

AI Perception, PawnSensing & Pursuit System

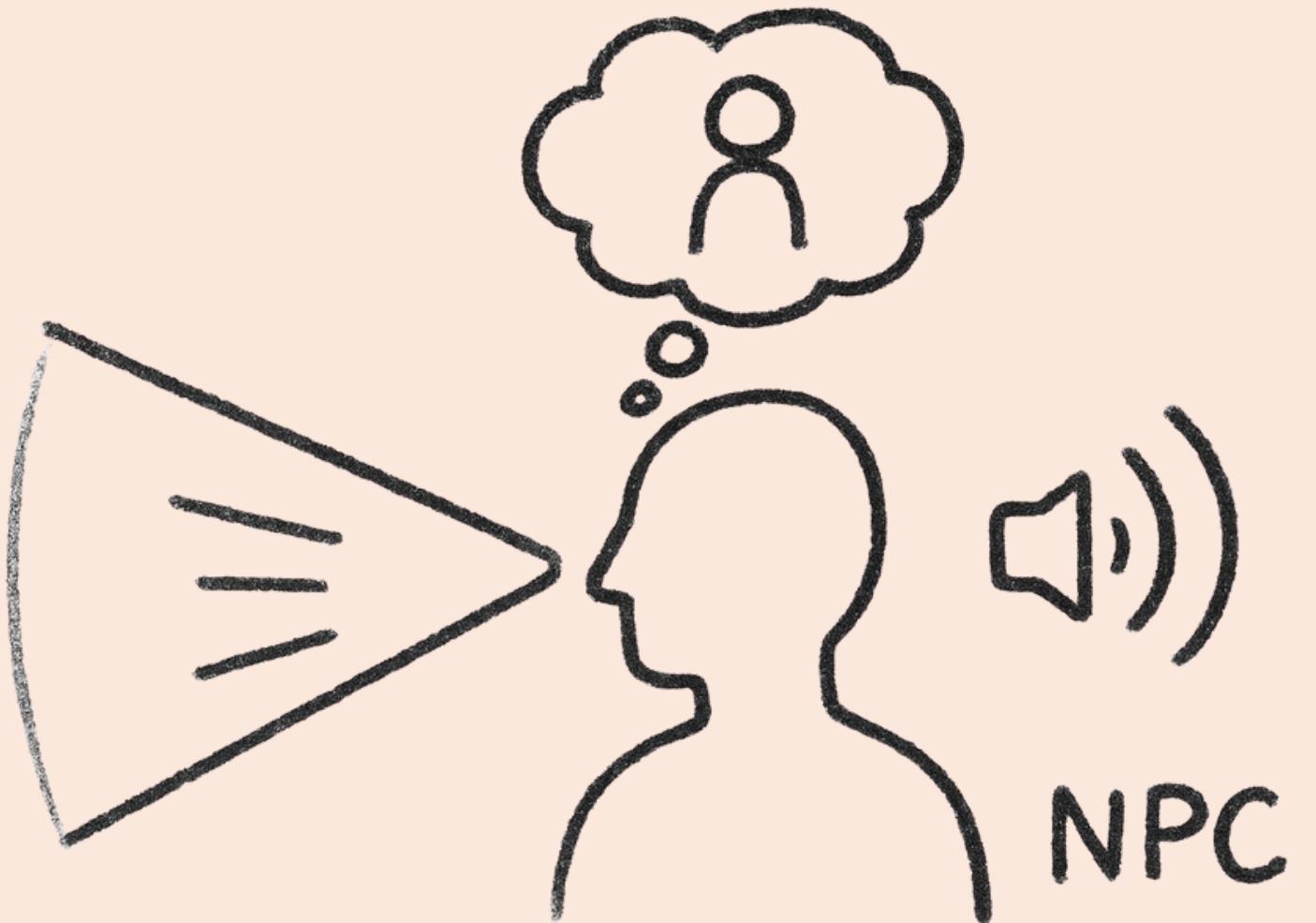
Behavior Trees & AI Decision-Making

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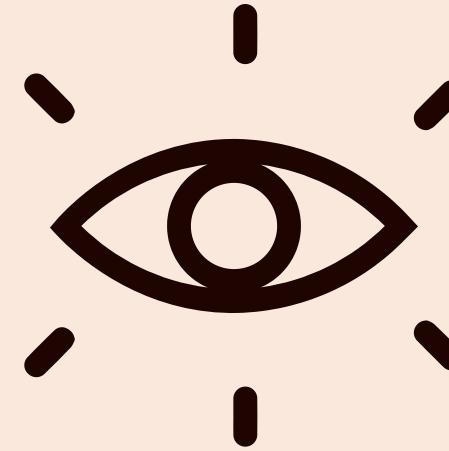
Why NPCs Must “See” the World

- *NPCs act on sensed data*
- *Perception defines what the AI knows*
- *Poor sensing → unintelligent behavior*



Vision, Hearing, and Awareness Sources

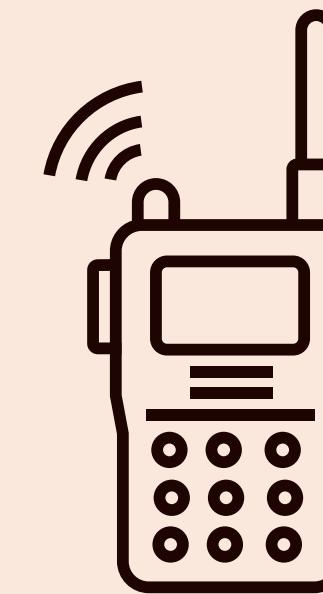
- *Vision: FOV, distance, occlusion*
- *Hearing: noise events + falloff*
- *Alerts: shared knowledge (e.g., squad calls)*



Eye (Vision)



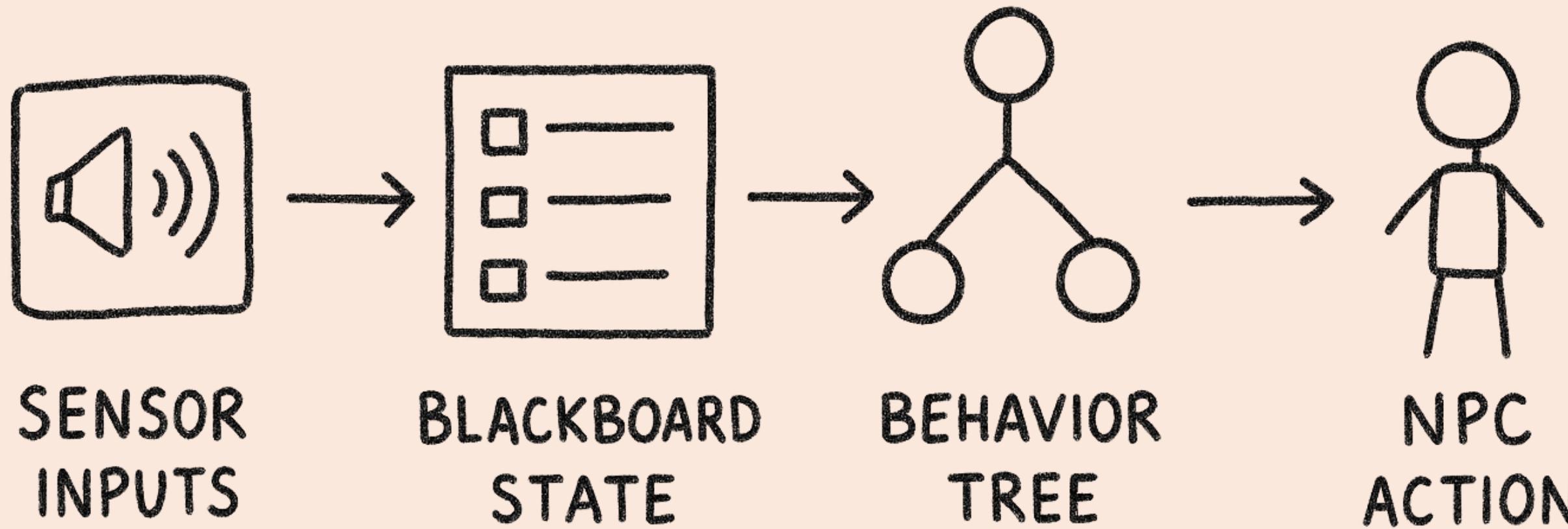
Ear (Hearing)



Shared Alert

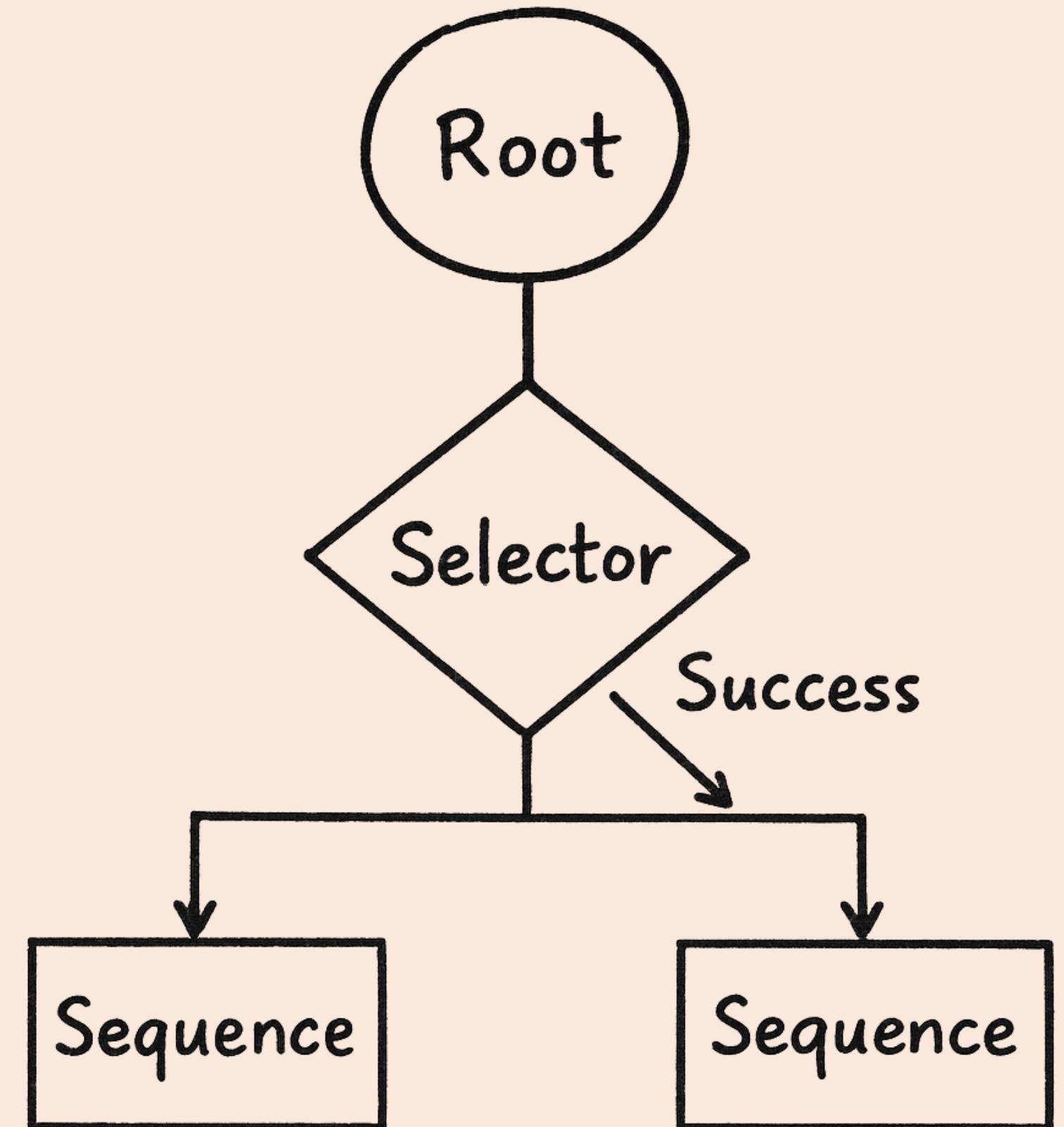
The AI Pipeline

- *Collect signals*
- *Update blackboard/state*
- *Select behavior tree branch*



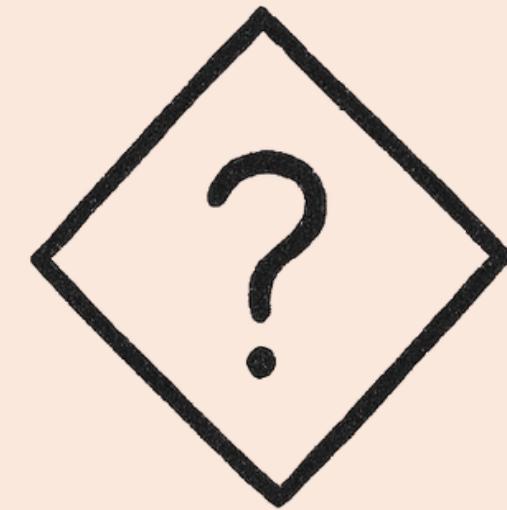
Behavior Trees as Modular AI Logic

- *Hierarchical decision structure*
- *Nodes run children in order*
- *Returns success / failure / running*

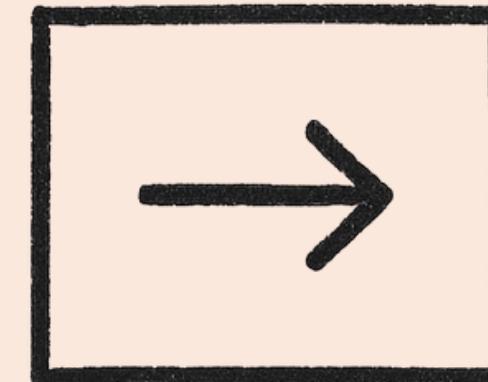


Selectors, Sequences, Decorators

- *Selector: pick first success*
- *Sequence: run steps in order*
- *Decorator: add conditions/timers*



Selector



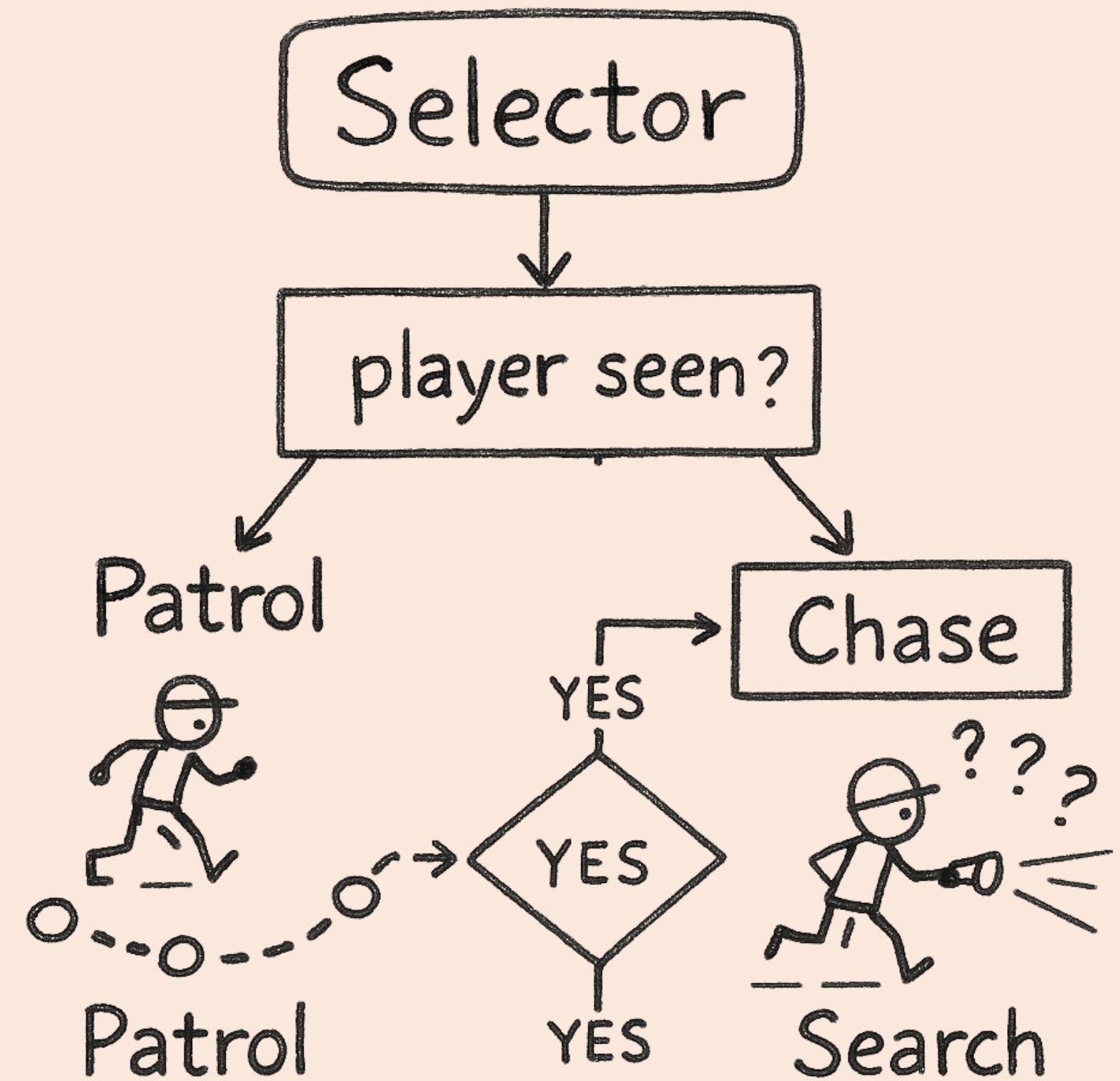
Sequence



Decorator

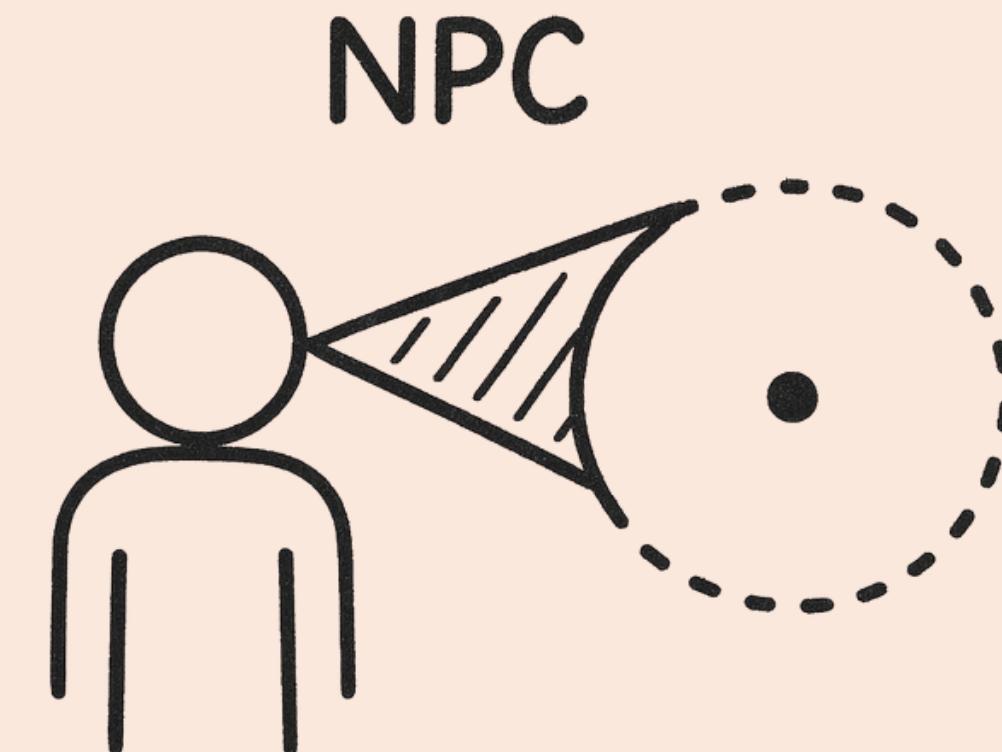
A Common NPC Loop

- *Patrol as default state*
- *Chase if player detected*
- *Search when LOS lost*



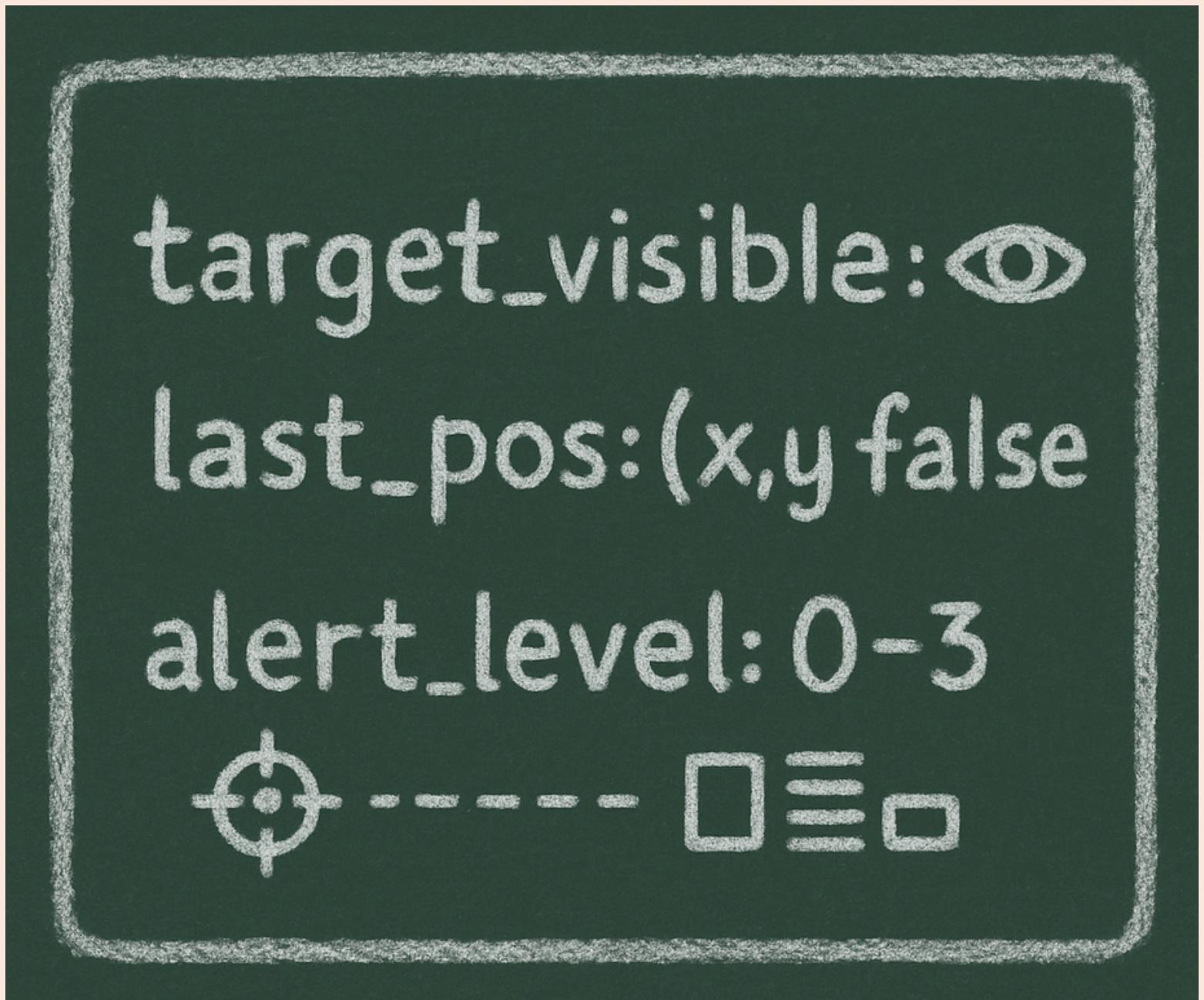
How Detection Adjusts Actions

- *Range + angle determine chase trigger*
- *Noise can override vision*
- *Memory: last-known-position*



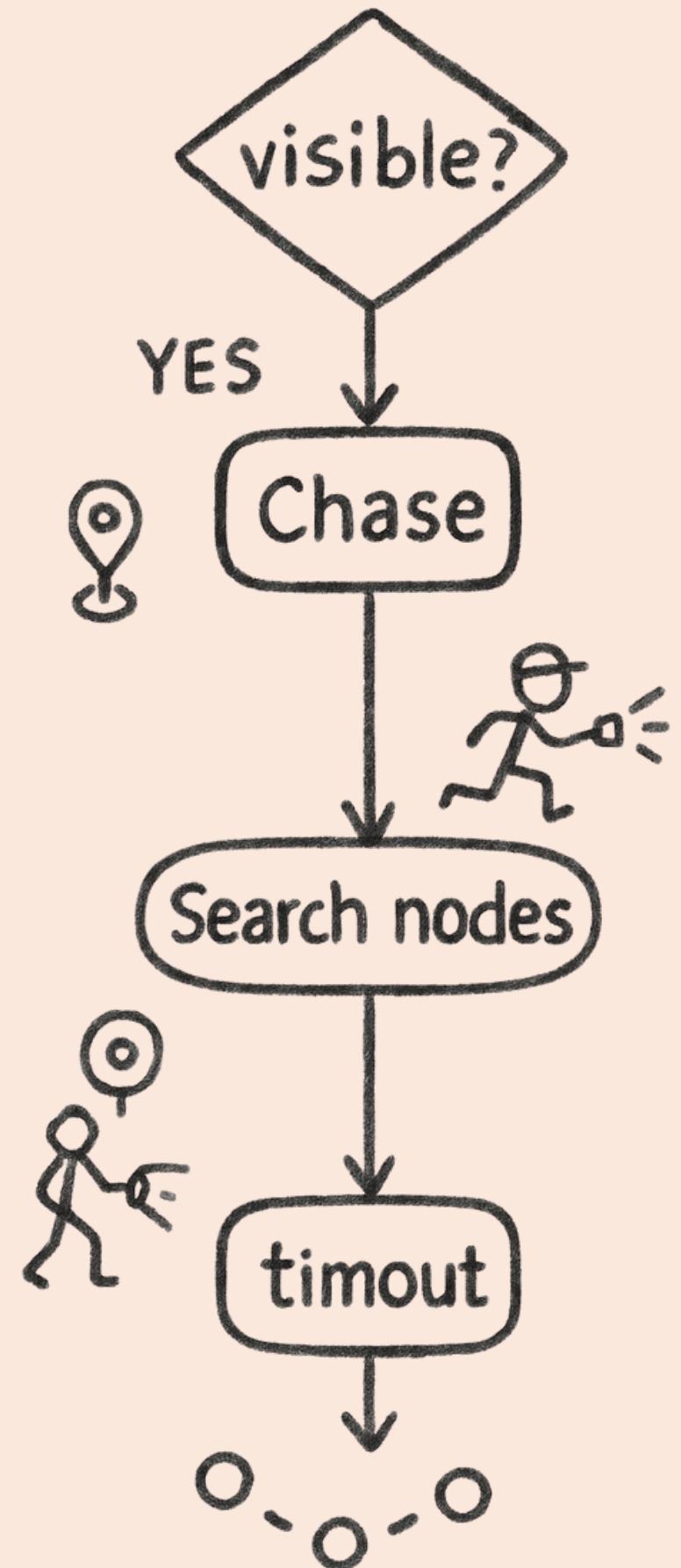
Blackboard Memory for Pursuit

- Stores stimuli info
- Tracks target position
- Drives BT branching



Decision Conditions for Chase

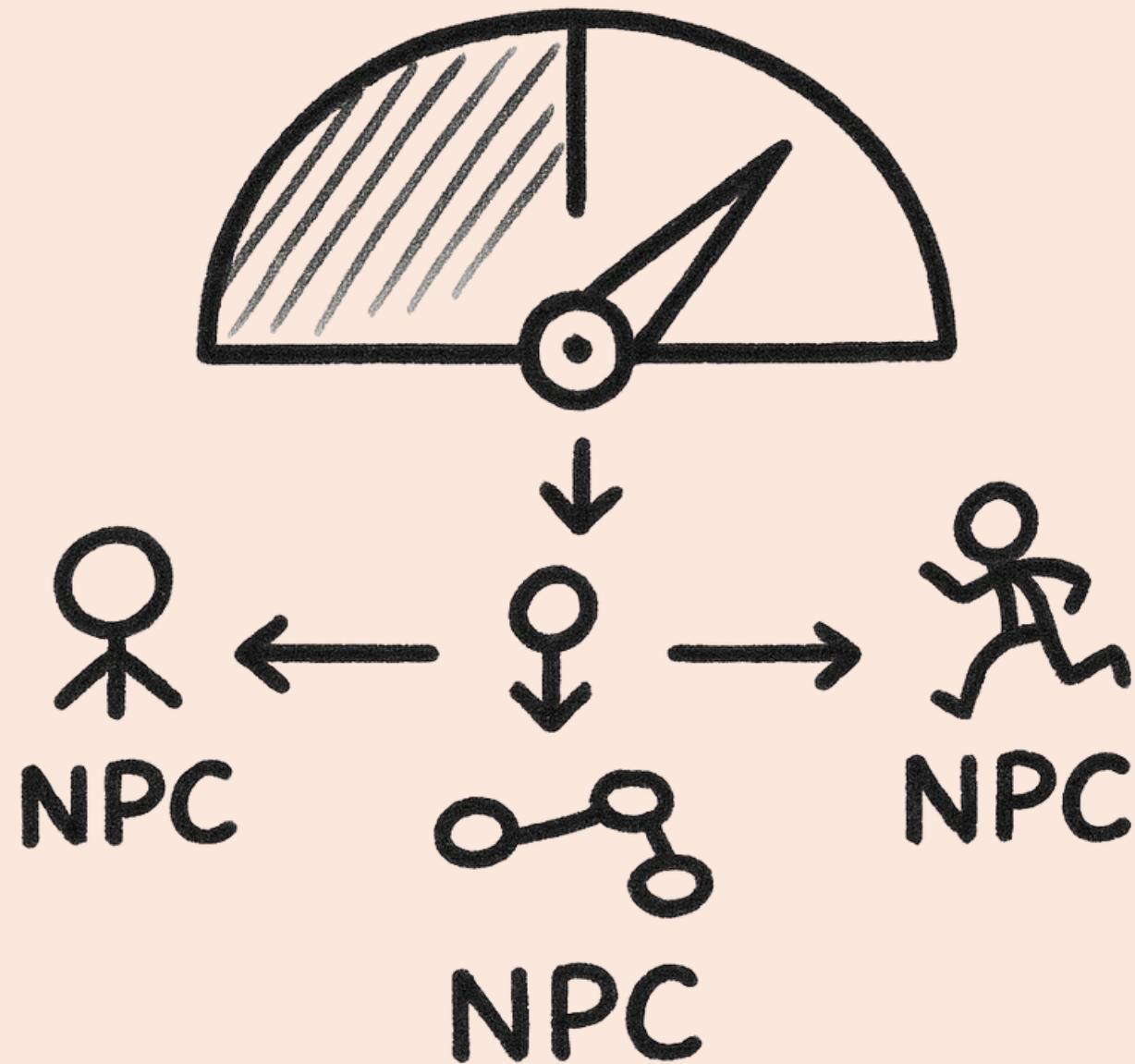
- *If visible → chase*
- *If not → move to last-known*
- *If search fails → return to patrol*



Fine-Tuning Realistic Behavior

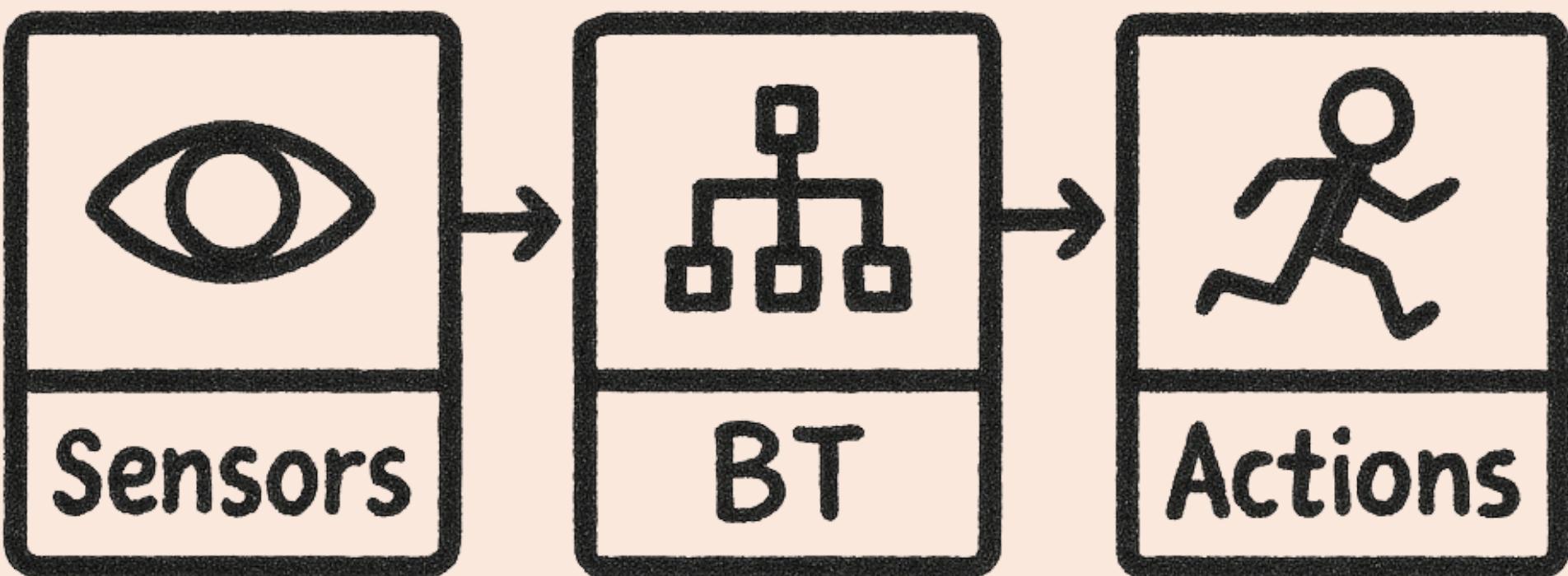
- *Field-of-view smoothing*
- *Memory decay*
- *Alert propagation*

Awareness



Perception → Behavior Tree → Action

- *Perception feeds the blackboard*
- *BT structure selects behavior*
- *Good sensing = believable NPCs*



Exercise

- *Exercise 1: Change the chase distance to 1000 units*
- *Exercise 2: Create a second enemy type with different settings*