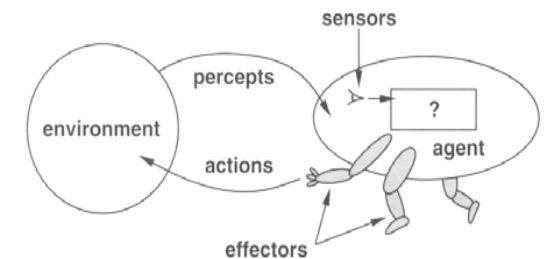


# High level software control loop

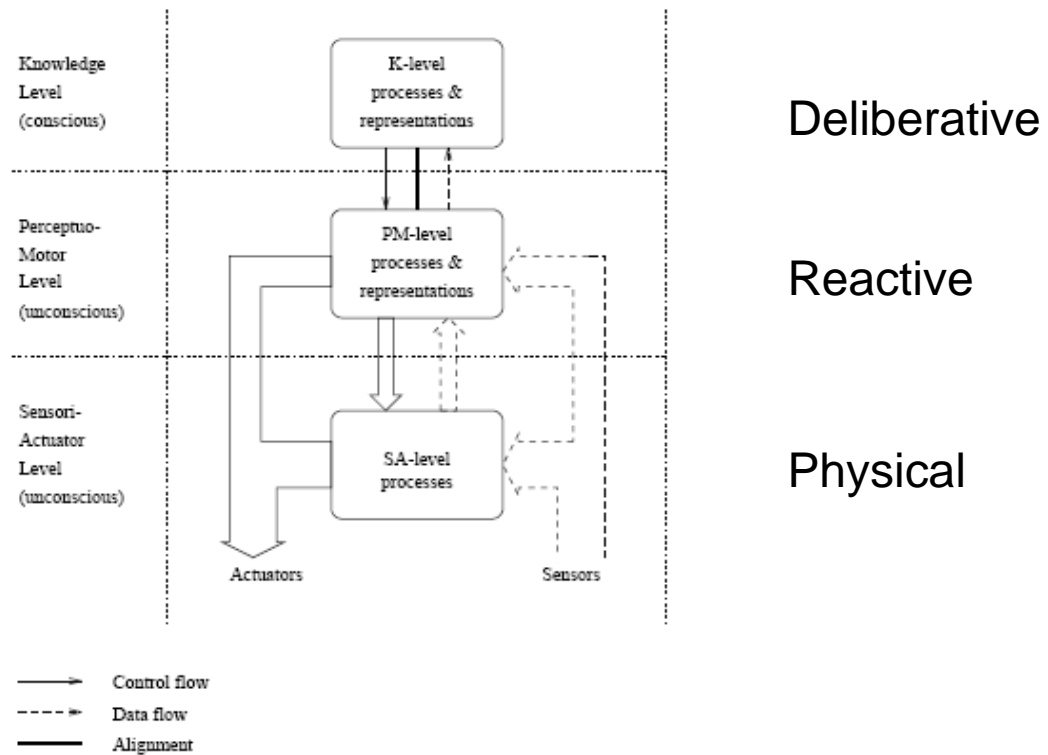
1. While true {
2. **Sense** the world– (a) sensors, (b) communication, (c) supervisor input
  1. Form perceptions– (a) concept triggering, (b) proprioception
  2. update beliefs (belief revision)
  3. update internal world model– (a) map, (b) localization, (c) relationships and attributes
3. **Think** about options, desires, intentions, and actions
  1. Revise desirable options and select one
  2. Deliberate about what intention to achieve next;
  3. Revise and update plan
  4. use means-ends reasoning to get a plan for the intention;
4. **Act**
  1. Revise intentions and select an intention to manifest
  2. execute the plan
  3. Suppress less important behaviors
  4. Start control of actuators
5. **Pause**
  1. until the world changes
  2. Communicate
  3. Generate and deliver user feedback
- }

*The-  
Frame problem  
Action selection problem  
Replanning problem  
Environment problem*



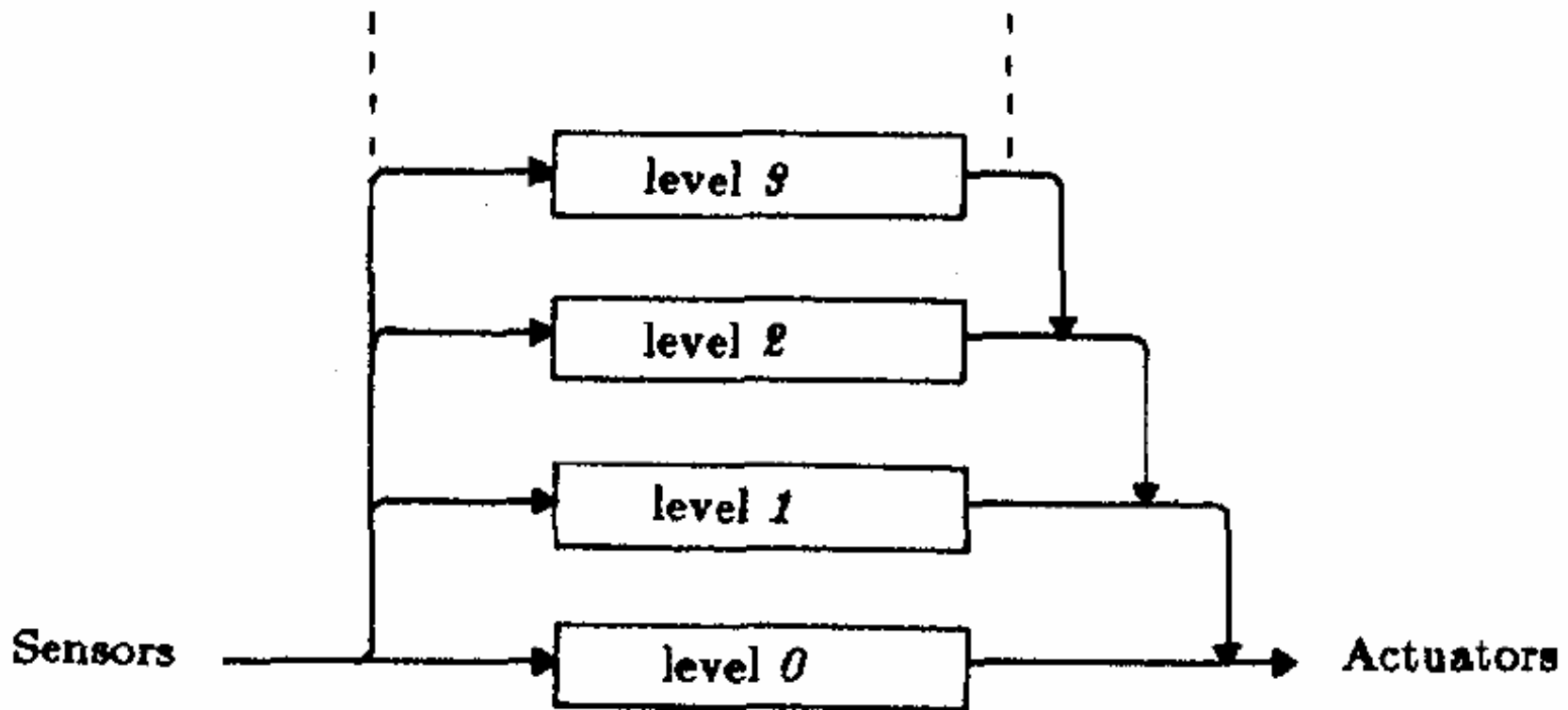
Henry Hexmoor, 2008

# Multilayered Architectures...



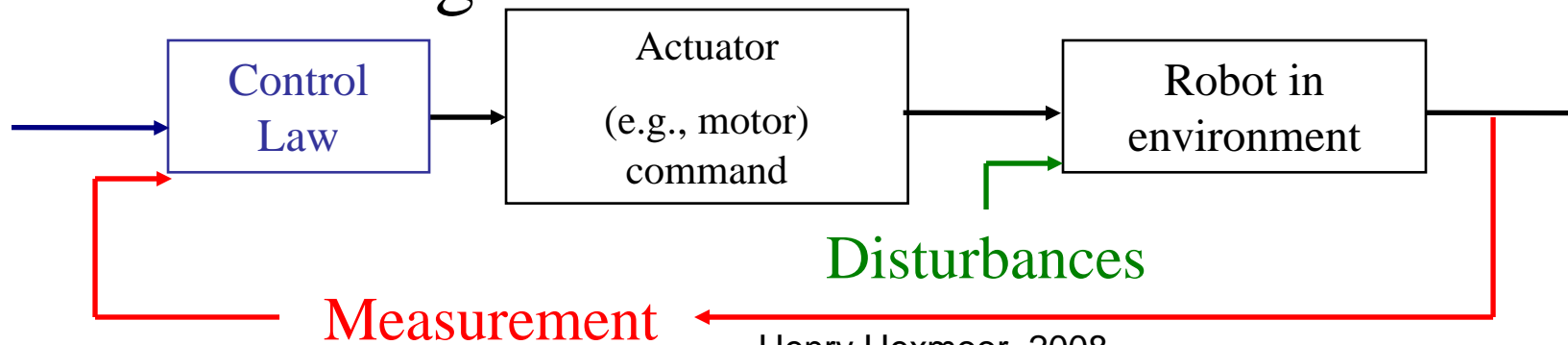
Henry Hexmoor, 2008

- Rather than sensor fusion, we have behavior fusion
- Fusion happens at the action command level on the right
- A kind of behavior arbitration is performed



# Servo level: “PID” feedback Control

- P: controller output is proportional to the error or change in measurement
- I: controller output is proportional to the amount of time, error is present.
- D: controller output is proportional to the rate of change of measurement with time



Henry Hexmoor, 2008