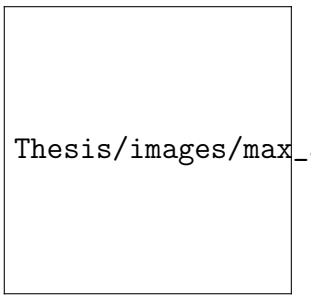

Humanoid robot learns walking by human demonstration

Master Thesis

Submitted in Fulfilment of the
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Dept. of Computer Science
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Submitted by: Juncheng Hu
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Abstract

In this paper, a method designed for making the humanoid robot walking is developed by using the DQN in reinforcement learning. Machine learning has demonstrated a promising feature in many fields including robotics. However the supervised learning algorithms are more often applied. But supervised learning like nerual networks always need a huge amount of data to train, which is sometimes not permitted in real situation. Although not much data is required in reinforecement learning, it need many attemps in its environment thus concluding a strategy. For a humanoid robot, it is not allowd to have to much bad attemps because a fell down may leads to the injury of a joints. In this paper an method that the robot learns walking with the help of human can avoid unnecessary fellings is proposed.

Keywords: humanoid robot, reinforcement learning, robot walking

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List of Abbreviations

KDE K Desktop Environment

SQL Structured Query Language

Bash Bourne-again shell

JDK Java Development Kit

VM Virtuelle Maschine

IC Inter-Integrated Circuit

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IC Inter-Integrated Circuit

1 Introduction

1.1 Robot

1.2 NAO

1.3 CPG

2 State of art

2.1

3 Implementation

3.1 Implementation Swing on Nao by Q-learning

As it is mentioned in previous chapter, the Q-learning method could be used to realize many control problems. In this section, the Q-learning algorithm is used to control the 2 alpha values based on CPG algorithm

4 Referencing

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