Development of an asynchronous network game using the classifier system

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In recent years, many people are enjoying games at home. Tens of game software for Playstations are shipped per week. They will be purchased and played, if a user want a game software. Many of these games are unilaterally supplied with the form of ROM, and they are "consumed". To be "consumed" is a situation in which the game is not played repeatedly once the ending is reached. I think that there are two causes by which the game is consumed. The first point is that a game is not interesting. The second point is that bugs cannot be corrected for the supply form of ROM. If these two points are solved, the game will become interesting and will not be bored. Therefore, the game will be not "consumed".

The purpose of this research are as follows:

(i) I analyze the elements which make games interesting, and create a game containing the elements. Then, I investigate whether the game become interesting.

(ii) By supplying the game on the internet, I correspond to requests of a player and fix bugs.

In this research, first, I investigated about the fun of a game and proposed eight elements which constitute the fun. The purpose of this research is to create a game which includes five elements considered to be the essential among the elements. The five elements are as follows:

- The concept of competition
- Game balance (difficulty suitable when enjoying a game)

- Novelty
- Communication
- Unexpectedness

The contents of the game on the internet are as follows. A player creates a virtual robot made it fight with other robots, and compete with other players with resulted ranking. A player cannot operate robot directly, during a battle, while the robots choose action, and learn battle patterns. A player decides the robot's initial cofiguration and the evaluation value of action.

To make the user interface more friendly, and make more people enjoy for a long time, following seven features are implemented.

(1) Use of the internet

By connecting to the internet, a player can play a game with somebody regardless of actual distance. A network software does not need to be shipped, and a small number of people can dvelop or distribute it.

(2) Asynchronous system

The battle is executed asynchronously so that people who have slow data transmission speed to the internet can also enjoy themselves. This asynchronous battle means that connection speed to the network of a certain player does not affect advantage of the game.

(3) Server-client system

In order to realize an asynchronous system, the server-client system was adopted for implementation. When the program on a server side is revised, a player can surely use improved system immediately.

(4) Game program using classifier system

Generally speaking peolpe who play a game many time can fairly predict reactions of the system to his operation. That's why a robot in oun game is made to learn an action pattern in a battle program using the classifier system which uses genetic algorithm. Setting up the robot by players makes the reactions more complicated. Consequently, it is thought that unexpectedness is obtained.

It is desirable that the number of choices done by a player is suitable. And the number of robot types was designed so that the strongest robot cannot continue to win. In the game, whether a player wins or looses depends on the selection of a player each time.

Since there is no other game in which an action pattern is changed dynamically during a battle, we think the novelty is attained.

(5) Ranking system.

The result of a battle is reflected in ranking and a game becomes white-hot further. By a multiplier effect of the ranking system and the classifier system, the concept of competition is realized.

(6) Use of a internet browser

Since installation of this kind of network game is difficult for a personal computer novice, it will be convenient that we can enjoy the game only by an internet browser.

(7) Bulletin board system

By the bulletin board system, information exchange and communication with other players are possible. We don't need to care about the difference of speed to type or other's convenience.

Finally, to investigate an effect of the learning by the classifier system, simulation experiments were conducted on some conditions. It turns out the robots which learn are stronger than the robot which does not learn, which suggests that the learning of a robot was effective. It was ascertained that there was no setup in which one robot always beats any other robots. Thus a good game balance has been realized. The time for one play, or the difficulty of an adventure is the valuation basis of the game balance when we enjoy a game.

An asynchronous system and a server-client system make a game play amusing, and the concept of competition and game balance, novelty, communication, and unexpected nature make a game interesting.