

SBC++ 2003 - Team Description

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1 Introduction

Our main goal in this project is to accomplish multi-agent behaviors such as strategy setting and cooperative learning with insistence on Behavior Networks(BN). To achieve this, SBC++ uses Extended Behavior Network(EBN) model, designed by Dorer[1], as its fundamental base.

2 Team Development

SBC++ 2003, is mostly based on our first development for RoboCup 2000 competitions[2]; meanwhile we have done some major modifications both in the field of low level and high level code. Following comes a brief of what has been done:

2.1 Updating Low Level Code

Considering the changes of RoboCup Soccer Server, during previous years, we updated the team's low level code in several aspects, such as:

- Communication syntax
- Heterogeneous players, coach and substitution
- New soccer server commands

2.2 Updating High Level

As mentioned, our team uses EBN in its strategy level. Recent works in our EBN library supports for better continuation of the running skill. Besides modification in memory lets the agent to overcome some calculation duplications we had before, thus the agent does the necessary calculations once and uses the results in both perceptions and competition layer.

We are also writing an X-Window based interface to debug and trace the status of the behavior networks. The new implementation of EBN is in the form of a portable library and can be used by other teams and even other applications.

2.3 Trainer

We are trying to observe the results of EBNs in a reinforcement learning space. Obviously a trainer will be needed. CMUnited-99[3] Trainer modules are used as our development base.

3 EBN in MDP Space

Extended Behavior Networks are a reliable mathematical model for high level planning[2,4].

New approaches in RoboCup domain show that reinforcement learning can be used successfully in high level decisions of a multi-agent team like co-planning and positioning.

Considering both, we came to this conclusion that it might be possible to train EBNs in MDP or even Multi-agent MDP spaces.

Although a lot of work has to be done in this field before we reach a notable result, we plan to use at least several trained skill via RL over EBNs for RoboCup 2003.

References

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