



# Orxonox

# Introduction to level design

P&S Orxonox FS17

Maxim Aebischer





# Orxonox

**Level design = adding objects to a 3D scene**

- **Visible objects**
  - Models (Spaceships, Astroids, Spacestations,...)
  - Particle effects
  - Light
  - Sound
- **Invisible objects**
  - Quests/Missions
  - Waypoints for AI spaceships
  - Triggers & Events



# Orxonox

## .owx orxonox level file structure

```
1 <LevelInfo
2   name = "Empty level"
3   description = "A level with absolutely nothing in it"
4   tags = "test"
5   screenshot = "emptylevel.png"
6 />
7
8 <?lua
9   include("stats.oxo")
10  include("HUDTemplates3.oxo")
11  include("templates/lodInformation.oxt")
12 ?>
13
14 <?lua
15   include("templates/spaceshipEscort.oxt")
16 ?>
17
18 <Level>
19   <templates>
20     <Template link=lodtemplate_default />
21   </templates>
22   <?lua include("includes/notifications.oxi") ?>
23
24   <Scene
25     ambientlight = "0.8, 0.8, 0.8"
26     skybox       = "Orxonox/Starbox"
27   >
28
29
30   <Light type=directional position="0,0,0" direction="0.253, 0.593, -0.765" diffuse="1.0, 0.
31   <SpawnPoint team=0 position="-200,0,0" lookat="0,0,0" spawnclass=SpaceShip pawnDesign=spaceShip .0" />
32
33
34
35
36
37 </Scene>
38 </Level>
39
40
```

Add level description here

Includes (e.g. space ship templates, HUDs, )

Spaceships, Portals, Light, Sound, Quests, AI controllers, ...



# Orxonox

## Adding a model to the scene

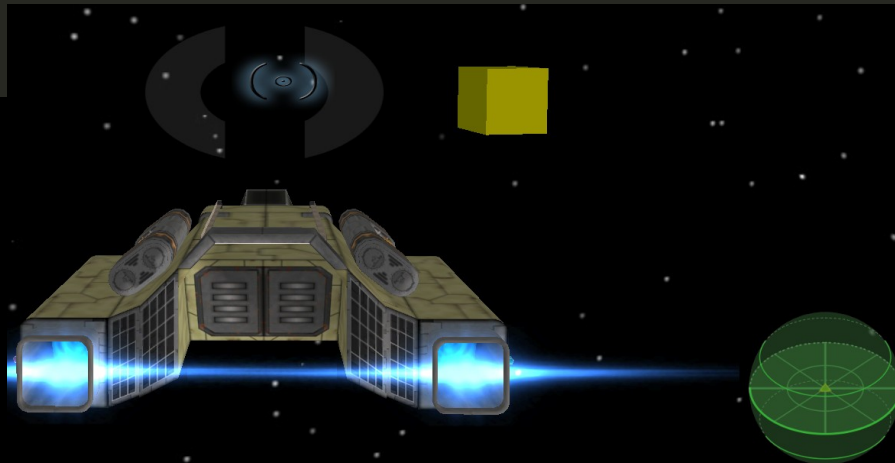
```
<Level>
<templates>
  <Template link=lodtemplate_default />
</templates>
<?lua include("includes/notifications.oxi") ?>

<Scene
  ambientlight = "0.8, 0.8, 0.8"
  skybox       = "Orxonox/Starbox"
>

<Light type=directional position="0,0,0" direction="0.253, 0.593, -0.765" diffuse="1.0, 0.9, 0.9, 1.0" specular="1.0, 0.9, 0.9, 1.0"/>
<SpawnPoint team=0 position="-200,0,0" lookat="0,0,0" spawnclass=SpaceShip pawndesign=spaceshipescort />

<Model mesh="cube.mesh" position="0,0,0" scale=10 />

</Scene>
</Level>
```





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## Collisionshapes

```
<Light type=directional position="0,0,0" direction="0.253, 0.593, -0.765" diffuse="1.0, 0.9, 0.9, 1.0" specular="1.0, 0.9, 0.9, 1.0"/>
<SpawnPoint team=0 position="-200,0,0" lookat="0,0,0" spawnclass=SpaceShip pawnDesign=spaceshipescort />

<StaticEntity position="0,-10000,0" direction="0,-1,0" collisionType=static mass=100000 friction=0.01 >
  <attached>
    <Model position="0,0,0" mesh="cube.mesh" scale3D="10000,10000,1000" />
  </attached>
  <collisionShapes>
    <BoxCollisionShape position="0,0,0" halfExtents="10000,10000,1000" />
  </collisionShapes>
</StaticEntity>
```

- A model is only visible. Nothing else!
- To get a solid object, you need to add a collision shape.
- Attach Model to StaticEntity
- Specify physics (mass, friction, ...) of StaticEntity





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## Other types of objects for level design

- Portals
- SpaceBoundaries
- Pickups
- Planets

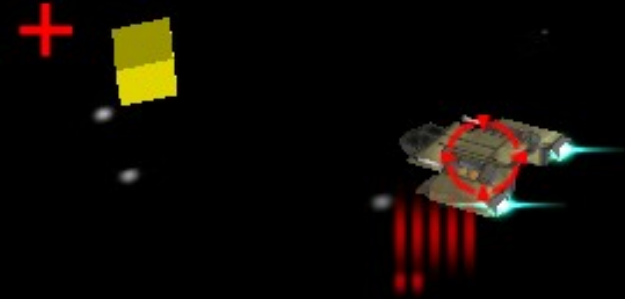




# Orxonox

## AI Spaceship with WaypointPatrolController

```
<SpaceShip position="300,0,0" lookat="0,0,0" team=3>
  <templates>
    <Template link=spaceshipscort />
  </templates>
  <controller>
    <WaypointPatrolController accuracy=10 team=3>
      <waypoints>
        <Model mesh="cube.mesh" scale=8 position="300,0,0" />
        <Model mesh="cube.mesh" scale=8 position="300,500,0" />
        <Model mesh="cube.mesh" scale=8 position="0,500,0" />
        <StaticEntity position="0,0,0" />
      </waypoints>
    </WaypointPatrolController>
  </controller>
</SpaceShip>
```



- Controllers control (move, fire, boost, ...) ControllableEntities (e.g. SpaceShips)
- Specify waypoints for WaypointPatrolController
- More intelligent controllers for AI enemies available



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## Triggers & Events

```
<ParticleSystem position="0,0,0" source="Orxonox/bigexplosion" lifetime=3.5 loop=0 autostart=0>
  <events>
    <spawn>
      <EventListener event="spawnparticle" />
    </spawn>
  </events>
</ParticleSystem>
<DistanceTrigger name="spawnparticle" position="0,0,0" target="SpaceShip" distance=50 stayActive="true" />
```

- Dynamic levels. Level changes depending on player behaviour, time, ...
- Example: Particle effects runs if a SpaceShip triggers the DistanceTrigger
- Complicated combinations of triggers possible (e.g. run the particle effect only if trigger A was triggered first and the trigger B was triggered)





# Orxonox

[http://www.orxonox.net/wiki/PPS\\_main](http://www.orxonox.net/wiki/PPS_main)

## 3rd to 6th Semester

Facts about our PPS for the 3rd to 6th semester:

- You get **3KP**
- The PPS takes place on **Thursday, 13:15 until 16:00**
- The PPS starts on 2 March 2017
- Room: ETZ D96

For more information feel free to contact the PPS leaders:

- Maxim Aebischer (maxima@...)
- Florian Zinggeler (zifloria@...)
- Patrick Wintermeyer (patricwi@...)
- Cyrill Burgener (bucyril@...)

## Timetable

Date	Room	Topic	Slides
2 mar	ETZ D96	Introduction and Tools (wiki, forum, svn and blender), <a href="#">Download the game</a> , <a href="#">Blender Tutorial</a> , <a href="#">Blender to Orxonox</a>	
9 mar	ETZ D96	Framework and coding to level design <a href="#">tutorial</a>	
16 mar	ETZ D96	Choose the projects, start	
23 mar	ETZ D96	Project Work	
30 mar	ETZ D96	1st Review / Project Work	
6 apr	ETZ D96	Project Work	
13 apr	ETZ D96	Project Work	
20 apr		Easter Break	
27 apr	ETZ D96	2nd Review / Project Work	
4 may	ETZ D96	Project Work	
11 may	ETZ D96	3rd Review / Project Work	
18 may	ETZ D96	Presentation Preparation / Polish Up	
25 may		Ascension Day (Auffahrt)	
1 jun	TBD	Presentation	

