Team WROCŁAW'2002

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So far, the team representing Wrocław University of Technology is the only team representing Poland in official Robocup simulation league competitions. Presently, team WROCŁAW'2002 comprises two lecturers (Marek Piasecki and Paweł Rogalinski) along with junior students of Electronics Department (Radosław Rudek, Paweł Trociński, Mariusz Tywoniuk, and others).

Robocup simulation league is an interesting example of multiagent system which facilitates testing and comparing various techniques of creating algorithms controlling agents operating in an environment having features similar to the "natural world". Trials have been undertaken at Institute of Engineering Cybernetics to create such algorithms through evolution. Our initial research constituted automatic optimisation of player control algorithm parameters using the conventional genetical algorithm.

In the second stage of testing, genetical programming algorithm was used for automation of reactive controller programming, enabling evolutionary creation of program structure represented in the form of instruction tree. Finally, to overcome difficulties with vast solution space and computational complexity, we introduce the technique of multi-level parametrical and structural evolution.

The crucial point of our architecture is parallel connection of several low level reaction modules and high level deliberative action planning. Actions elaborated by various modules are subsequently evaluated and arbitrated by superior Task Manager. Such architecture enable us to test and directly compare different control paradigms.

At this stage of development, both approaches (reactive and deliberative) are applied mainly in action planning for single player. Cooperative sequences and deliberative planning for small formations are still under construction

Encouraged by the interesting results of research works conducted, we took up the challenge of competing in world championships RoboCup 2002. Unfortunately, the team software, utilised for scientific experiments (e.g. genetical programming of player behaviour) turned out in practice to be too "weak" in confrontation with game level of current RoboCup top teams. Therefore, the software of team Wrocław'2002 notified for the games is a compromise between the results of scientific works and the clever tricks created ad hoc, so as to meet the relevant rules and maintain minimum game level.

We would like to thank the team CMUnited'99 for providing the source code of standard communication routines and basic world modelling for soccer player. It enables us to speed up initiation of our work.

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