

Learning by Imitation for Mobile Robots Applications Mr. Sathit Wanitchaikit, Dr.Poj Tangamchit, and Dr.Thavida Maneewarn

Introduction

In human, useful information for communication including teaching and learning are embedded within action or task demonstration. Showing how to do is usually better than only telling. By embedded imitation ability into robots, it can learn and inherit skill from human or the other robot efficiently. So, this comes into paradigm of leaning by imitation approach.

Objective

Find how to extract skill for performing a task from human into robot by using visualize information.

Methodology

To imitate behavior from teacher, the ability of behavior representation is necessary basis for robots [1][2]. In this work, behavior or decision policy is defined in the form of state-action pair. The set pair showed any action which teacher do when confront to any state. We defined this as intermediate behavior imitation.

Self organizing map neural network is used to perform mapping process of intermediate behavior imitation. The task demonstration is presented to the network to cluster the state-action pair and construct the decision map as shown in figure1. Then, robots can perform the learned behavior in teacher manner by using this map to guide which action to perform in confront state.



Fig1: Intermediate behavior mapping.

Expected Work

Develop the algorithm for performing intermediate behavior imitation.

References

- [1] P. Bakker and Y. Kuniyoshi, "Robot see, robot do: An overview of robot imitation," in Proceedings of the AISB96 Workshop on Learning in Robots and Animals, 1996, pp. 3-11
- [2] S. Schaal, A. Ijspeert, and A. Billard, "Computational approaches to motor learning by Imitation", Philosophical Transactions of the Royal Society of London, Serires B, Biological sciences. Mar 29, 2003, pp 537-547



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