

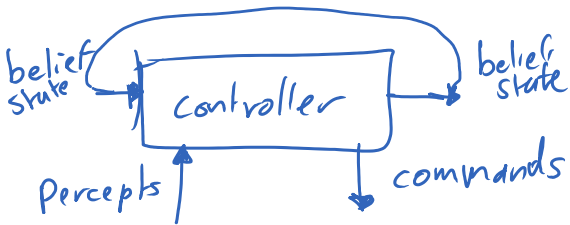
• Note: body can act without being controlled

Controller: - Inpt. - history:  
 - all previous percepts  
 - all previous commands  
 Output: -  
 - current command.  
 "causal transduction"

• But: controllers have limited Memory & limited Computational Capacity.

decide - what part of history to remember?  
 How to encode it?

Belief State / Memory



Controller: 2 Functions  
 Belief state function  
 $bsf(\text{belief-state}, \text{percept}) : \text{belief-state}$   
 Command Function  
 $cf(\text{belief-state}, \text{percept}) : \text{command}$

Note: Reactive Agent  
 No Belief State.  
 Dead Reasoning Agent  
 No Percepts.

Agent:



- percepts: - Time temperature, empty?, fridge sensor, ice-cream.  
 - commands: - control AC ; order ice-cream.  
 - History: - All previous temp. ... sunk

All previous ice-cream stuff

- Belief state? = remember last month.

- avg of when house is empty  
when house is occupied.

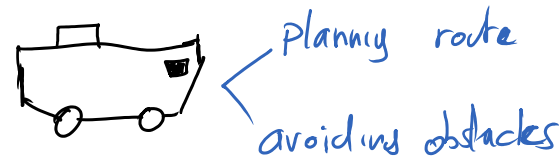
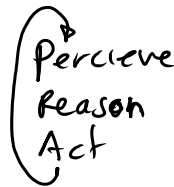
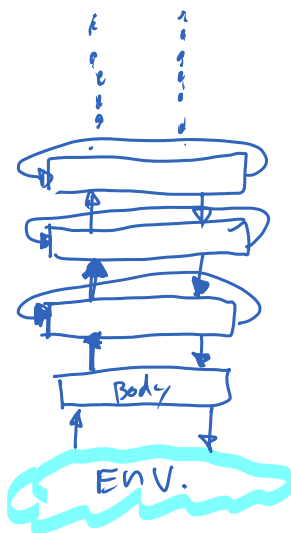
- Control function:-

if (ice-cream  $\leq 0$ ) then order ice-cream

if (empty?) then = 85;

if ( $\neg$ empty?) then = 75;

## Hierarchical Controllers.



3 - Functions:-

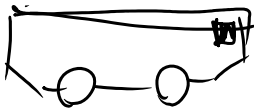
Belief state function:-

(belief\_state, percept, command) : belief state

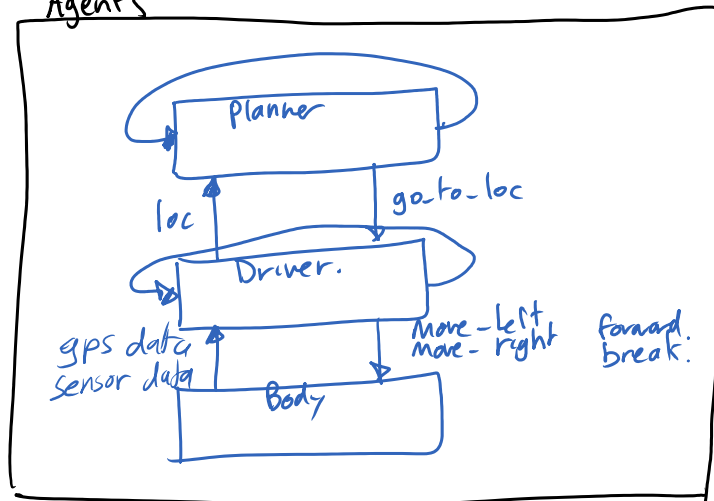
Command function  
(belief\_state, percept, command) : command

percept function  
(belief\_state, percept, command) : high level percept

Example:



Agents



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Nasg  
Plan 18. Hardware & Software.