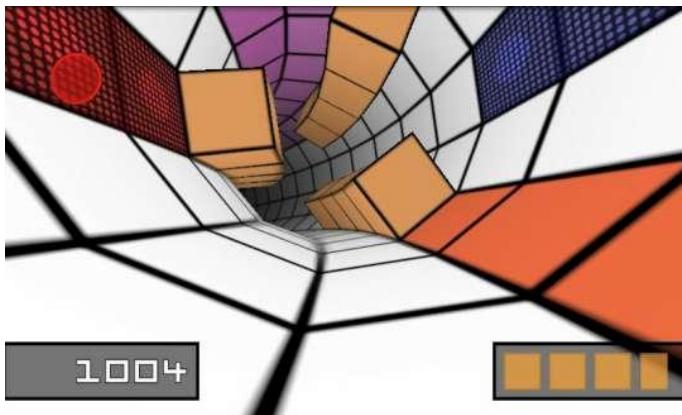
Debriefing

Reminder of the game proposition

But

Go the farthest as possible in the
Tunnel without any collision

Mock-up



Controls

| Key | Effect |
|-------------------|---------------|
| Directionnal Keys | Turn |
| Spacebar | Boost |
| Esc | Exit the game |

Fonctionnalities

- Infinite tunnel
- Score based
- Increasing difficulty

Demo

Realisation

Tunnel

Tunnel

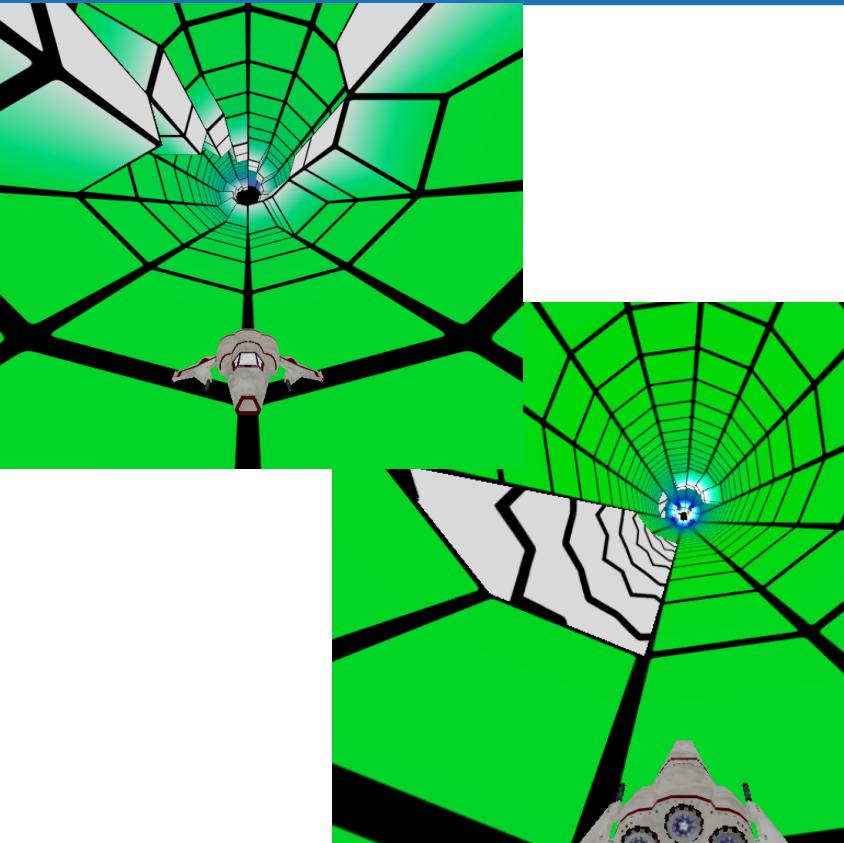
- Split in sections.
- 4 are always loaded at every moment.
- At the end of a section, another one is generated.
- The color is changing over the z axis.

Section

- Cylinder with holes and obstacles.
- Generated by loading a matrix.



Tunnel : Obstacles et trous



Obstacle

- Generated at the same time as the section's mesh.
- Generated by adding four points to the mesh in the cylinder axis direction.

Hole

- Generated by not adding two triangles to the section's mesh.

Loading a Section

```
1  
1  
2  
0 0 0 0 0 0 0 0 0 0 0 0  
0 0 0 0 0 0 0 0 0 0 0 0  
0 0 0 0 0 0 0 0 0 0 0 0  
0 0 0 0 0 0 0 0 0 0 0 0  
0 0 0 2 0 0 0 0 0 2 0 0  
0 0 0 2 0 0 0 0 0 2 0 0  
0 0 0 0 2 0 0 0 0 0 2 0  
0 0 0 0 2 0 0 0 0 0 2 0  
0 0 0 0 0 2 0 0 0 0 0 2  
0 0 0 0 0 2 0 0 0 0 0 2  
0 0 0 0 0 2 0 0 0 0 0 2  
0 0 0 0 0 2 0 0 0 0 0 2  
2 0 0 0 0 0 2 0 0 0 0 0  
2 0 0 0 0 0 2 0 0 0 0 0  
0 2 0 0 0 0 0 2 0 0 0 0  
0 2 0 0 0 0 0 2 0 0 0 0  
0 0 2 0 0 0 0 0 2 0 0 0  
0 0 2 0 0 0 0 0 2 0 0 0  
0 0 2 0 0 0 0 0 2 0 0 0  
0 0 2 0 0 0 0 0 2 0 0 0  
0 0 0 2 0 0 0 0 0 2 0 0  
0 0 0 2 0 0 0 0 0 2 0 0  
0 0 0 0 2 0 0 0 0 0 0 2  
0 0 0 0 2 0 0 0 0 0 0 2  
0 0 0 0 2 0 0 0 0 0 0 2  
0 0 0 0 2 0 0 0 0 0 0 2  
2 0 0 0 0 0 2 0 0 0 0 0  
2 0 0 0 0 0 2 0 0 0 0 0
```

Text file containing all the sections

A section's description contains :

- 1st line : id of the section
- 2nd line : difficulty (> 0)
- 3rd line : next section id
 - ◆ -1 if no section has to come after this one
- 24 by 12 matrix, for each section's square :
 - ◆ 0 : safe
 - ◆ 1 : hole
 - ◆ 2 : obstacle

Movements

Z movement :

- ❑ Initial speed of 70km/h
- ❑ Speed increases while time goes by.
- ❑ Boost : Speed increases 4 times faster. <SpaceBar>

Lateral movement :

- ❑ Angular speed limited by a friction factor of 0.95.
- ❑ Angular speed depends on the Z speed to make every section doable at every Z speed.
- ❑ Left and Right movements are made using <A-Q>/<D> or <Left>/<Right>.

Score and difficulty

Score :

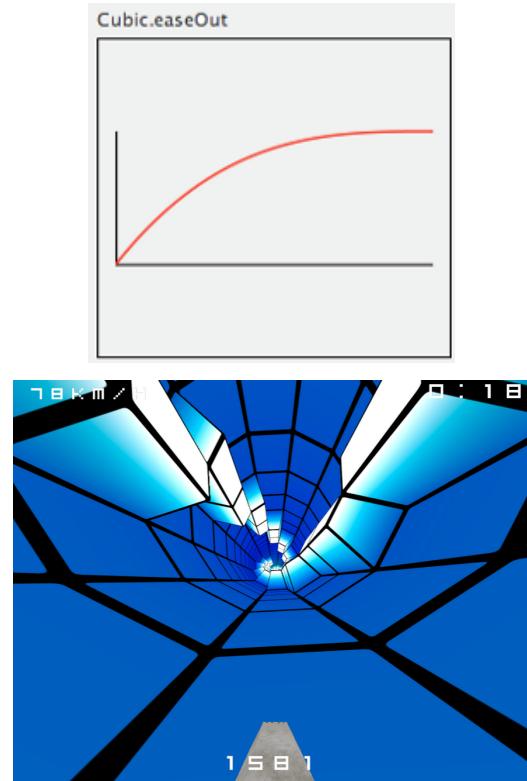
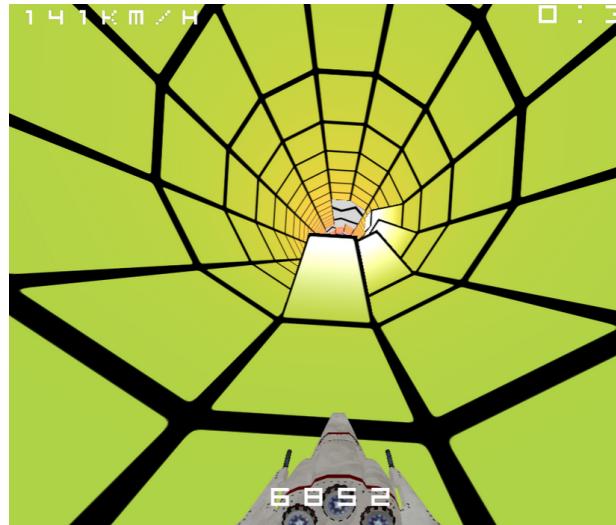
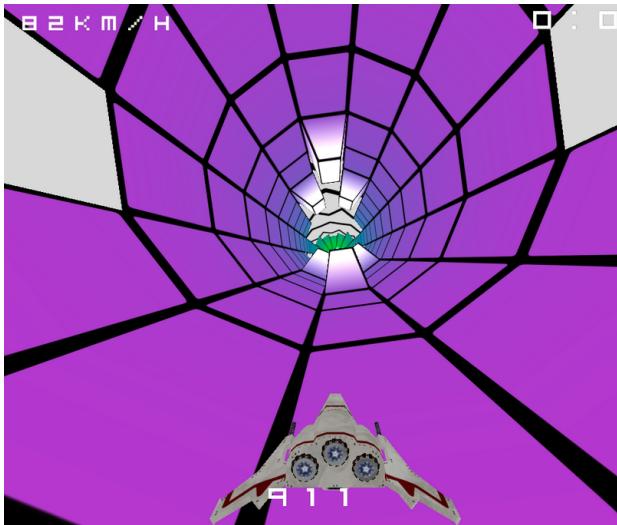
- Score increases with time and speed.
- Using the boost doubles the score.

Increasing difficulty :

- Z speed increases while time goes by.
- Every 10 successful sections, difficulty level goes up by one.
- Loaded sections are selected if their difficulty level is \leq to the current one.

Camera

- ❑ Behind the ship.
- ❑ Goes to the cockpit while boosting (Tweening).
- ❑ Vibration during a boost.
- ❑ Get closer to the ship while speed increases.



Screens

Engine :

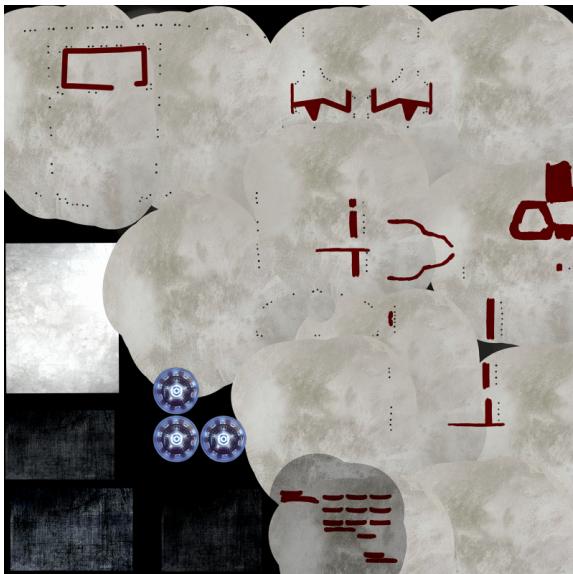
- ❑ Manages the screens (Initialization, parameter, load the next screen)

Screens :

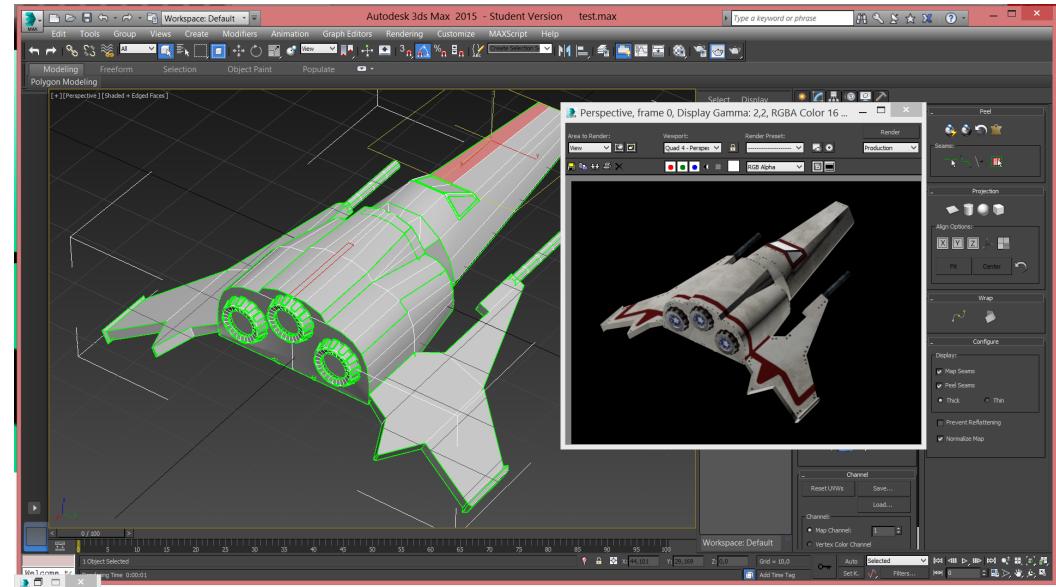
- ❑ Methods: init, update, draw et onEnd.
- ❑ MenuScreen: screen at the beginning of the game.
- ❑ GameScreen : display the game itself.
- ❑ EndScreen : displays last game's results, lets the player begin another one.

3D Model

Ship : 3D Model and Texture (done with 3ds Max)

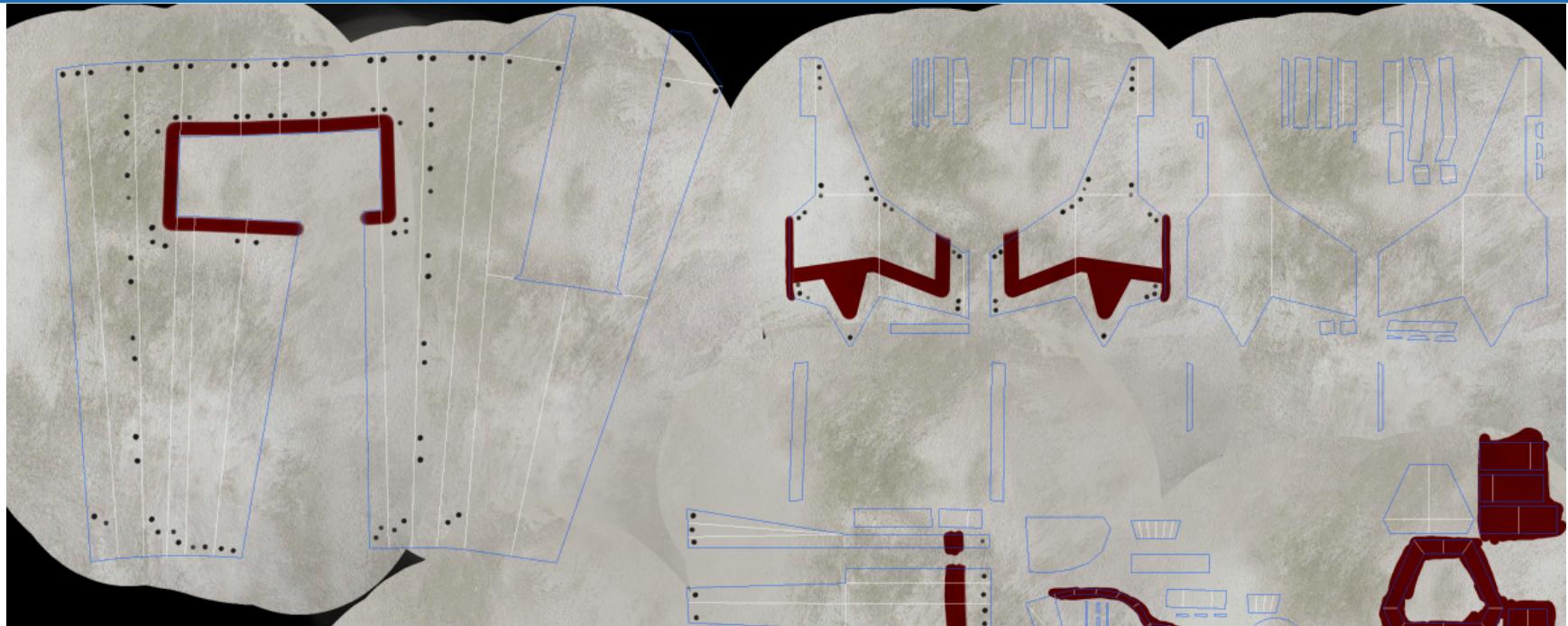


Texture file



Final result

3D Model

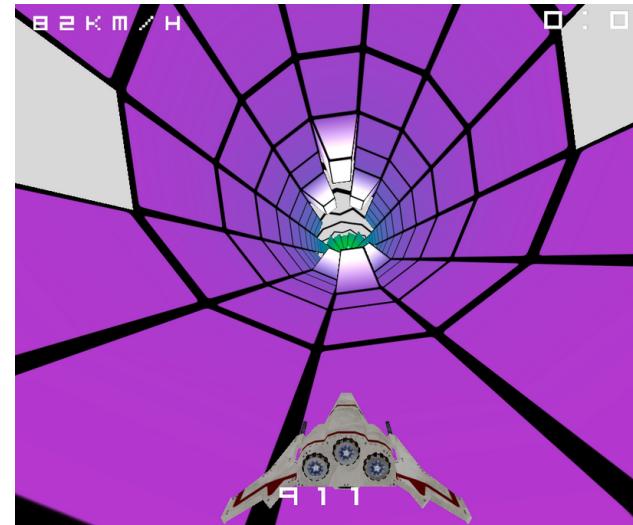


- + Automatically generated uv coordinates (and more easily)
- Long to do

Text

In game text :

- ❑ A DDS texture of a font we chose (Visitor.ttf) is loaded.
- ❑ For each letter, uv coordinates are mapped..
- ❑ Transparency around the letters.
- ❑ Every frame: score, time and speed display (HUD).



P R E S S E N T E R T O S T A R T !

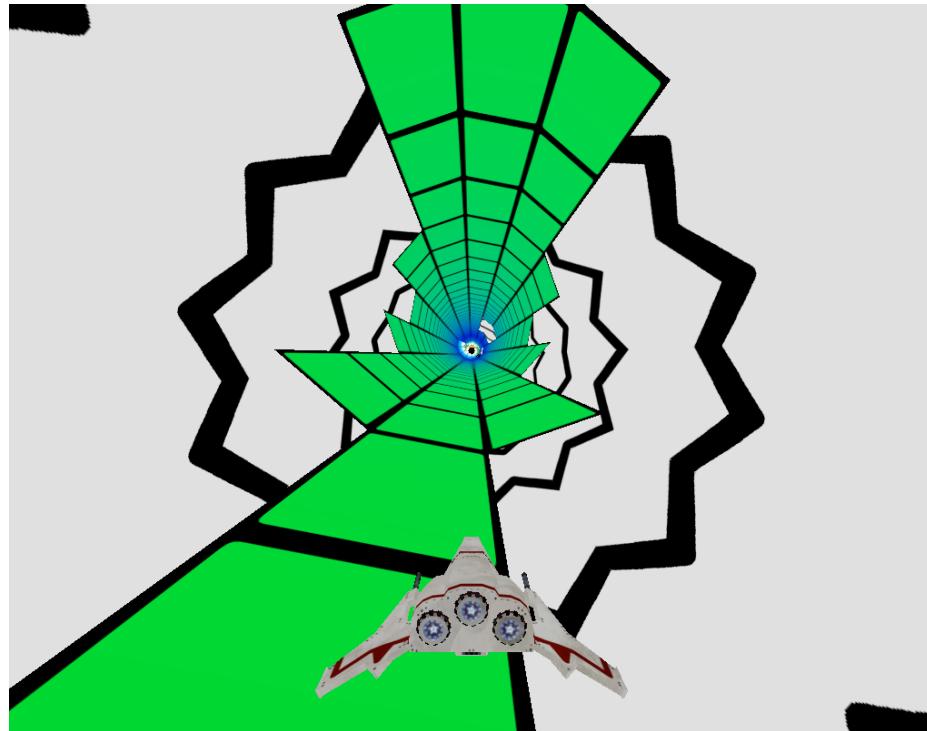
Sound

Basical sound systme with irrKlang

- ❑ In game music (SuperHexagon's music)
- ❑ Sound during event (Generated with sfxr)
 - Crashing into an obstacle
 - Falling into a hole
 - Boost

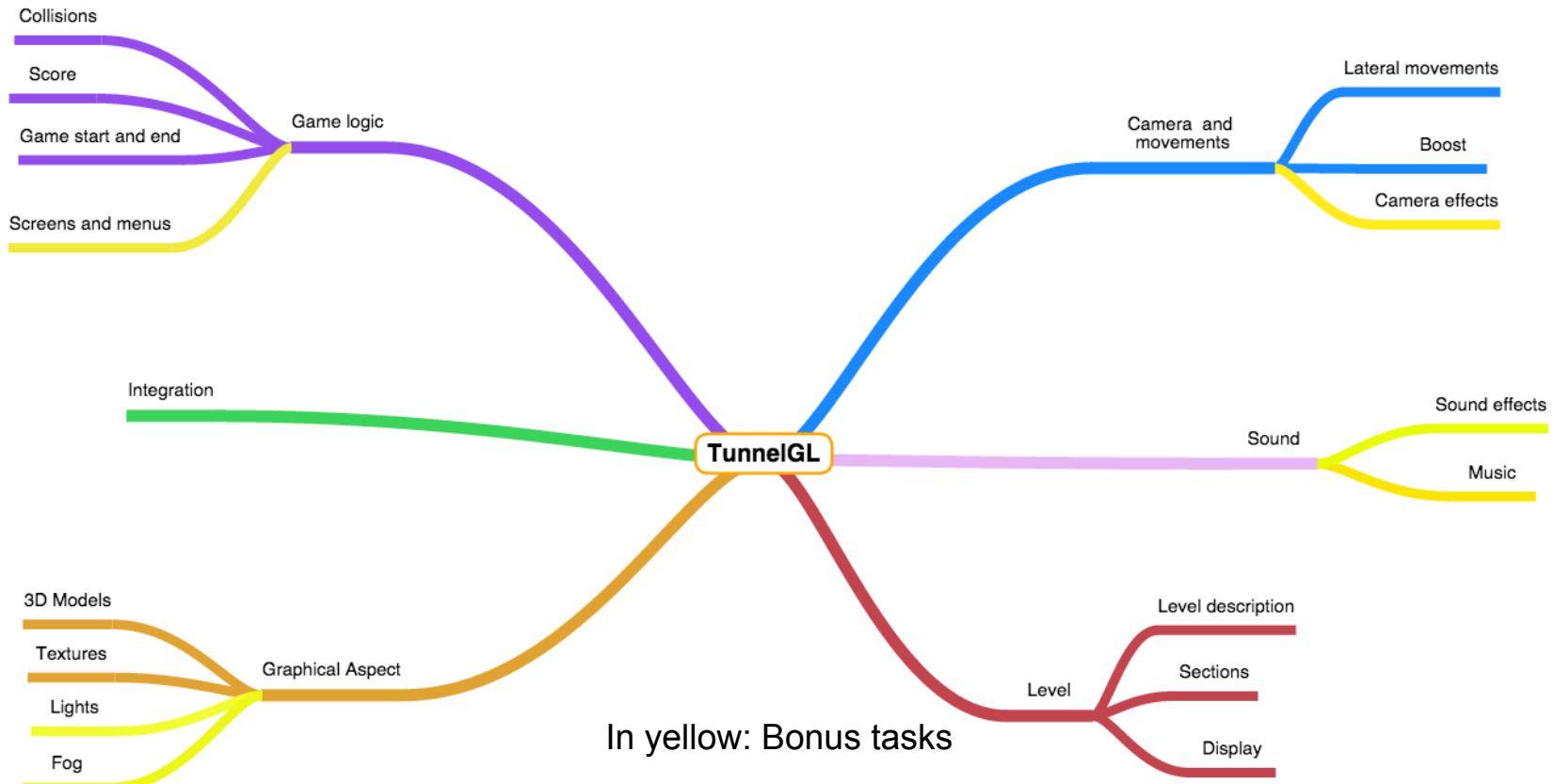
SkyTube

- SkyBox concept but with a tube
- Visible thanks to the holes
- Following the Z displacement of the player
- No rotation
- Better hole visibility



Debriefing

MindMap before the project start



What went right

- Interesting and functional game at the end of the week.
- Improving a prototype made the development easier.
- Most of the bonus tasks were implemented.
- Not planning too much things and classifying the tasks by their importance was good.

What went wrong

- Some people weren't familiar with git.
- The UV mapping of the ship had to be redone several times.
- The beginning of the project was slow (self-made API tooking a long time to be developed).
- The self-made OpenGL API is pretty bad.

It's too bad that only two TP session one week apart from each other were allocated to this project.

The project was held during exams preparation.

What could have been better

- Adding thrusters to the ship (visual effects, sound, ...)
- Adding more sections to the game
- Having an “infinite” mode and a “level” mode
- Section’s editor
- Bump mapping of the Tunnel

Thank you for your attention !

Annexe : Class diagram of the project

