Orxonox

Introduction to level design

P&S Orxonox HS17

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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

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.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
31    <Light type=directional position="0,0,0" direction= 0.253, 0.593, -0.765" diffuse="1.0, 0.          .0"/>
32    <SpawnPoint team=0 position="-200,0,0" lookat="0,0,0" spawnclass=SpaceShip pawndesign=spac
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, ...

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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>
```
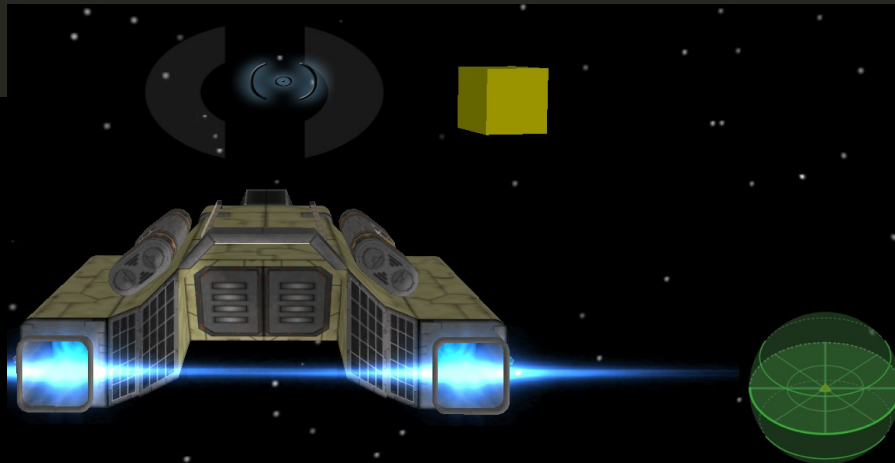
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Collisionshapes

```
<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 collishion 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

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AI Spaceship with WaypointPatrolController

```
<SpaceShip position="300,0,0" lookat="0,0,0" team=3>
  <templates>
    <Template link=spaceshipescort />
  </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

```
<ParticleSpawner position="0,0,0" source="Orxonox/bigexplosion" lifetime=3.5 loop=0 autostart=0>
  <events>
    <spawn>
      <EventListener event="spawnparticle" />
    </spawn>
  </events>
</ParticleSpawner>
<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)

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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), Download the game, ⇨Blender Tutorial, Blender to Orxonox	
9 mar	ETZ D96	Framework and coding t... level design tutorial	
16 mar	ETZ D96	Choose the projects, sta...	
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	