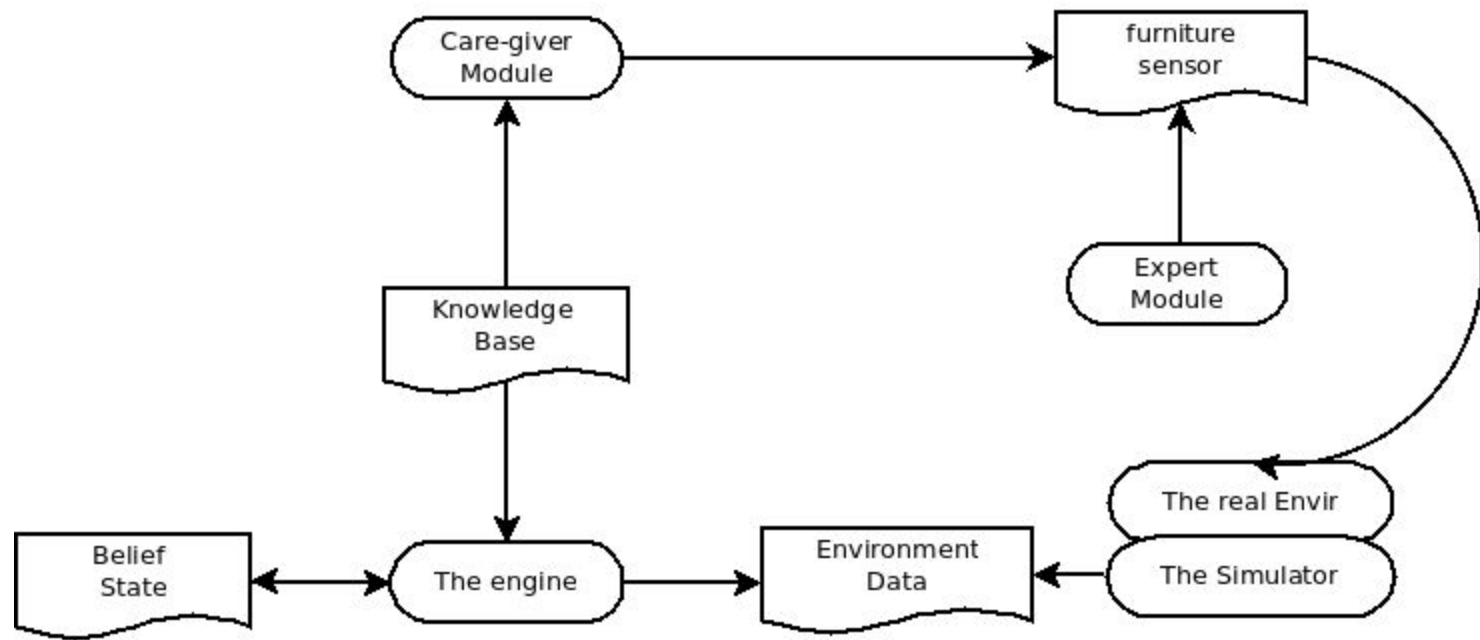
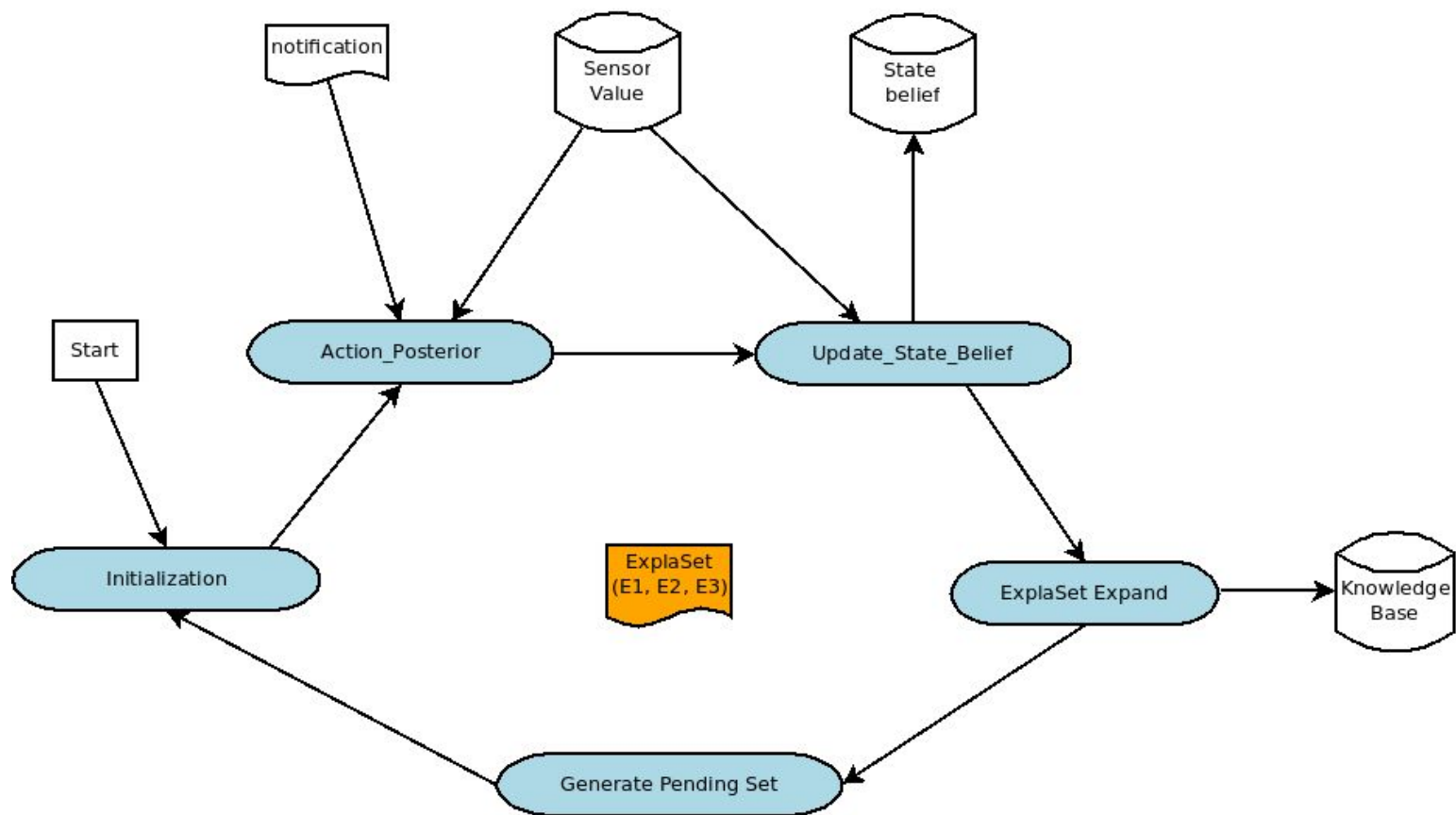


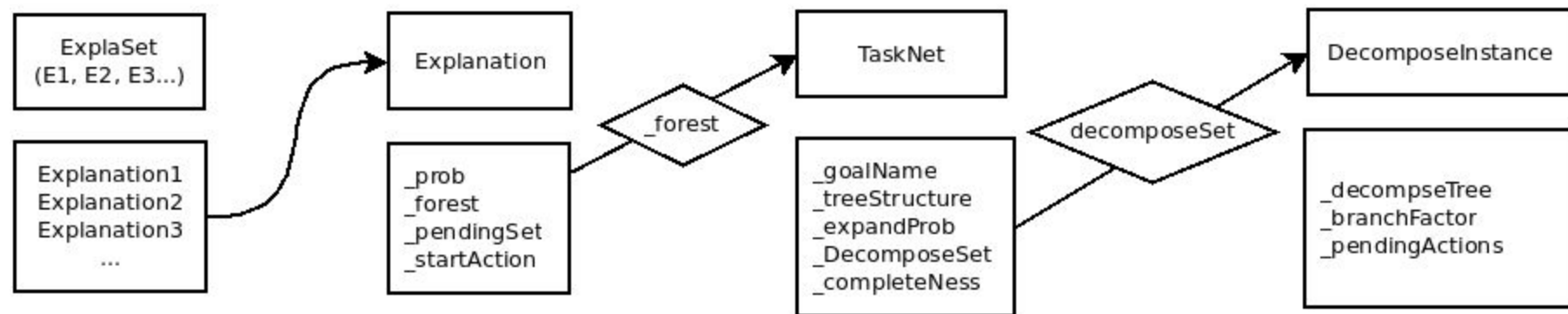
## Overall Architecture



## GENERAL PROCEDURES



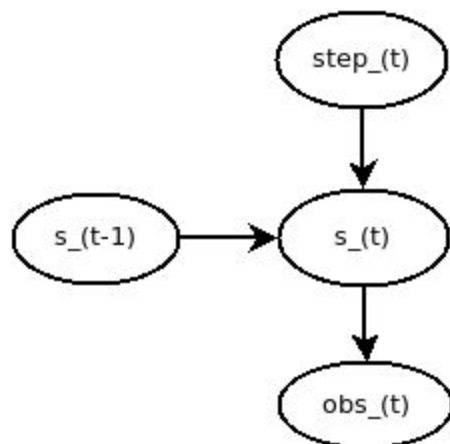
## DATA STRUCTURE



STEP LEVEL

$$p(\text{step}_t \mid s_{t-1}, \text{obs}_t)$$

$$p(b_t)$$



## ALGORITHM FUNCTION

### Consider the reliability of sensors

- (1) action\_posterior (not evenly distributed)
- (2) belief\_state\_updating (the paper need not consider)

### Consider "Operator" and "Method" precondition

- (1) depends on belief state
- (2) branching factors of decomposition is calculated based on precondition checking.  
(the paper using evenly distributed)

### Consider the case of "noting happened"

- (1) This is a side-effect of consider sensor reliability

## ASSUMPTIONS

- (1)  $P(\text{explanation}) < \text{drop\_threshold}$ , drop this explanation
- (2) At each iteration, at most 1 step happens  
(nothing happen or one step happen)
- (3)  $p(b\_t | b_{t-1}, a_t)$  defined based on precondition satisfying

## ALGORITHM PROBLEMS

- (1) probabilities of inner nodes?
- (2) durations of steps.
  - > immediate effect -> delayed effects
  - > delay belief state update for delayed effects
- (3) Intervals between steps
  - > used to decide when to provide prompt.
- (4) Repeat a step. (Step A->Step B)
  - > Step A completed
  - > Step B didn't start within required time.
  - > Need to repeat step A...
  - > But the tree structure will not allow return to Step A

## PROBLEMS In CARE-GIVER MODULE

- (1) Generate necessary preconditions for higher level tasks based on the preconditions of the lowest level steps
- (2) Check the correctness of domain knowledge and give necessary guidance to ask the caregiver correct the knowledge base.
- (3) Generate domain knowledge in the format that the goal recognition engine required.
- (4) Avoid duplicate domain knowledge input.  
e.g. Some goals shares some subtasks.
- (4) New sensor register