INF3490 Mandatory Assignment 2: Multilayer Perceptron

Paul Wieland

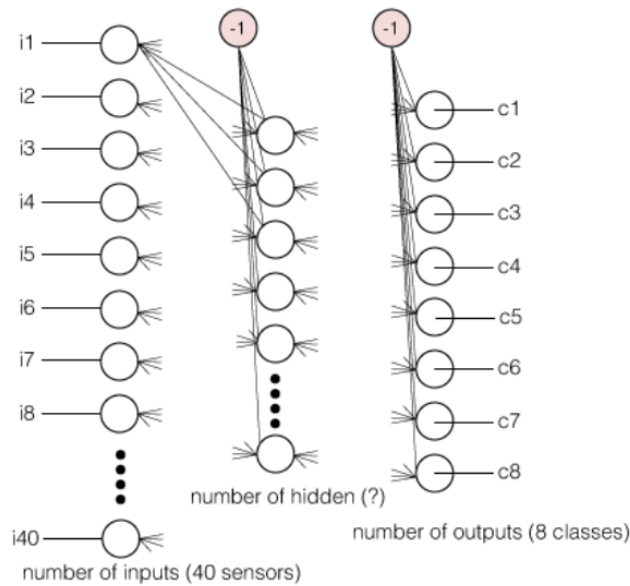Deadline: Tuesday, October 16th, 2018 23:59:00

Contents

1 Introduction

1.1 Task

We will build a Multilayer Perceptron to steer a robotic prosthetic hand. There are 40 inputs of electromyographic signals that we will classify.

There are 8 classification values corresponding to a different hand motion:

Possible motions [1]

Multilayer Perceptron for our problem [2]

We build a Multilayer Perceptron with 40 entry nodes, that means one node for each input. Then there is one hidden layer with a various number of hidden nodes. For classifying the input, there are 8 output nodes corresponding to the 8 hand motions. We only use one hidden layer to solve this problem.

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[1] http://folk.uio.no/kyrrehg/pf/papers/glette-ahs08.pdf

[2] https://www.uio.no/studier/emner/matnat/ifi/INF3490/h18/assignments/assignment-2/assignment_2.pdf

1.2 Training Data

For each input vector:

$$input = [i_1, i_2, i_3, i_4, ..., i_{40}], i_n \in \mathbb{R}, n \in [40]$$

we have a target output vector:

$$output = [c_1, c_2, c_3, c_4, ..., c_8], c_n \in \{0, 1\}, n \in [8], \sum_{n=1}^{8} c_n = 1$$

That means, forwarding the input should result in the given target vector.