Current Tools for Assisting Intelligent Agents in Real-time Decision Making

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## Accessibility for Intelligent Agents

<table>
<thead>
<tr>
<th>Software</th>
<th>build model</th>
<th>load model</th>
<th>set value</th>
<th>type of interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ergo</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>C library</td>
</tr>
<tr>
<td>GeNIe/SMILE</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>C++ library</td>
</tr>
<tr>
<td>Hugin</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>C library</td>
</tr>
<tr>
<td>Netica</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>C library</td>
</tr>
<tr>
<td>Analytica</td>
<td></td>
<td>x</td>
<td>x</td>
<td>OLE</td>
</tr>
<tr>
<td>DATA</td>
<td></td>
<td>x</td>
<td>x</td>
<td>DDE, OLE</td>
</tr>
<tr>
<td>DPL</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>DDE</td>
</tr>
<tr>
<td>DecisionPro</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>DDE, TCP/IP</td>
</tr>
<tr>
<td>Delta</td>
<td>x</td>
<td></td>
<td>x</td>
<td>C library</td>
</tr>
<tr>
<td>Expert Choice</td>
<td></td>
<td></td>
<td></td>
<td>(GUI only)</td>
</tr>
<tr>
<td>Criterium DecisionPlus</td>
<td>x</td>
<td>x</td>
<td></td>
<td>OLE</td>
</tr>
</tbody>
</table>
What is a Pronouncer?

“It suggests an extrinsic entity, and also that the advice given is formal and authoritative, giving the entity a normative status.”

Boman & Verhagen 1998
Basic Functionality

- load template models

- set/modify values

- evaluate model, and answer with a single recommended alternative
Examples of Extended Functionality

- structural modifications of models
- sensitivity analyses
- probabilistic learning
Architecture of Implemented Pronouncers
Scenario 1: Agent cannot see ball

D: move or wait?

ball becomes visible

U

movement of ball

D: move or wait?

ball becomes visible

U
Scenario 2: Agent has ball

D: what to do with ball

ball

fellow–player

D: what to do with ball

opponent

ball

U
Performance on Solaris

![Graph showing performance comparison between Netica and SMILE on Solaris]

- Netica
- SMILE
Performance on Windows

![Graph showing performance comparison between Netica and ActiveDATA on Windows. The x-axis represents different scenarios labeled 'cantsee1', 'cantsee2', 'hasball1', and 'hasball2'. The y-axis represents milliseconds. Two lines are plotted: one for Netica represented by a solid line and one for ActiveDATA represented by a dashed line. The performance varies across different scenarios with Netica generally performing better than ActiveDATA.](image-url)
Future Research

- test pronouncers in RoboCup (and other real-time domains)
- pronouncers using supersoft decision analysis (Delta)
- pronouncers using AHP (Criterium DecisionPlus)
- implement extended functionality
- test other approaches (e.g. anytime algorithms)