Agent Architecture

**Agent**

**Controller**

- **Percepts**
- **Stimuli**
- **Commands**
- **Actions**
- **Environment**

- **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**
  
  \[ \text{bsf}(\text{belief\_state, percept}): \text{belief\_state} \]

- **Command Function**
  
  \[ \text{cf}(\text{belief\_state, percept}): \text{command} \]

**Note**: Reactive Agent

- No Belief State.
- Dead Reckoning Agent
- No Percepts.

**Agent**:

- **Smart House**

- **Percepts**: 
  - temperature, empty? , fridge sensor
  - ice-cream.

- **Commands**: 
  - control AC
  - order ice-cream.

- **History**: All previous temp. ... suck
Hierarchical Controllers.

- Belief state? = remember last month.
  - avg of when house is empty when house is occupied.

- Control function:
  - if (ice-cream ≤ 0) then order ice-cream
  - if (empty?) then = 85;
  - if (!empty?) then = 75;

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

- Planner
- Driver
- Body

loc
- go_to_loc

gps_data
- sensor_data

more_left
- move_right
- forward
- break
Nasg
Plan 18. Hardware & Software.