Robotic Self-awareness

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Abstract

This paper presents the first self-awareness experiment for a robot. The robot got to know it self before deal with the environemnt.

1 Introduction

- Small story behined this paper

With current advances in the robotics multisensory platforms, it is time to utilise these capabilities and construct a robot that able to dynamically interact with humans and other robotic agents.

Our approach to start with implementing the priminalary part of self-awareness which is mostly missing by others. The agent try to interact with itself to construct a self recognition before interacting and deal with the environment objects. the sense of self is constructed from comprehend both spatial and internal sensory.

1.1 What is self-Awareness

- self-awareness difinition in human.
- why it is important in the human (one sentance).
- self-aware the robot fesaibility, if applicable.
  Question: Why it is important to know your self before doing the task? Most or all current tasks are done without referal or preior recognition.
- emphsis the in-to-out approch (one sentence).

1.2 Absence of self-awareness and the problems associated with a robot lack of self-awareness

- current robot status and how robots works in some different environments.
- some problems because of robot is not aware.

A basic hand out task is happining between two parties, one is the robot itself and a second robot's hand. If the robot not able to know which of two hands are belong to itself, the task can not be established autonomusly. The trajectory calculation might not be corresponds to the corrct path, from its hand to the target.

- possible applications.

The robot can infer its body as a distinct entity within other world's entities which give more potential to avoid obstacles and source of collisions.

- list paragraphs to indicates the paper structure.

2 Literature review

2.1 levels of self-awareness

- Human five levels of self-awareness

2.2 Related literature on self-awareness

- current efforts to create the robot self-awareness.
- other methods and approches to create the Robot self-aware.
- our method and approch to create the robot self-awareness.
- why we see our approch is better and unique (from in-to-out).

3 The Self-Aware Architecture

3.1 Design and Rationale

- design to devise SA in robot.
- utilise the sensories in relation with from in-to-out rationale.
- the design of DNN model (selfy model).
- maybe other rationals behind the design.

3.2 Materials and Methods

- required data and the explination of that data.
- data collection and the data description.
- maybe how data collected.

3.3 Implementation of Level 1

- process description for DNN model with collected data.

4 Experiment

4.1 Evaluation cases

- descripe the cases.
- results achived.

4.2 Discussion

4.2.1 How to move forward to Level 2

knowing the self-body is achived in this expirement and that constructed the initial sense of self in the baxter robot, but the body atriculation and exact situation is not figured out yet by baxter, thus develping situation stage wich represent level 2 of self-awareness is the next step to let robot able to control its self in the environment.

5 Conclusions and Future Work

Work on next level of self-awareness.