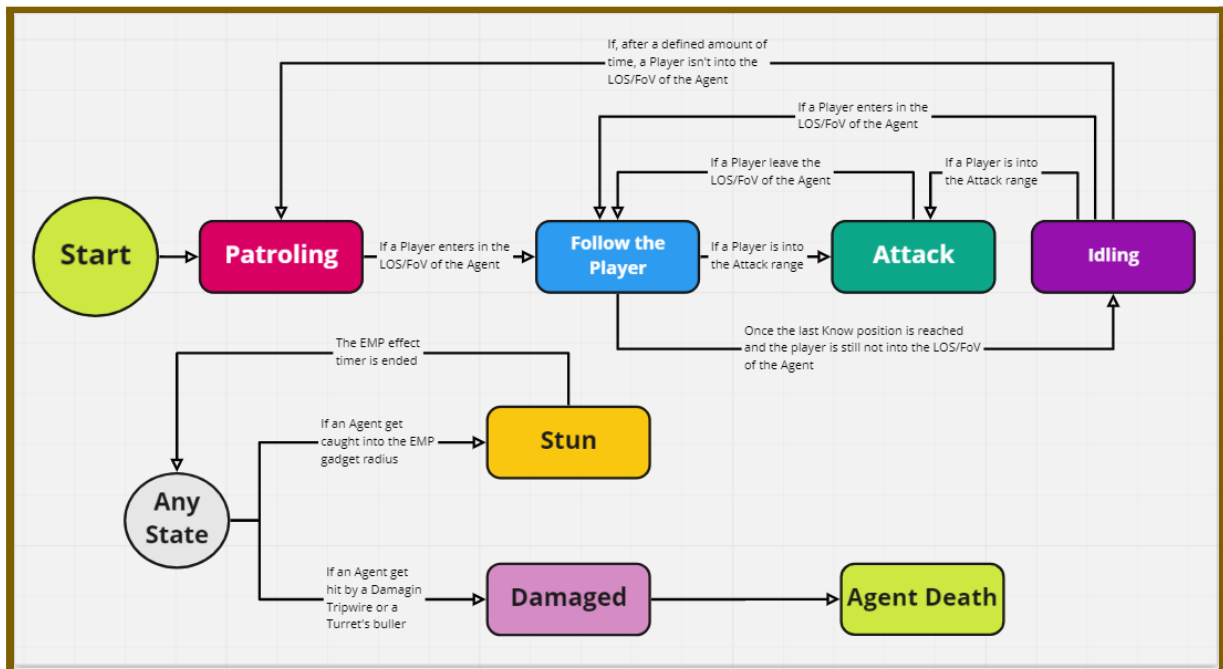# Dungeon Agents
28/05/2021

Agents are enemies that move in the dungeon, eventually **dealing** Damage to the player.

1 State Machine IA

[Miro Board Link](#)

1.1 States Description

- **Start:**
Agent's starting position on the map.

- **Patrolling:**
In this state agents follow a patrolling pattern on the map.
The patrolling course consists of an ordered list of **Waypoints** (transforms) that the agents have to run across.
Once an agent reaches the **last Waypoint**, automatically **restart** the patrolling pattern reaching the first Waypoint of the list.

- **Following:**
When a Player enters the agent Fov the agent starts to follow until it reaches its **Attacking Range**.
If two Players are inside the agent FoV the agent will target the closest.

- **Attacking:**
When a Player is within the agent **Attacking Range**, the agent starts to shoot until the target is out of range.
When the target leaves the Attacking Range, the agents have to move to the last known player position.

- **Idling:**
When a Player (or every Player if more than one is present) **leaves** the agent's Fov for whatever reason, the agents enter this state.
In this state the agent follows the Player at his last known position.
Reached the last known position without finding the Player the agent stop and maintains this position for an x time **(idlingTime)**
If **during (idlingTime)**a player **goes back** inside the agent radius, the agent will go back in the **Attacking / Following** state.
If **after (idlingTime)** a player **does not go back** inside agent radius, the agent returns back in the **Patrolling** state, reaching the last waypoint reached.

- **Stun:**
If an agent is caught in the **EMP** radius it becomes stunned, while stunned the agent stops attacking and maintains its position for the duration of the Emp effect.
When the EMP effect ends the agent goes in **Idling** if a player isn't in its Fov.
When the EMP effect ends the agent goes in **Attacking/Following** if a player is into its Fov.

- **Damage:**
This state is entered when an agent receives damage by being hit by **turret's** fire.
This state can be entered while the agents is in every other state; while in this state the agents will keep the behaviour of the previous state.
If the agent's hp pool reaches **0** the agent has to be destroyed with an explosion feedback effect.

2. Agent Types

2.1 Range Shooter Agent (RSA)

- Has a **capsule collider** of an **x height** and y **radius.**

- **Field of View**: Is the element that defines the presence or not of the players into the ASs range of view. FoV has to be implemented via a spherecast system, so it has to be regulated by the following values:
  (**asSphereDimension**): dimension of the sphere collider for the SCs (float variable).
  (**asAngleFoV**): angle of vision on the horizontal axis of the SCs, once the player enters the sphere trigger (float variable).

- If the **field of view** overlaps with the character (**detectability**), the **RSA** can spot the character, aim at his collider, shoot at him, and leave his pattern to follow the character.

- When the **RSA** follows the character he will keep himself at a certain minimum distance from the character (**asShootingRange**).

- Has a movement speed (**msSpeed**) and an **x speed** at which they can rotate to aim at the character (**msAimSpeed**).

- Shoot projectiles that deal an **x damage (asDamage)** to the character, move at an **x speed** (**asBulletSpeed**) and have an **x time** between shots (**asRatio**).

- Has a discrete HP pool, (**maxHealth**) that can be decreased if the agent collider is hit by projectiles.
  When **maxHealth** reaches 0 the agent is destroyed.

Note: the following paragraph is not implemented in the final version of the game.

2.2 Physical terrain Agent

Very similar to the mobile shooter but with different values and close ranged

- Has a **capsule collider** of an **x height** and y **radius.**

- **Field of View**: Is the element that defines the presence or not of the players into the PTs range of view. FoV has to be implemented via a spherecast system, so it has to be regulated by the following values:
  (**ptSphereDimension**): dimension of the sphere collider for the SCs (float variable).
  (**ptAngleFoV**): angle of vision on the horizontal axis of the SCs, once the player enters the sphere trigger (float variable).

- If the **field of view** overlaps with the character (**Character trigger radius)**, the **PA** can spot the character, aim at his collider and leave his pattern to follow the character.

- PT has an area of an x radius (**ptRange**) around his collider in which he can deal an x amount of damage (**ptDamage**) to character with a cooldown between damage tick (**ptRatio**).

- has a movement speed (**ptSpeed**) and an **x speed** at which they can rotate to aim at the character (**ptAimSpeed**).

- Has an x Lifetime, (**ptLifetime**) that can be decreased if the agent collider is hit by turret projectiles or damaging tripwires. When lifetime reaches 0 the agent is destroyed.