UNIVERSITAT POLITÈCNICA DE VALÈNCIA
CAMPUS D'ALCOI

Physics Unity

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unity

Physics in Unity

- **Unity** has a very powerful physics engine called **PhysX**
- If we want a specific GameObject to be under the control of the physics engine we have to add the component **Rigidbody**, so the object will be under the gravity force and other forces produced because collisions with other objects or forces we apply in our scripts. For collision detection we also need to add a **Collider.**
- We will be using rigidbodies for things the player can push or move by using forces
- When an object has the **Rigidbody** component (and it is non-kinematic), it won't be convenient to change its **Transform** component but to change its position and orientation by applying forces or torques
- It is also possible to add **joints** with other objects in order to create more complex behaviors
- **RigidBodies** clicked as kinematic (**isKinematic**) are not going to be under the control of the forces and they are used for special cases, when, for example, we want to detect collisions but without being under the control of the physics engine
- We can also add only the **Collider** component, without Rigidbody, when we are modeling static objects, such as walls etc.

2D Physics in Unity

- **Unity** has also a 2D physics engine: **Box2D**
- We will be using it when developing 2D games with 2D gameobjects
- When doing it all the elements we are going to see will have the ‘2d’ suffix, such as **Rigidbody2d**, **Collider2d**, **Collision2d**, **OnCollisionEnter2d** etc.
- These elements can also be found in the editor at **Component -> Physics 2D**

Physics in Unity

- We have many properties in a **Rigidbody**, being the most important:
    - **Mass**. The weight of the object in Kgr.
    - **Drag**. How much resistance from the air the object has when moving.
    - **Angular Drag**. How much resistance from the air the object has when rotating
    - **Use Gravity**. If we want the object to be or not under the gravity force.
    - **Is Kinematic**. If the Rigidbody is kinematic or not.

- Additionally, we can create physic materials (**Physic Material**) in order to better adjust the friction and bouncing factors of the objects (Assets->Create->Physics Material)

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