Knowledge sharing between robots

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Introduction

Knowledge sharing between robots has been investigated in this research. Each robot learns how to do a task by the use of Fuzzy Q-learning technique. While the robots learn the task, they share their knowledge with each others. Various sharing techniques are studied. A measuring of robot's expertise has also been proposed. The expertness measuring has been used to improve previous knowledge sharing techniques.

Problems

There are many problems found in robot learning. These problems are learning time constraint, generalization in continuous state and action space, uncertainty and nonlinearity in sensing and actuating.

Methodology

Fuzzy Q-learning is a promising technique to handle the above problems. Multi robots are served for learning a task with a limited time. While the robots are learning, they share their knowledge.

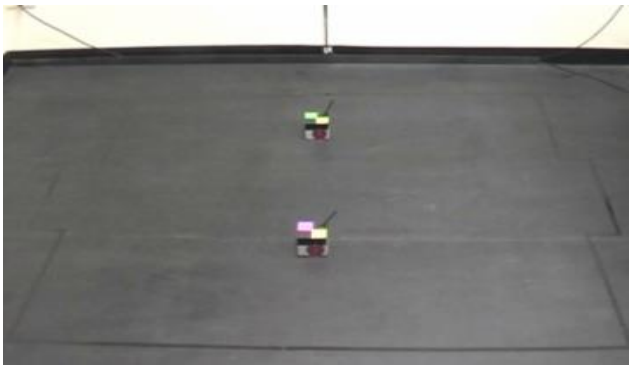

Figure 1 Knowledge sharing between robots in which the robots learn to move to the goal.

Expected Results

After the robots share knowledge in a team, learning's speed and performances should be increased. Moreover, the robots should be able to learn a complicated task in a limited time.

Research Funding

The Royal Golden Jubilee Ph.D. Program, The Thailand Research Fund.

Reference

[1] P. Ritthipravat, T.Maneewarn, D. Laowattana, and J. Wyatt, "A Modified Approach to Fuzzy Q Learning for Mobile Robots", In the proceeding of the 2004 IEEE International Conference on Systems, Man and Cybernetics (IEEE SMC'04), The Hague, The Netherlands, Oct. 10-13, 2004