device functions. We make four important contributions. First, we present a representation of class level
descriptions of model fragments and their relationships. The representation yields a practical model fragment
library organization that facilitates knowledge base construction and supports focused generation of device
models. Second, we show how the structural, behavioral, and functional contexts of the device define model
adequacy and provide the task focus and additional constraints to guide the search for adequate models. Third,
we describe a novel model selection algorithm that incorporates device behavior with order of magnitude
reasoning and focuses model selection with component interaction heuristics. Fourth, we present the results of
our implementation that produces adequate models and causal explanations of a variety of electromechanical
devices drawn from a library of 20 components and 150 model fragments.

G. Zlotkin and J.S. Rosenschein, Compromise in negotiation: exploiting worth
functions over states

protocols. One of the main assumptions there was that the agents' goals remain fixed—the agents cannot relax
their initial goals, which can be achieved only as a whole and cannot be partially achieved. A goal there was
considered a formula that is either satisfied or not satisfied by a given state.

We here present a more general approach to the negotiation problem in non-cooperative domains where
agents' goals are not expressed as formulas, but rather as worth functions. An agent associates a particular
value with each possible final state; this value reflects the degree of satisfaction the agent derives from being
in that state.

With this new definition of goal as worth function, an agreement may lead to a situation in which one
or both goals are only partially achieved (i.e., agents may not reach their most desired state). We present a
negotiation protocol that can be used in a general non-cooperative domain when worth functions are available.
This multi-plan deal type allows agents to compromise over their degree of satisfaction, and (in parallel)
to negotiate over the joint plan that will be implemented to reach the compromise final state. The ability to
compromise often results in a better deal, enabling agents to increase their overall utility.

Finally, we present more detailed examples of specific worth functions in various domains, and show how
they are used in the negotiation process.

R. Hirsch, Relation algebras of intervals

Given a representation of a relation algebra we construct relation algebras of pairs and of intervals. If the
representation happens to be complete, homogeneous and fully universal then the pair and interval algebras
can be constructed direct from the relation algebra. If, further, the original relation algebra is ω-categorical we
show that the interval algebra is too. The complexity of relation algebras is studied and it is shown that every
pair algebra with infinite representations is intractable. Applications include constructing an interval algebra
that combines metric and interval expressivity.

S. Kraus, An overview of incentive contracting

Agents may contract some of their tasks to other agents even when they do not share a common goal. An
agent may try to contract some of the tasks that it cannot perform by itself, or that may be performed more
efficiently by other agents. One self-motivated agent may convince another self-motivated agent to help it
with its task, by promises of rewards, even if the agents are not assumed to be benevolent. We propose
techniques that provide efficient ways for agents to make incentive contracts in varied situations: when agents
have full information about the environment and each other, or when agents do not know the exact state of the
world. We consider situations of repeated encounters, cases of asymmetric information, situations where the
agents lack information about each other, and cases where an agent subcontracts a task to a group of agents.
Situations in which there is competition among possible contractor agents or possible manager agents are also considered. In all situations we assume that the contractor can choose a level of effort when carrying out the task and we would like the contractor to carry out the task efficiently without the need of close observation by the manager.

H. Almuallim, An efficient algorithm for optimal pruning of decision trees

Pruning decision trees is a useful technique for improving the generalization performance in decision tree induction, and for trading accuracy for simplicity in other applications. In this paper, a new algorithm called OPT-2 for optimal pruning of decision trees is introduced. The algorithm is based on dynamic programming. In its most basic form, the time and space complexities of OPT-2 are both $\Theta(nc)$, where $n$ is the number of test nodes in the initial decision tree, and $C$ is the number of leaves in the target (pruned) decision tree. This is an improvement over the recently published OPT algorithm of Bohanec and Bratko (which is the only known algorithm for optimal decision tree pruning) especially in the case of heavy pruning and when the tests of the given decision tree have many outcomes. If so desired, the space required by OPT-2 can further be reduced by a factor of $r$ at the cost of increasing the execution time by a factor that is bounded above by $(r+1)/2$ (this is a considerable overestimate, however). From a practical point of view, OPT-2 enjoys considerable flexibility in various aspects, and is easy to implement.


S. Das and N. Ahuja, Active surface estimation: integrating coarse-to-fine image acquisition and estimation from multiple cues

R. Greiner, PALO: a probabilistic hill-climbing algorithm

G. Lakemeyer, Limited reasoning in first-order knowledge bases with full introspection

M. Goldszmidt and J. Pearl, Qualitative probabilities for default reasoning, belief revision, and causal modeling

P.T. Devanbu and D.J. Litman, Taxonomic plan reasoning

H.J. Berliner, $B^*$ probability based search

L. Steinberg and N. Langrana, EVEXED and MEET for mechanical design: testing structural decomposition and constraint propagation

A.K. Sen and A. Bagchi, Graph search methods for non-order-preserving evaluation functions: applications to job sequencing problems

R. Ben-Eliyahu and R. Dechter, Default reasoning using classical logic

R.E. Korf and D.M. Chickering, best-first minimax search