Concept: 'Ant Trail'

Team Members

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Targets

We want to create an ant trail application in unreal engine.
The goal is to have a colony of ants placed in the middle of a map. The ants do need to provide food for their colony. Therefore all ants will leave the colony looking for food in random directions. If they do not find food in a defined time they will return to the colony. Once an ant finds a food source they will pick up a part and carry the food back to the colony.
The ant will leave an information trail while returning to the colony, so other ants can follow that trail to find the food source.

Algorithms

The ants need to find a way in probably blocked terrain. So we will implement an wayfinding algortihms, like A*.
The ant agent will be probably controlled by a finite state machine see: Paper: Solving Five Instances of the Artificial Ant Problem with Ant Colony Optimization and Unreal Wiki on Finite State Machines

Timetable / Effort

Map Setup

First we want to create a static map that contains 2-3 food sources, blocking terrain and the colony. Later this might be generated in a random way. This will be mostly modeling without materials or animations.
Estimation: 20h

AI control

Second we want to implement the "AI", probably finite state machines controlling the ants.
Estimation: 30h

Materials:

We need materials for

- the ant
- grass
- blocking terrain like stones or trees or branches

- food on the ground, like apples or dead wasps This will be used to create blueprints that look good and will be reused.

Estimation: 20h

Lighting:

We want to have a real sun like lighting. So we want a static sun like lighting from a higher corner throwing shadows on the map. In a later stage we might use a daylight circle where we have day and night phases changing the light. This might also be user controlled in the UI.

Estimation: 10h

Particles:

We want to create the pheromone trail ants leave behind as particles to make them visible.

Estimation: 25h

Audio:

Some windy forrest sounds in the background. There will be sound effect when a ant finds a new food source or when a ant finds a pheromone trail of another ant.

Estimation: 20h

Animations

We will animate the movement of the ant agents. Also there should be a animation for an agent picks up food and the delivery back to the colony (which is different to the default walking animation)

Estimation: 40h

Player HUD + Menu

We do not want the player to have an active part in the simulation. Though the player should be able to move the camera through the map. Also the player should be able to start, stop and continue the simulation. Also will be a way to reset the simulation to start. (Probably when we can randomly create maps)

Estimation: 25h

Meetings & project setup

Github repo setup, meetings, overhead

Estimation: 20h

Milestones

Task	Done by	Effort
Map Setup	18.04.2022	20h
AI Control	02.05.2022	30h
Player HUD	02.05.2022	25h

Task	Done by	Effort
Materials	02.05.2022	20h
Lighting	15.05.2022	10h
Particles	27.05.2022	25h
Audio	27.05.2022	20h
Animations	27.05.2022	40h
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Implementation		190h
Meeting & project setup:		20h
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Overall:		210h