

Something about Robots and Emotions

Tore Haglund

Day Month Year

Abstract

This is where I will write something *engaging* and possibly even funny.

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1 Background

This Bachelor's thesis is to a large extent based on a previous Msc Thesis written by Vidullan Surendran. What I hope to add in this work is to try out the model in a more neurally plausible framework, i.e. using Nengo, a neural modelling tool for cognitive modelling.

1.1 Emotions in Robots

Hudlicka

1.2 Reward Prediction Error?

1.3 Nengo

Eliasmith,

1.3.1 Neural Engineering Framework

Charles H. Anderson 2003

John miller suggests is a "neural compiler" (Eliasmith, p. 41)

Core principles of NEF (Eliasmith, p. 42):

1. Neural representations are defined by the combinations of nonlinear encoding (exemplified by neuron tuning curves and neural spiking) and weighted linear decoding (over populations of neurons and over time).
2. Transformations of neural representations are functions of the variables represented by neural populations. Transformations are determined using an alternately weighted linear decoding.
3. Neural dynamics are characterized by considering neural representations as state variables of dynamic systems. Thus, the dynamics of neurobiological systems can be analyzed using control or dynamics systems theory.

2 Research Question

Can I recreate Surendran's results?

3 Method?

I am going to model a small autonomous robot with the neuron-based computation models of Nengo.

3.1 Simulation

The robot and its environment is simulated using Python and especially the package `graphics.py` created by (THE PERSON). The simulation contains:

- A blue circle representing the Robot
- Green circles representing Food
- Red circles representing Threats
- Purple circles representing Safe Zones
- Walls

Interacting with the objects in the environment generates events, that affect the emotional state of the robot.

3.2 Emotion Model

3.2.1 Prediction Error

Is this even going to be implemented with Nengo? Possibly.

3.3 Nengo

How will the computation be implemented with Nengo? Some neural clusters and connections between them. I will have to ask Terry about that.

4 Resultat

Mm, hur kommer det att gå egentligen?

5 Diskussion

6 Källor

Frågor:

- Vad ska jag skriva i Bakgrund?
- Vad ska jag skriva i Metod?
- Frågeställning, ”Can I recreate Surendran’s result?”
- Hur kan mitt resultat se ut? Ska själva Nengo-modellen också räknas som resultat?
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