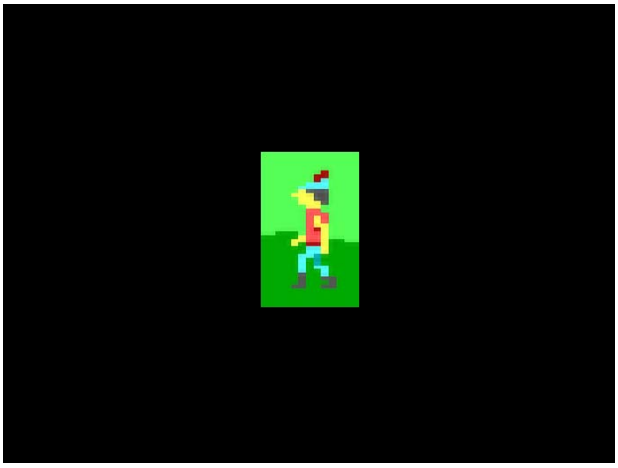
Actors and Interaction

"Stories are about the most fascinating thing in the universe: people."
– Chris Crawford

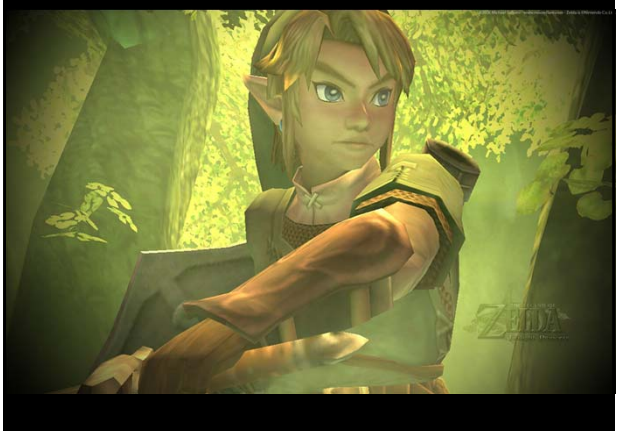
Vogler's Narrative Archetypes

- Hero
- Herald
- Mentor
- Threshold Guardian
- Shadow
- Trickster
- Shapeshifter

Lead Roles in Games



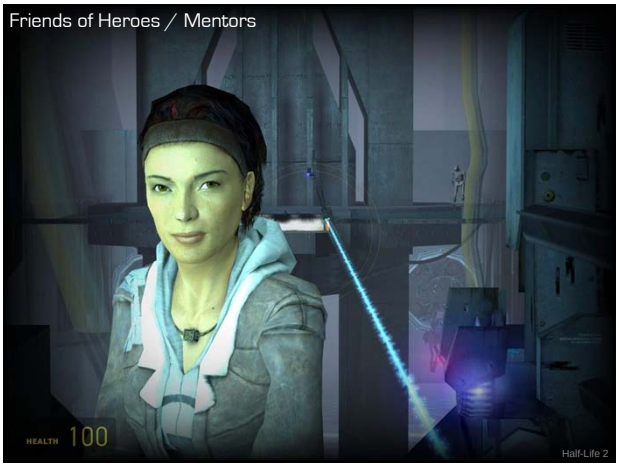
Heroes



Heroes

Heroes (?)

Friends of Heroes / Mentors



Heroes and their Enemies

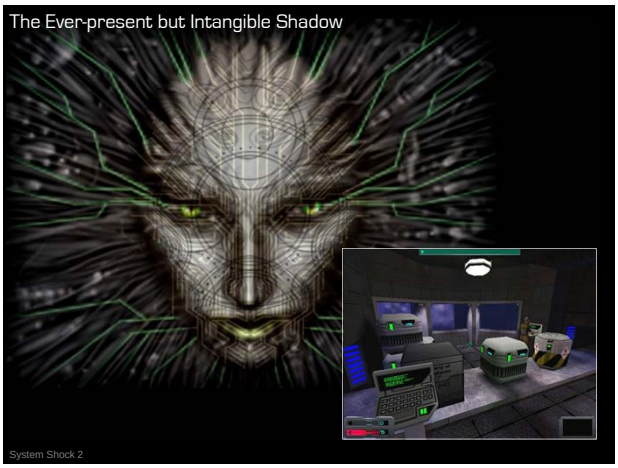
Pacman

Speaking of Enemies…

Threshold Guardians

Shadow of the Colossus

The Ever-present but Intangible Shadow

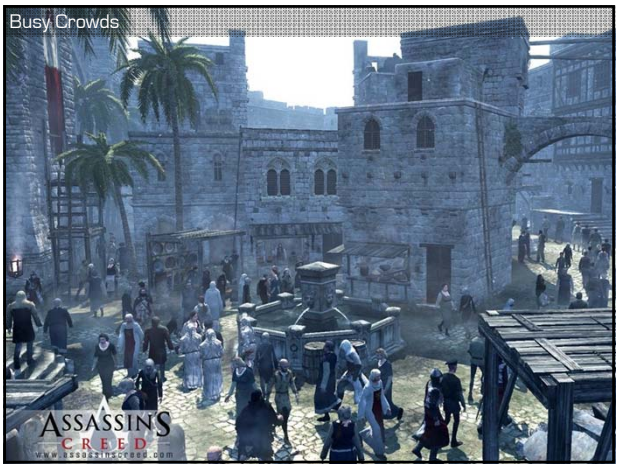


System Shock 2

The Sympathetic Enemy / Shapeshifter

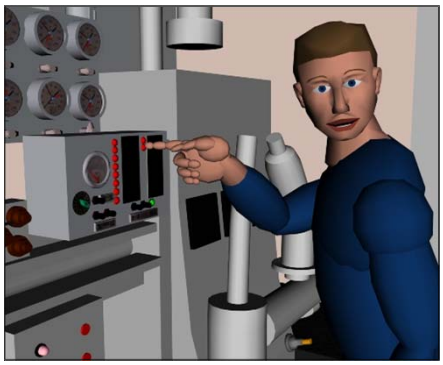
Bioshock

Lesser Actors



But Not Just Games

Tutors and Instructors



STEVE Shipboard Training

Interface Agents

REA – Natural Interface to a Real-estate Database

Pedagogical Drama

Carmen's Bright IDEAS

Simulated People

Tactical Iraqi

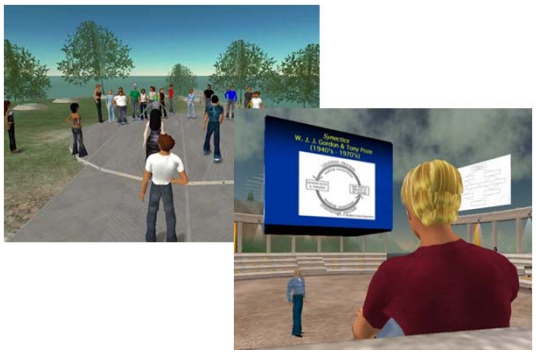
Guide Characters

Tactical Pashto

Historic Figures and Story Characters

H.C. Andersen, NICE Project

Online Avatars



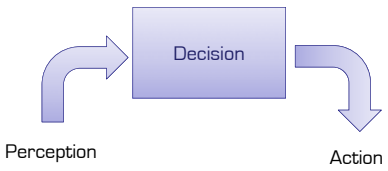
Second Life

Making Them Act

Autonomoy of Actors

Follow a Script ⟷ Make Decisions

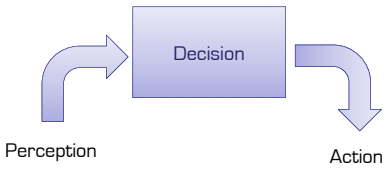
Perception Action Loop



Perception Action Loop

Lookup

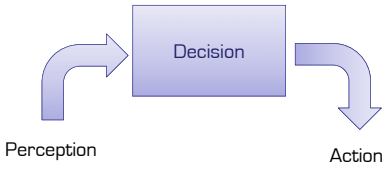
P1 –> A1
P2 –> A2
P3 –> A3
…



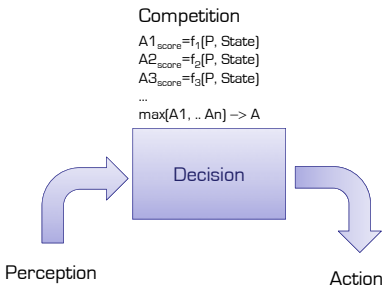
Perception Action Loop

State Machine

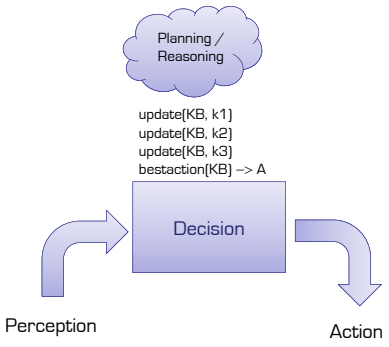
S0 + P1 –> A1 + S1
S1 + P2 –> A2 + S2
S2 + P2 –> A3 + S2
…



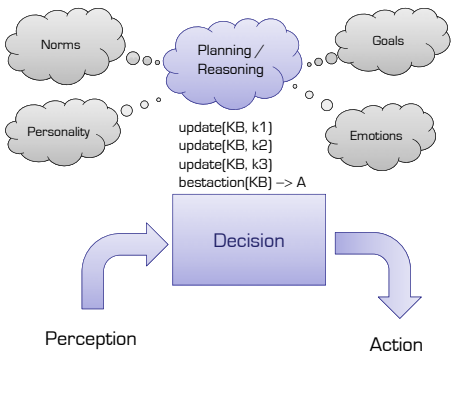
Perception Action Loop



Perception Action Loop



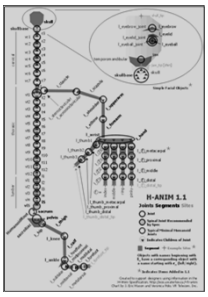
Perception Action Loop

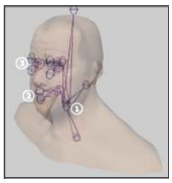


Visible Action

- The chosen action of an actor manifests itself typically as visible behavior at some point.
- The behavior will be performed by an articulated body, typically human-like in appearance.
- The movements communicate the inner world of the actor.
- Any movement or lack of movement that is not consistent with that inner world, destroys the credability of that actor.

But it's very hard to control a visible body



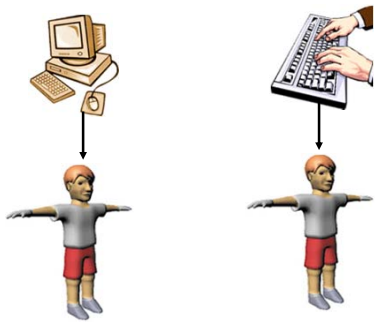


- Over 230 joints
- Over 50 muscles in face
- And we never stop moving!

Humans control it with little effort

© Josh Lerner

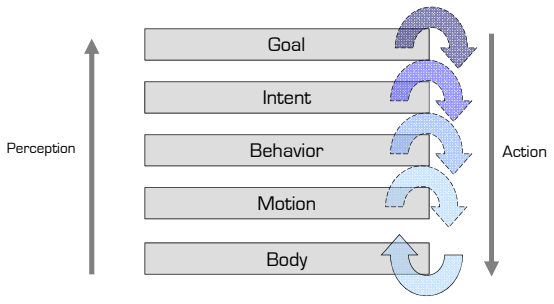
But hard for computers and "players"



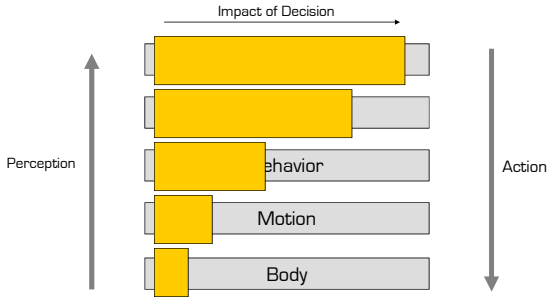
How do we make it easier?

The answer is a layered approach

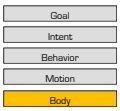
Layered Control: Many Perception Action Loops



Spread the Intelligence (in yellow)



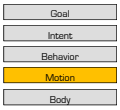
Body (physics)



- Knows its location and configuration
- Knows its limits
- Knows if it's touching something
- Knows what's perceiveable
- Can balance itself

• Example: I bumped into another person!

Motion (Dynamics)



- Knows what joints are needed
- Knows how joints can move
- Can maintain itself
- Can blend with other motions
- Can synchronize with environment

• Example: Eyes track an object

Behavior (Performance)

Goal
Intent
Behavior
Motion
Body

- Knows what motions are needed
- Knows which motions are most important
- Knows if the behavior succeeded
- Can change if needed

- Example: Point at instruments
- Example: Nod the head

Intent (Cognition Level1)

Goal
Intent
Behavior
Motion
Body

- Knows what behaviors help intent
- Knows what behaviors are permissible
- Knows the social context
- Can try something different if behavior fails

- Example: Start conversation
- Example: Reach the tower

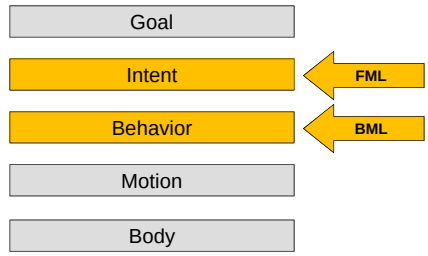
Goal (Cognition Level 2)

Goal
Intent
Behavior
Motion
Body

- Knows what intent is most useful
- Knows intent of others
- Knows needs, desires, emotions, personality…
- Can evaluate progress towards goals

- Example: Tell john about the lottery!
- Example: Defeat the enemy

New Standard Interfaces



Summary of layered approach

- Intelligence is spread across layers, with higher concentration at the top and lower concentration in the graphics hardware at the bottom.
- Interfaces between layers: As well as being the glue holding a character together, they provide
  - scripting opportunities
  - sharing of standard components (e.g. “engines”)
  - different levels of control (e.g. Player vs. NPC)