

# NPC AIs

## Common Characteristics to All AIs

### Noise Reactions

All characters will stop for a few seconds and turn to face the origin of noise stimuli they hear, unless stated otherwise in their current state.

- Guards and foremen will have a bark (accessible in the editor for designers to change) when reacting to a noise, and another for when the time they spend looking at it is close to running out (accessible variable). If they happen to hear another noise while this timer is running, replay the first bark.

**! CAREFUL: DO NOT MISTAKE “SOUND” FOR “NOISE STIMULUS”**

### Awareness

All characters in Pestilence have their behavior ruled by a unique variable called Awareness. This variable can range from 0 to 100, with 0 being its initial value.

- A character’s awareness increases every second that the player stays in its vision cone, unless stated otherwise in their current state (such as Watching and Stunned).
- A character’s awareness drops over time, at a speed determined by their state.
- The amount that a character’s awareness increases every second they see the player is determined by the following formula, which is a function of Player Visibility (V), their Integrity Factor (Fi), and the Vision Quality (C) of the character.

$$\Delta Awareness = V \bullet F_i \bullet C$$

**Vision Quality (C)** Function of the distance range (Dr) and angle range (Ar).

$$C = D_r \bullet A_r$$

- **Distance Range (Dr)** Function of the distance to the player (D) and the maximum vision distance of the character (Dmax).

$$D_r = \begin{cases} 1 & \frac{D}{D_{max}} < 0.5 \\ 0.5 & 0.5 < \frac{D}{D_{max}} < 1 \\ 0 & \frac{D}{D_{max}} \geq 1 \end{cases}$$

- **Angle Range (Ar)** Function of the angle in degrees between the vision axis of the character and the position where it sees the player (A) and the amplitude in degrees of the vision cone of the character (Amax).

$$A_r = \begin{cases} 1 & \frac{A}{A_{max}} < 0.5 \\ 0.5 & 0.5 < \frac{A}{A_{max}} < 1 \\ 0 & \frac{A}{A_{max}} \geq 1 \end{cases}$$

## **Base and Exceptional States**

Every state a character can take will be either base or exceptional.

**Base States** These are based on the current Awareness value. A character will always be in their base state corresponding to their current awareness unless interrupted by an exceptional state.

- For example, a guard will be in the patrol state with low awareness, alert if medium, and chase if high.

**Exceptional States** States which have custom entry and exit conditions and are only accessible from states with lower priority. While a character is in an exceptional state, their current hypothetical base state will still be calculated.

- For example, if a guard in the patrol state sees an infected pawn, they will switch to the distracted state.

## **Common Properties to All States**

**Priority** Every state will be assigned a numeric value indicating the hierarchy between that character's states. A character can only transition to an exceptional state if the target state's priority is higher than the current state's.

**Minimum Duration** Every state will be assigned a numeric value indicating the minimum time a character must stay in that state before being able to transition to a lower priority base state. In base states, awareness cannot drop below the boundary value until this time has passed.

## **Common States to All AIs**

- **Patrol**

Base state. The basic state of all characters, in which they walk to their TargetPoints in order. When returning to this state from any other, they begin by walking to their nearest TargetPoint. This state will always be the one with the lowest priority.

- **Stun**

Exceptional state. When transitioning to the stun state, the character will play their "stunned" animation, and will stay static, deaf, and blind for the duration.

- This state will always have the highest priority.
- Common entry conditions: Character is stunned via a takedown.
- Common exit condition: Stun timer expires (dependent on AI type).

## **Witness Condition**

- If a pawn or a guard enters their fleeing or chase state, they will become a witness.
- This is indicated with an icon above their heads.
- If a character is a witness, their effective Integrity Factor will always be 1.
- If the player possesses another pawn, all witnesses will stop being witnesses.

## About Doors

When making a pathfinding calculation, characters will check if the path passes through a door. If it does, they ask:

- Is the door blocked/needs to be forced in the direction I want to cross it?
  - If it is, they redo the calculation, avoiding the door. If after x (currently 5) retries the character can't find a valid route, the guard becomes static for 20 seconds, and retries the calculation after.

## Subtypes

