ToosRes RoboCup Rescue Team Description

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Abstract. Rescue Simulation League which is joined with Robocup competition since 2001 aims to simulate a disaster space and intelligent agents such as Ambulance teams , Police forces , Fire brigades and their respective centers that act in that environment to decrease the injuries and damages in such an environment. Toosres Team that was formed in 2002, intends to implement the results of its research in different areas of AI, for example planning, learning and fuzzy reasoning in nondeterministic complicated environments similar to disastered environments

1. Introduction

Toosres Team that was formed in 2002. The founders are: Kayvan Yousefi-Mojir and Reza Zamanipour, two senior computers engineering students in the Computer Department of Ferdowsi University of Mashad. We looked for a test bed that has been tested to be useful in developing Multi-agent programs, during last year. We then chose the Rescue simulation project because it had attractive properties and it was very easy to develop systems with.
Toosres has motivated many students of the department of computer engineering, Ferdowsi University of Mashad, to work on MAS projects. Although Toosres couldn't participate in 2002 Robocup Rescue competition, it owes its persistence to support and endeavors of the team manager Dr.Mahmood Naghibzadeh. Besides its two primary members , some other undergraduate student declare their intention to join our team.

2. Structure

The structure of Toosres system is presented in Fig1. The basic communication facilities of the Rescue simulation kernel and our agents is conducted by a series of API units which was prepared by YabAI team [1]. These API's made an appropriate framework for developing rescue agents. Since each agent in MAS system should have some degree of rationality based on its internal knowledge, Toosres tried to make improvement in rational operation of each type of agents, separately.

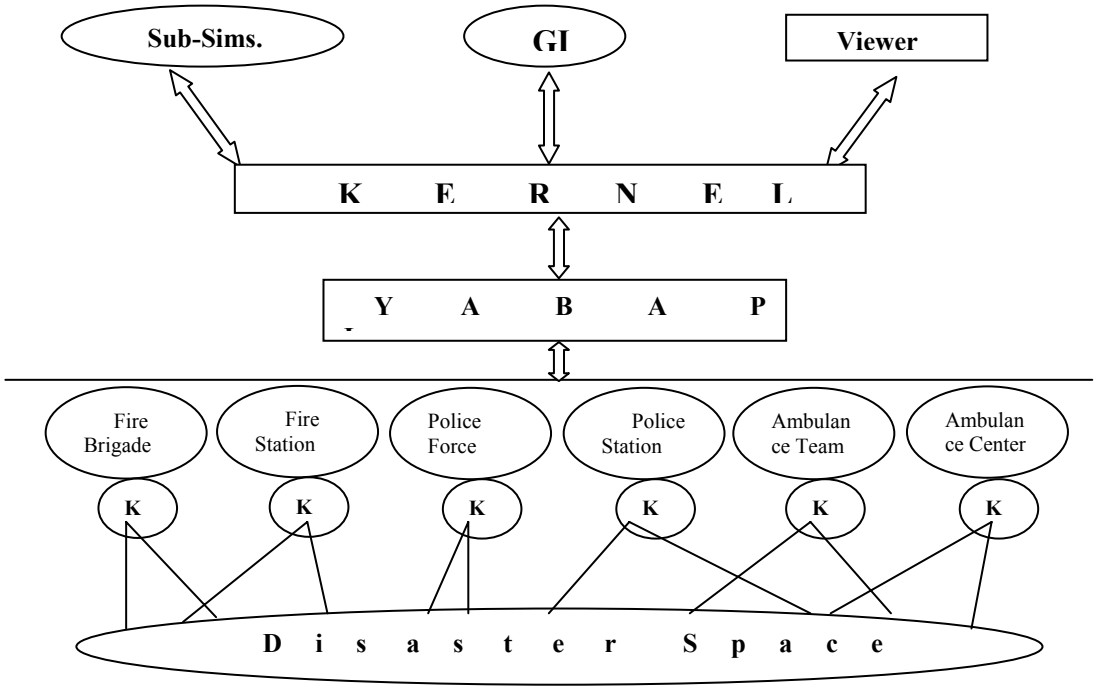

Fig. 1 block diagram of Toosres rescue simulation system

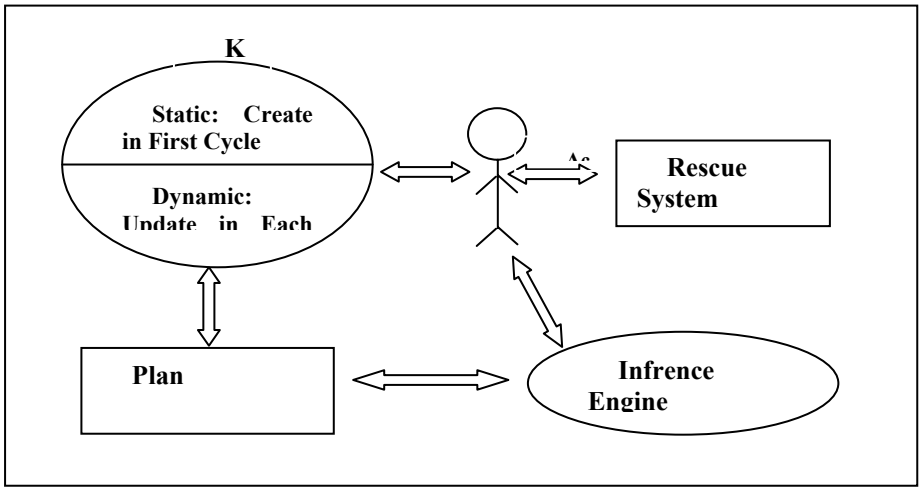

Fig. 2. The decision model of agents in Toosres system

3. Concepts and methods

In the design of this system, we assume that each type of agent has a special view of world around it. This special view of the world is different for each agent. The total world, in our system is divided into many grids. Each agent, based on its internal

model, assigns different priority to each grid. The priority assignment method utilizes various techniques and algorithms. Toosres investigated different methods to optimize the priority assignment algorithm, within each agent.

One of the most important characteristics of MAS is the interaction between components (agents). Because of very limited communication on the Robocup Rescue system, the invention of efficient methods for communication is very important and necessary. Due to high efficiency, performance and simplicity, Arian Communication system[2] for sending and receiving messages is selected by Toosres. However, Toosres is currently engaged in designing and utilizing other communication system to better mach the internal structure of rescue agents.

Development and utilization of a protocol for communications that fulfills present and future needs of our system is another task we will work on in the following weeks. Toosres hopes to bring his new ideas into practice in the near future

References

[1] Takeshi Morimoto, How to Develop a RoboCupRescue Agent, http://robomec.cs.kobe-u.ac.jp/robocup-rescue

[2] jafar Habibi, Mazda Ahmadi, Ali Nouri, Maysam Sayadian and MaysamMohammadi, "Utilizing Different Multi-agent Methods in Robocup Rescue Simulation", http://ce.sharif.edu/robocup/arian