GAM457 DOCUMENTATION

INSTRUCTIONAL

PLAYER

Player movement: ASWD or Arrows keys

Player sneak: Hold left control while moving (sneak emits no sound)

Players can replenish health from the pink nodes when the light it on.

No health = Dead

ENEMY

Enemies will search for energy or go to a known location when low.

They can hear you when you are close unless you sneak

They will search hiding places if they think you are close

When alerted the enemy's vision system is better

When spotted, you will be shot from above.

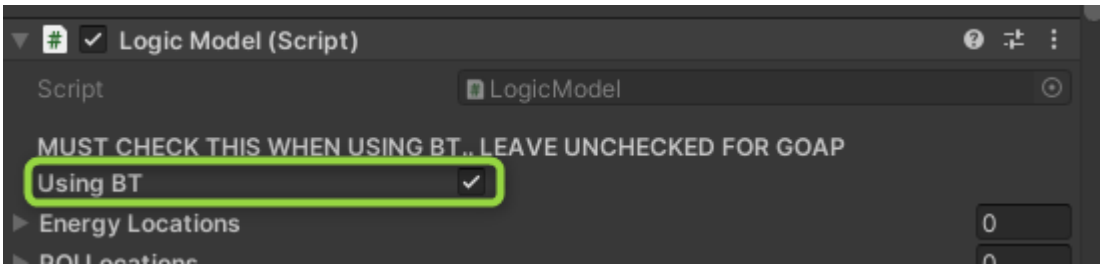
You can not hurt them

GAME PLAY

Stay alive by eating food and staying out of sight. Try getting seen or heard then hiding behind an obstacle. Sneak away if you can. The enemy GOAP states are shown in the debug panel.

IMPORTANT

You can play in the GOAP or BT scene. Please make sure you check Using BT in the inspector when in the BT scene



TECHNICAL

Enemy pathfinding: Unity3D NavMeshAgent

Enemy GOAP: AntAI

Vision System

Vision system works by getting all objects that are in a targetable mask layer and omits the ones that are not in the field of view. It then sends the list to the Logic Model for processing

Logic model will automatically list food and energy locations.

If a player is in that list it will store the player variables in a class. Variables: *playerGamobject, playerLastknownTransform (has memory loss cooldown), LastKnownVelocity, suspicionScore*

The variable *suspicionScore* is calculated once every AntAI update. Variables such as distance from eyesight, cooldown rate, and velocity can be used to calculate a float.

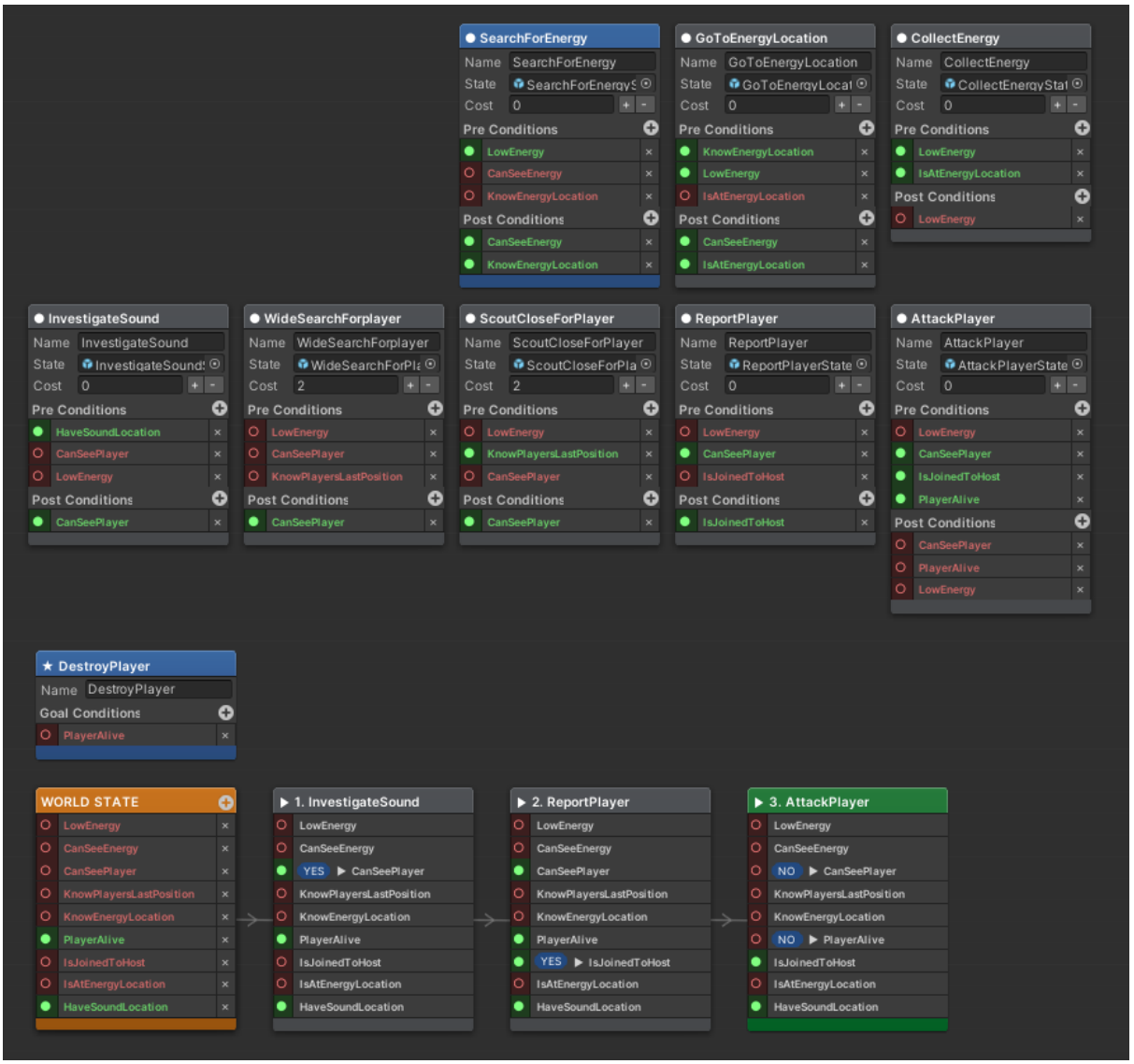
Once the suspicion score reaches 100% the player is seen. Lower suspicion scores means that the player is in eyesight but not yet recognised.

The variables *detectionStrength, viewMaxDistance, distanceSuspicionMultiplyer, sensitivityToMovemen*t all increase the suspicion score

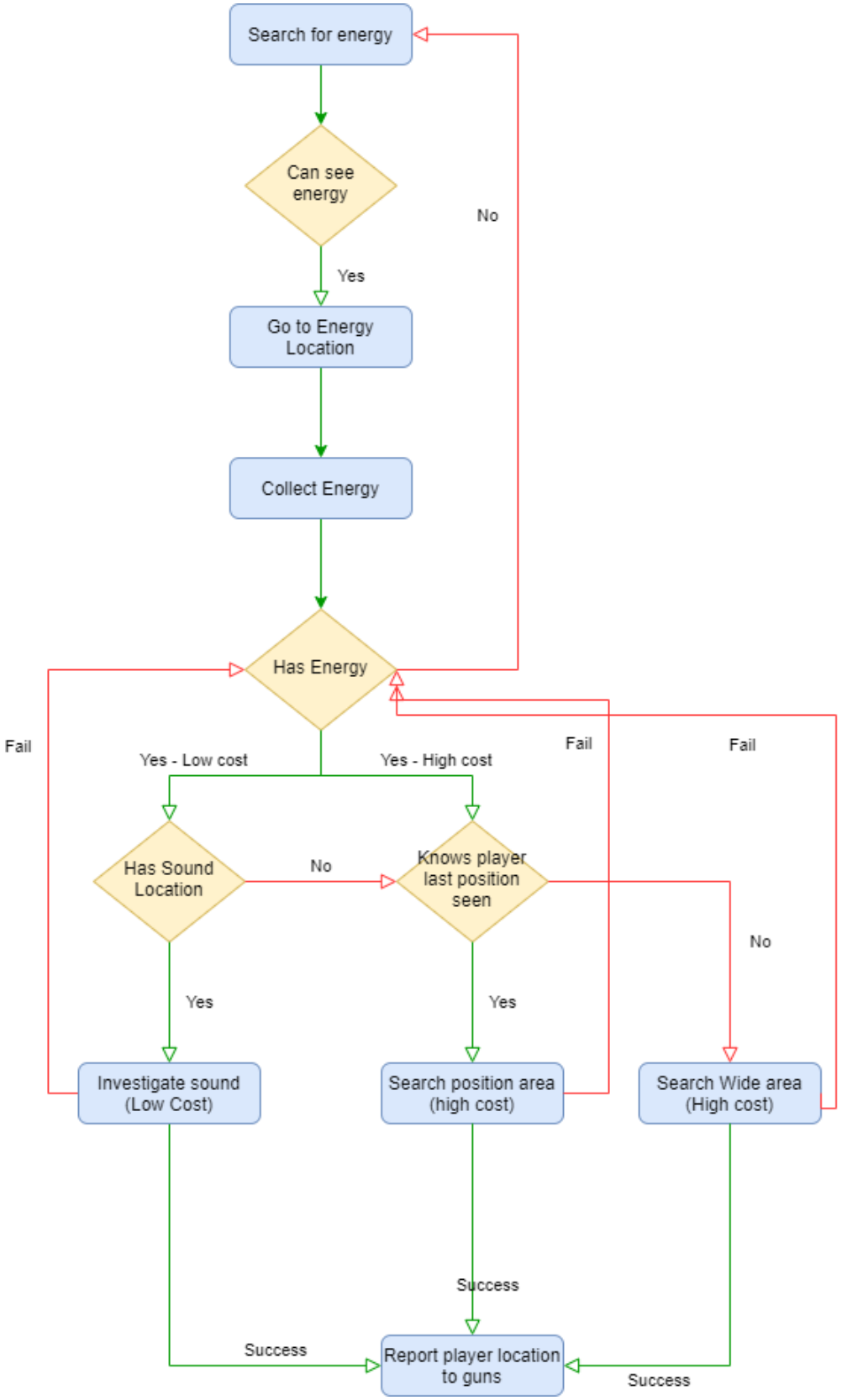
The variable *cooldownRate* lowers the suspicion score.

The logic system can deal with any number of players

GOAP


SearchForEnergy
Name SearchForEnergy
State SearchForEnergyS
Cost 0
Pre Conditions
LowEnergy
CanSeeEnergy
KnowEnergyLocation
Post Conditions
CanSeeEnergy
KnowEnergyLocation
GoToEnergyLocation
Name GoToEnergyLocation
State GoToEnergyLocat
Cost 0
Pre Conditions
KnowEnergyLocation
LowEnergy
IsAtEnergyLocation
Post Conditions
CanSeeEnergy
IsAtEnergyLocation
CollectEnergy
Name CollectEnergy
State CollectEnergySta
Cost 0
Pre Conditions
LowEnergy
IsAtEnergyLocation
Post Conditions
LowEnergy
InvestigateSound
Name InvestigateSound
State InvestigateSound
Cost 0
Pre Conditions
HaveSoundLocation
CanSeePlayer
LowEnergy
Post Conditions
CanSeePlayer
WideSearchForplayer
Name WideSearchForplayer
State WideSearchForPla
Cost 2
Pre Conditions
LowEnergy
CanSeePlayer
KnowPlayersLastPosition
Post Conditions
CanSeePlayer
ScoutCloseForPlayer
Name ScoutCloseForPlayer
State ScoutCloseForPla
Cost 2
Pre Conditions
LowEnergy
KnowPlayersLastPosition
CanSeePlayer
Post Conditions
CanSeePlayer
ReportPlayer
Name ReportPlayer
State ReportPlayerState
Cost 0
Pre Conditions
LowEnergy
CanSeePlayer
IsJoinedToHost
Post Conditions
IsJoinedToHost
AttackPlayer
Name AttackPlayer
State AttackPlayerState
Cost 0
Pre Conditions
LowEnergy
CanSeePlayer
IsJoinedToHost
PlayerAlive
Post Conditions
CanSeePlayer
PlayerAlive
LowEnergy
★ DestroyPlayer
Name DestroyPlayer
Goal Conditions
PlayerAlive
WORLD STATE
LowEnergy
CanSeeEnergy
CanSeePlayer
KnowPlayersLastPosition
KnowEnergyLocation
PlayerAlive
IsJoinedToHost
IsAtEnergyLocation
HaveSoundLocation
1. InvestigateSound
LowEnergy
CanSeeEnergy
YES CanSeePlayer
KnowPlayersLastPosition
KnowEnergyLocation
PlayerAlive
IsJoinedToHost
IsAtEnergyLocation
HaveSoundLocation
2. ReportPlayer
LowEnergy
CanSeeEnergy
CanSeePlayer
KnowPlayersLastPosition
KnowEnergyLocation
PlayerAlive
YES IsJoinedToHost
IsAtEnergyLocation
HaveSoundLocation
3. AttackPlayer
LowEnergy
CanSeeEnergy
NO CanSeePlayer
KnowPlayersLastPosition
KnowEnergyLocation
NO PlayerAlive
IsJoinedToHost
IsAtEnergyLocation
HaveSoundLocation

GOAP LOGIC FLOW CHART



FINDING AND COLLECTING ENERGY

Very simple. Will wander to random locations until it sees energy (yellow spheres)

Will add energy to a known location list during any state.

Health will refill once at the energy location.

WIDE AREA SEARCH

Same as finding energy except looking for players.

HEARING AND INVESTIGATING SOUND

Hearing is simple. When a player makes a noise an event is triggered. Enemies will do a distance check to determine whether to respond.

KNOWS PLAYER LAST POSITION

This can handle any number of players. On every AntAI tick a list is built of all players that have known locations, then a closest distance check is calculated and returned.

Enemy will then get a list of all hiding blocks in a circle of that position and travel to each point of the list.

Hearing a sound will interrupt this search. If the hearing fails, this state will continue

This behaviour has a cooldown before going into the wide area search.

PLAYER SEEN - REPORT TO GUNS

Once the player is confirmed, a public static event is called with the player location (from the logic model). The Report player state, simply sets the isPause bool on the guns to false and follows the player..