Caspian Coach 2005 Team Description

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Abstract. In this paper we will introduce main ideas and corresponding approaches in coach simulation team. In *System architecture* we introduce our overall system design. In *Patten Extraction* offline phase issues is addressed and in *Pattern Detection* we describe how we overcome the challenge of detecting patterns in an opponent play log file.

1 Introduction

The Robocup Coach Competition mainly deals with [3]. This year, teams are given a set of log specific files. Teams should extract patterns in offline mode through comparative operations among the logs (Base strategy rcg and Pattern rcg files), and then in online mode they should detect the patterns. After its previous work in this field, Caspian coach simulation team has achieved some good ideas and strategies which are described in the rest of this document.

2 System Architecture

According to our previous experiments and the ideas mentioned above we have achieved a base design of the system as shown bellow:

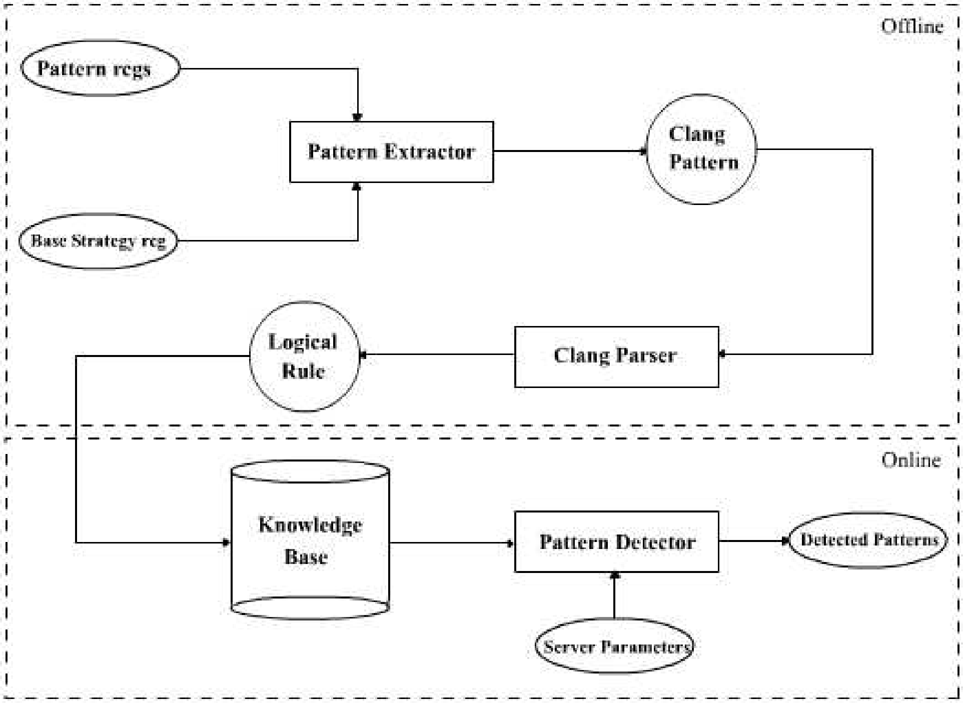

Fig. 1. Caspian coach system architecture

Base Strategy is a generic model of opponent behavior. *Pattern rcg* has minor differences in its underlying behavior with that in Base Strategy. Giving this rcg files, *Pattern* and *Base strategy rcg,* to the *Pattern Extractor* module, it will compare the input files and extract *Clang pattern*s during the offline phase (Clang is chosen as our intermediate language syntax). In *Clang Parser*, Clanged patterns are parsed to a distinct set of conditions and related actions, called *logical rules*; they are then fed to *Knowledge Base* to be used in online coach. In this phase *pattern detector* reports *Detected pattern*s according to information gathered from server and rules stored in knowledge base.

Pattern extraction and detection strategies will be examined in more details in following sections.

2 Pattern Extraction

A major challenge in offline coach is pattern extraction. We use two approaches to extract patterns:

a. Comparing raw log files and finding the differences, called patterns, and then converting them to an intermediate language.

b. Converting log files to the intermediate language, comparing them, and then extracting the patterns in the intermediate language format.

To support the idea of obtaining an intermediate representation format, we reverse-engineer log files as inputs and generate corresponding *Clang* rules.

We have used *Clang* as our Intermediate language because of its close relation to other parts of the system,

Our knowledge base is also filled with *Clang* records. Storing *Clang* (*Condition* and *action*) will ease the logical operations and business services done upon them in online coach subsystem.

3 Pattern Detection

In online coach the main challenge is detecting patterns according to parameters passed from server side and the extracted patterns stored in knowledge base. To overcome this problem efficiently, we use this scenario:

Each logical rule which is present in knowledge base will be weighted. The easier the rule condition is fired, the stronger the weight will be; then a *max-heap* is made to store the weighted rules. We detect the top element and reconstruct the heap during the online mode.

4 Future Work

As previous years of Robocup competitions, Caspian participates in most simulation leagues. Caspian Coach and 3D Simulation teams were working separately. As a future work we are going to integrate these two modules as a complete *RoboClub*. In this club, any primitive agent may enter and after some transactions, will be trained and upgraded in the *coach + 3D system*. Expert agents will be prepared through passing a set of generic training systems.

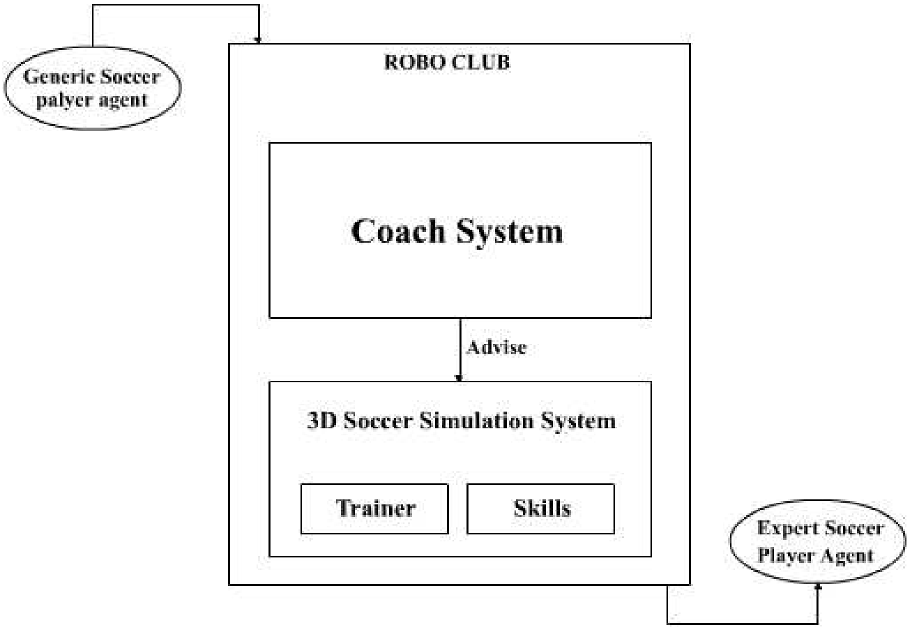
Generic Soccer palyer agent
ROBO CLUB
Coach System
Advise
3D Soccer Simulation System
Trainer
Skills
Expert Soccer Player Agent

Fig. 2. RoboClub

References

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