

Tilsapa – Timed Initial Literals Using SAPA

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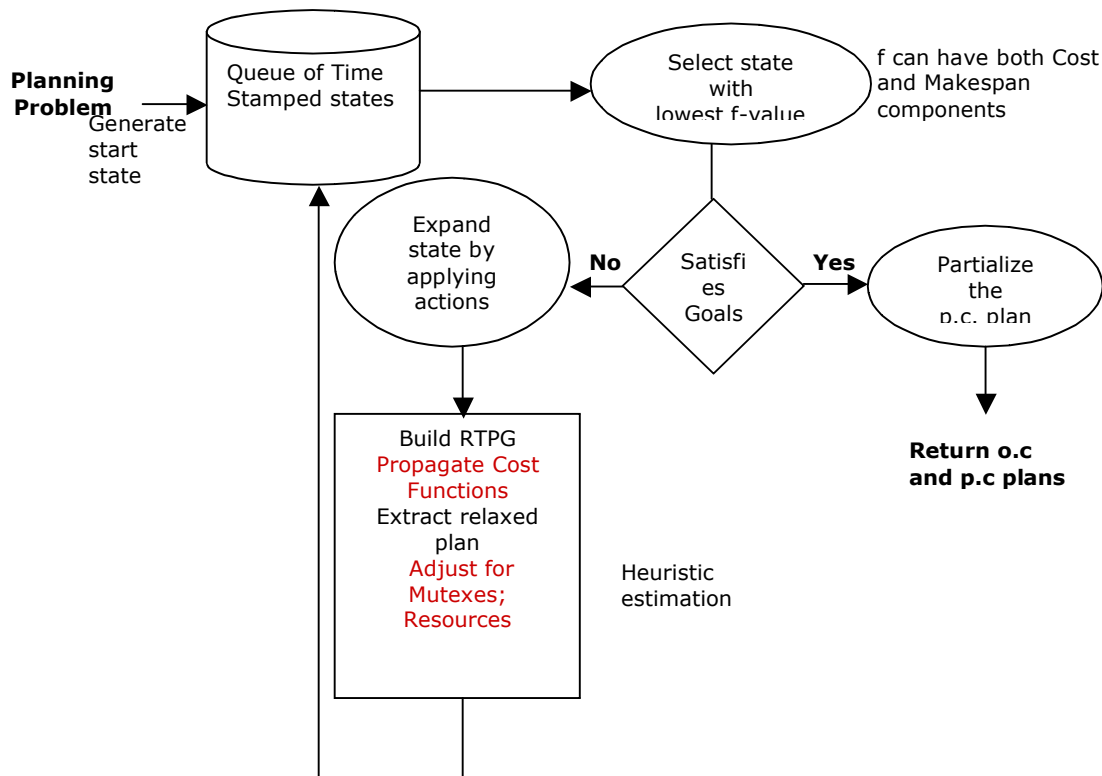
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System Abstract

This system is an offshoot of SAPA[1] developed by Binh Minh Do and Subbarao Khambampati. The following diagram represents the architecture of SAPA.



[1]Architecture diagram of SAPA

A time stamped state can be described as a quintuple $S = (P, M, \Pi, Q, t)$ where

$P = \text{Set } \langle p_i, t_i \rangle$ of predicates p_i and the time of their last achievement $t_i < t$.

$M = \text{Set of functions representing resource values.}$

$\Pi = \text{Set of protected persistent conditions}$

$Q = \text{Queue of future events}$

$T = \text{Time stamp of } S [1]$

- Timed Initial Literals are implemented using SAPA by the following method
 - Include them in the event queue at the outset (Plan request)
 - Include them in the predicate set P before the state is expanded by applying new actions
- Derived predicates can be introduced before any action is considered into the set of Predicates, which are valid for the current state.
- Constants are included with each plan request as initial predicates.

The major bottleneck is the heuristic computation and propagation of the cost where

- it is assumed that each predicate can only be caused by an action.
- the heuristic value of the state is a function of
 - Cost of the relaxed plan from this state to the goal state.
 - Makespan of the relaxed plan.

We are currently working on optimizing the cost propagation process after taking the timed initial literals into consideration. The system is still under implementation.

References:

[1] Do, M. and Kambhampati, S. (2003) "SAPA: A Multi-objective Metric Temporal Planner", Journal of Artificial Intelligence Research, Volume 20, pages 155-194.