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Dipartimento di ingegneria dell'informazione e scienze

matematiche

Computer and Automation Engineering

Robotics and Automation

Handshake human-robot analysis

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Contents

Introduction

The following work wants to explore the phases of the handshake between a human and a robot, reaching a consensus in the human-machine interaction. The handshake event can be divided in two steps: the approaching and handshaking. The consensus is a parameter that allow the human to evaluate a handshake mixing aspects like: duration of the event, dynamics, force exchanged etc.. The handshake is the most common human-human interaction and is extensively used worldwide in events like: greetings, introduction routine between human beings and agreements. This work focuses only on the latter handshake step, with the purpose of evaluating different algorithms. Many research teams focused on the the human-robot physical interaction, providing different solutions.

Chapter 1

The state of the Art

Develop a robot capable of performing a smooth human-like handshake is still a highly interested topic in the scientific literature. The industries are highly interested in robots since they can easily implement repetitive tasks and improve the business reducing failures in final products. [3] [1] [4] The robots are becoming more and more common in our daily lives, [2].

1.1

1.2

1.3

Chapter 2

The Idea

Chapter 3

Hardware setup

3.1 The Pisa/IIT qbhand

3.2 The Sensors

3.3

3.4 Ros

Conclusion

This project applies learning [**?**] techniques to MNIST handwritten dataset. As we can see in the previous confusion matrix the accuracy of the final work is 97.6%. The overall idea is to train *autoenc1*, *autoenc2* and *softmax1* once per time and to crop the nets in order to have coherents dimension between network interconnections. At the end of [**?**]this process we stack all the partial neural network together and the deep neural network come to life.

The satisfaction behind this project can be experimented by running the file "MNIST_drawsim.m" which is a matlab function that allows the user to draw a digit and returns the correct digit value 97,6 times over 100.

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