6.0 Acknowledgment

[illegible]

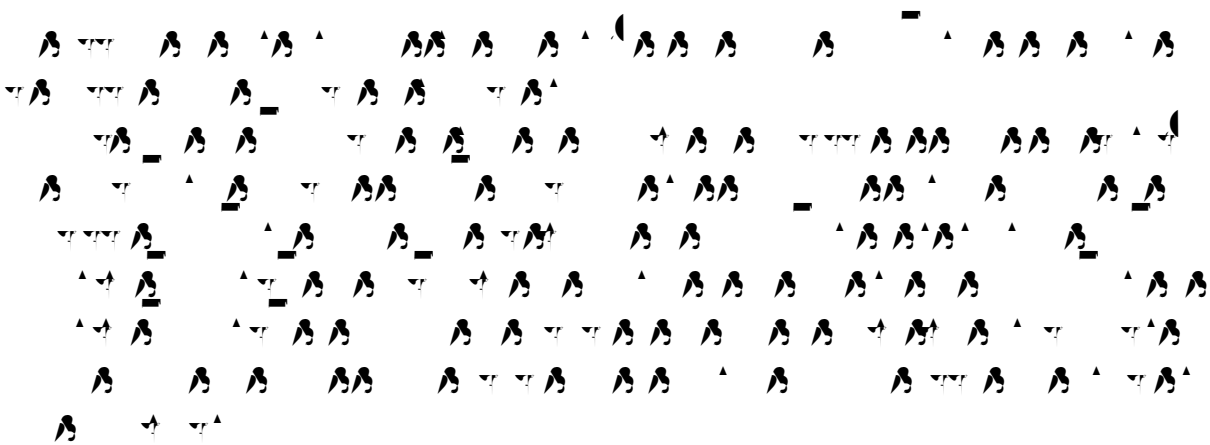


Figure 4 Goal Feasibility Assessment Sample Process Run

The goal is evaluated as doable if a plan is found and if the hard constraints of the plan are satisfied.

Obtaining prior information through the satisfaction of hard constraints enables the agent to obtain an early decision about the fate of the plan.

Figure 3 Outline of the Goal Feasibility Assessment Control Algorithm

5.0 Summary, Conclusion and Future Work

checkVerity

checkVerity

or

and

verifyMaintainAchieve checkVerity execute executeWhile executeUntil, wait, waitWhile, waitUntil

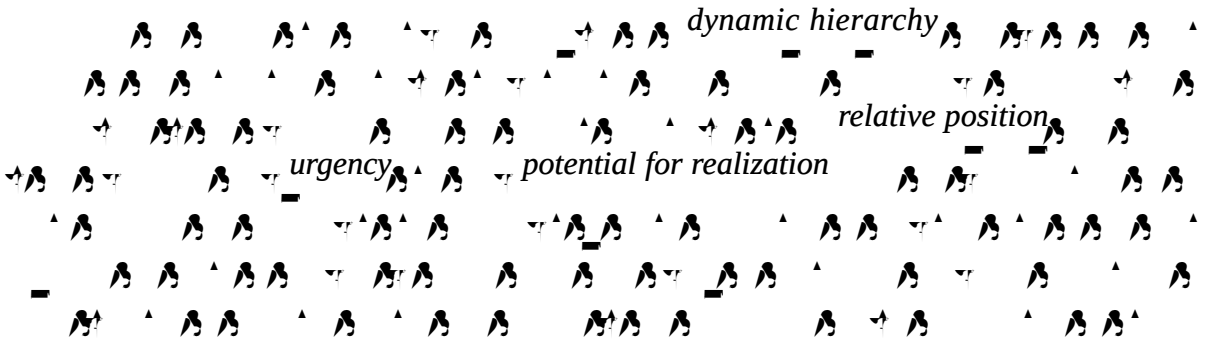
verifyMaintainAchieve

execute executeWhile executeUntil

wait, waitWhile, waitUntil

updateBeliefs

4.0 Control Strategy


dynamic hierarchy
relative position
urgency
potential for realization

3.0 Knowledge Base: Nature and Representation

beliefs *, causal effects* *goals* *plans*

3.1 Beliefs

object-property-value *state ,* *degree of confidence*

3.2 Causal Rules

3.3 Goals

purposive system *Goals* *prescribed* *self-formulated* *multiple occur simultaneously* *interact with each other*

[illegible]

[illegible]

2.0 System Architecture

plan of action

satisfaction of hard constraints

1.0 Motivation

1) goals of the agent are (often) multiple and may occur simultaneously, and 2) agents are resource-bounded *are destined to fail or prove to be inconsequential to the greater benefit of the agent and its environment* *"knowing what goals it can currently achieve and what its choices are for action"* *goal feasibility assessment*

doable *rational.* *capability* *knowledge* *contribute positively*

Goal Feasibility Assessment: Architecture, Representation and Control Strategy

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Abstract

This paper posits the idea of goal feasibility assessment, a reasoning mechanism that is intended to give the agent the consciousness to decide early and rationally on the fate of its goals. It may be described as a reasoning process for evaluating whether an agent's detected goal is possible (or doable) and rational (practical) to achieve. The doability of a goal is evaluated based on the capability and knowledge of the agent to pursue the goal as well as the satisfaction of resource and situational constraints pertinent to the achievement of the goal. On the other hand, the rationality of pursuing a goal is assessed based on the net total benefit (or net utility value) attributed to the agent and its environment when a goal is successfully achieved.

In addressing the issue of goal feasibility assessment, this paper seeks to determine the nature and representation of knowledge that the agent requires in assessing the feasibility of its goals. It also aims to define a control strategy for goal feasibility assessment and provide a supporting architecture. In brief, goal feasibility assessment shall be addressed through architecture, representation and control strategy.

The system architecture consists of a knowledge base and seven processors, namely: Urgency Evaluator, Planner, Plan Searcher I, Plan Searcher II, Hard Constraints Satisfier, Utility Assessor and Best Plan Selector. The knowledge base contains the nature and structure of knowledge that the agent requires for assessing the feasibility of a goal. This includes the detected goals, causal rules, existing plan library, current beliefs, built-in operators library and active plan options.

The goal feasibility assessment control algorithm consists of three stages. Plan generation/search and urgency evaluation are processed in the first stage; hard constraints satisfaction and computation of expected utility value for each alternative plan are undertaken during the second stage; and selection of the best plan for the goal is done in the third stage.