

## **a<sup>4</sup>ty'2004 Team Short Description**

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The RoboCup Simulation League's is moving to 3D, a<sup>4</sup>ty team also decided to shift its research and development to the 3D since this gives a more realistic testbed environment.

### **a<sup>4</sup>ty'2004 2D**

Basically, a<sup>4</sup>ty'2004 is based on the a<sup>4</sup>ty'2003 [Vasilyev *et.al.*, 2003] high-level code with some minor modifications and UvA Trilearn'2003 low-level code [De Boer & Kok, 2002].

### **a<sup>4</sup>ty'2004 3D**

a<sup>4</sup>ty'2004 3D is based on agenttest (3D v0.2 server's example agent). The major modifications which have been done are:

- Increased shooting precision
- Braking low level command
- Objects states prediction
- Modified high level behavior

Due to the time constraints a<sup>4</sup>ty'2004 3D version is not completely ready at the moment. The features which are currently under development (will be implemented in the final version of a<sup>4</sup>ty'2004 3D) are:

- Localization
- Formation and strategic position
- Dribbling
- Pass
- Optimal use of batteries
- Hybrid agent behavior

### **Hybrid agent**

In a<sup>4</sup>ty team we proposed using of hybrid agents [Bensaid & Mathieu, 1997] for some kinds of situations, *e.g.* set plays. Hybrid agents combine planning and reactive

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behaviors for global goal achievement. The key feature of the hybrid agent proposed by a<sup>4</sup>ty is the ability to evaluate the probability of the sub goal achievement. The agent can stop using the plan if it sees that the plan can't be achievable. In order to do that the evaluation function is defined. Each agent has its own plan (could be defined explicitly). Time intervals are being used for sub goals synchronization between the agents.

### Literature

[Bensaid & Mathieu, 1997]

Bensaid, N., and Mathieu, P. A hybrid architecture for hierarchical agents, pp.91-95, University, Gold-Coast, Australia, 1997.

[De Boer & Kok, 2002],

Remco de Boer, and Jelle Kok, The Incremental Development of a Synthetic Multi-Agent System: The UvA Trilearn 2001 Robotic Soccer Simulation Team. Master's thesis, University of Amsterdam, 2002.

[Vasilyev *et.al.*, 2003]

Alexey Vasilyev, Andrei Kapishnikov, and Anatoly Sukov, a4ty'2003 Team Description, RoboCup'2003 CD-ROM, 2003.