

# Task 14 – Spike: Agent Marksmanship

## Context:

The method of targeting an agent uses to attack a target with a range weapon should depend on weapon projectile characteristics. In particular speed (infinite or finite), accuracy and range are all worth considering as part of a targeting plan.

## Knowledge/Skill Gap:

Developer needs to be able to implement agent-targeting methods, including target prediction, so that the agent can successfully use different projectile weapons.

## Goals/Deliverables: [CODE] + [SPIKE REPORT]

Create an agent targeting simulation with:

- an attacking agent (can be stationary),
- a moving target agent (can simply move between two-way points), and
- a selection of weapons that can fire projectiles with different properties.

Be able to demonstrate that the attacking agent that can successfully target (hit) with different weapon properties:

- Fast moving accurate projectile. (Rifle)
- Slow moving accurate projectile. (Rocket)
- Fast moving low accuracy projectile (Hand Gun)
- Slow moving low accuracy projectile (Hand grenade)

**Start-End Period:** Week 8 – Week 9

## Planning Notes:

- The attacking agent can be static, and the target can be a simple.
- Create a simple weapon for the agent that can shoot projectiles of different types. The projectile (bullet) will need to be moved each update step and tested for collisions with a target.
- Start by shooting accurate projectiles at a fixed target. Change the state of the target so that a "hit" can be clearly seen.
- Create "inaccurate" projectiles that don't always go where they are aimed.
- Move the target. The shooting agent will need to use the targets position and velocity, together with the projectile speed, to work out an interception point to shoot at.

## Extensions:

- Include "rate of fire" and "effect range" in the decision process. Specifically, create a "shotgun" weapon which has a low rate of fire and a very short (but deadly) effective range. Move the attacking agent to close range before shooting.
- Splash damage. Create a projectile that hits the ground and explodes where aimed, and update the targeting agent to use this effectively.
- Tough target. Update the target so that it can avoid slow moving projectiles and/or take cover when attacked. (Create cover locations?!)