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SOME PRACTICAL INTRODUCTIVE THEORY FOR A GENETIVE HUMANOID ROBOT

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Abstract. *A robot is to everybody's mind a mechanical man. In robots we have a set of abilities which in reality are complex given mostly by SW. A developmental progression of social skills and the embodied theory of mind in SW in enormous task, where developed in some extent to give high-level cognitive skills to low-level perceptual abilities appointed to a humanoid robot. Structural methodological problems in theory of mind of the robot employing high technological components such as genetive (DNA) produce the Genetive Humanoid Robot (GHR), which we are ideal with. Further on we work on ideas that give the opportunity to avoid or recover from big mistakes. The idea that the GHR has to be shaped like human gives the best development. The best of all animal behavior. This also gives to work for observations and feelings.*

1. Introduction

Some fundamental theory of mind and other aspects are discussed by some scientists, based upon a modern awareness of cognitive science, neuroscience, psychophysics, physiology, bioengineering, psychology et.al. The theory of mind is discussed in depth by Scasselati (2001), and is the attempt to represent the hidden state maintained by another agent based upon the observable behavior of that agent. Some other theoretical aspects for robots are discussed by Eck (1995). We have to remember that a number of researchers from many fields try to delineate the theory of essential robot behavior and structural fundamentals by Voukalis Helen et. al. (2004) and Voukalis D. (2004). All these foundational skills have been studied in many disciplines to delineate and give hopes to approach understanding to construct a real advanced integrated robot with high tech systems that approach the human being behavior, metaphor and anhtropomorphology.
And this because:
Shape and structure of GHR has to look like a human and this is that the human mankind was tested through the centuries for the environment and that is the best creative creature of the biological beings, thus has the best cognitive modelling.

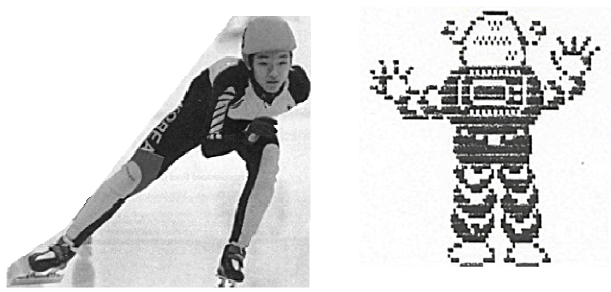

Figure 1. Human and today's robot.

Has to be a teaching machine that has a capable mind and then the shape is not independent of human mind. And this because human is the only universally accepted paradigm of intelligence and the best physical being to think

So the building of systems has to be like human.
Thus we have to use especially :
Construction with DNA components.
Biological Engineering concepts.
Animation behavior (Simulation of human mechanical systems).
To use the human body as a complex physical datum system of several or if all its degrees of freedom.

To make the environment safe for all the involving parts, people and objects. We have to take care for the environment to be full monolithic or modified.

To employ no monolithic GHR control. Especially methods of recognizing errors and successes.

To emply no monolithic sensors, motors and equipment and to compare all of them together in the best way. Employ also observations and feelings. Further the most important feature has to be mimic and imitation procedures of high level.

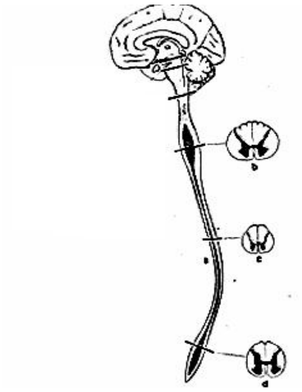

Figure 2. Human mind and neural spinal column in primitive status.

2. Structural aspects

In this part we try to implement in the best way the human body (physical datum) system with mechanical systems. We represent the main 206 bones of skeleton as :

Torso (5), each arm (32), each foot (31), the spinal column (2), thorax (25), cranium or skull (29) bones. These are mounted as five degrees of freedom (shown in Figure 3), for each arm (2x5) and five for each foot (2x5), region 2, 4, 5 and 6. Also for verterbral column 25-26, cranium 2 ,eye 3, torso 3 and neck 3. This makes a total 36-37 degrees of freedom for regions 1-3. Thus for the moving parts of the human corp we have 1-6 regions and we have approximately $\{10+10+2+3+3+3+(25\div 26)\}=56\div 57$ degrees of freedom for the moving parts of human body.

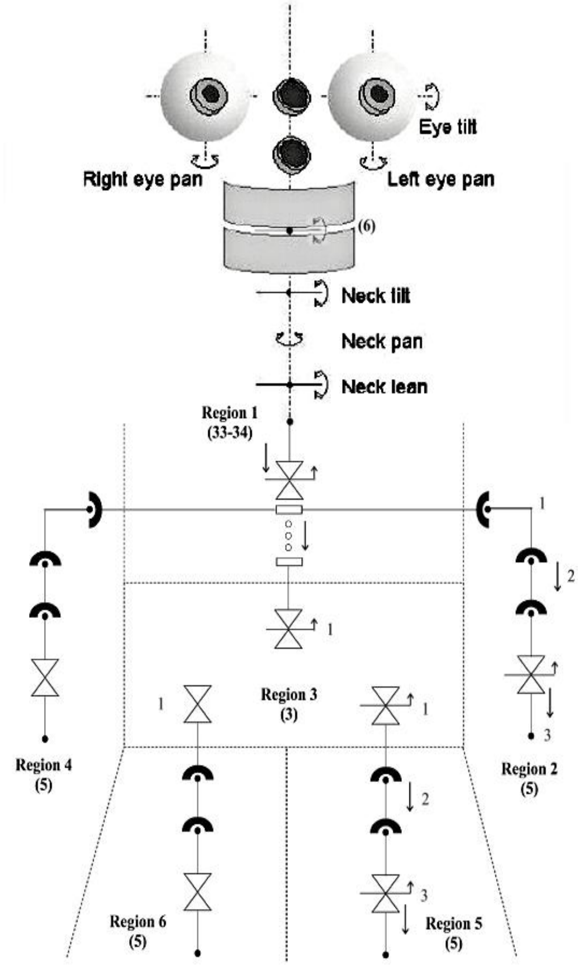

Figure 3. Human body (physical datum) system and its mechanical degrees of freedom.

3. Bulding of the GHR

To build systems to approach natural human anthropomorphological systems and biological models of social development of behavioral systems for a GHR we have to use in extent :

Advanced computational sciences.

Parallel multilevel partition sensors.

Methods on data sensors, especially DNA structures.

Modelling and simulating of genetive robot (GHR).

Artificial brain research.

Artificial social life.

Artificial mind research.

- Fuzzy control.
- Genetive algorithms (for GHR).

- Genetive computations and technology.
- Virtual reality.
- Novel approaches in genetive (DNA) GHR for body and soul.

In reality a real robot (GHR) can be built from the most simple but worthy components to the most advanced of high technology ones. So an ingredient system can be the real model of a modern robot. Thus no full monolithic internal model exists since now at robots.

Nowadays high technology helps to implement and attempt to evaluate biological models using mechanical systems. Fields as social sciences, nanotechnology, reactors, SW, sensors et. al. have to be evolved to respond to changes to be well understood and used for the GHR structures.

We need to have some characteristics to structure the GHR systems such as :

- Development of the theory and work on ideas and real designs in HW and SW to genetive HR.
- Building efficient real time systems of social interaction.
- We have to use real physical coupling to environment and we have to be attentive in many ways with the implemented system of GHR to be working properly.
- In order to guide the GHR to work for a goal the robot has thoroughly be integrated by all the systems to be working as multiple internal sensory of logical representation system and interfaced to the external world et. al.

4. Kinesthetic moving – Sensoring systems

We require to involve a variety of coupled human-like sensors systems for the human-like kinesthetic systems of GHR. These have to be strictly necessary and produce critical tasks for the investigation of the GHR social interaction such as:

Eye - Vision
Tongue - Taste
Skin - Touch
Nose - Smell
Ear - Hearing
Auditoring }

The GHR has to decide who, what, how and when to imitate and these actions have to take place at ground center of wisdom-acquirements. For all these GHR requires to observe, imitate and respond or manifest by:

Action, speech, vision on screen, writing, talking-walking, thinking, learn, imitate, decide compare, percept, evoke, make action, store knowledge.

5. Making sensoral activities system for GHR

Since today we have no monolithic sensors appointed to behavioral interactions and activities to robot systems. The basis or the ground center of wisdom acquirements of the robots may be that they have similar morphology but then differ in construction according to research involved in SW and the architecture designed to allow the robot to sequence its actions.

In Figure 4 we have designed an architecture environment for the GHR. This can be employed in SW and can be categorised to match all known behaviors and actions of the GHR.

Finally a variety of research programs can be made to teach the GHR to perform single or more correctly parallel tasks using observations or self-teachings or introspective actions to match thorough the human and the environmental status of the GHR.

This can be made not only for shape radical cases but also in extent to robust or hazard advanced cases, maybe have to be implemented gradually in time.

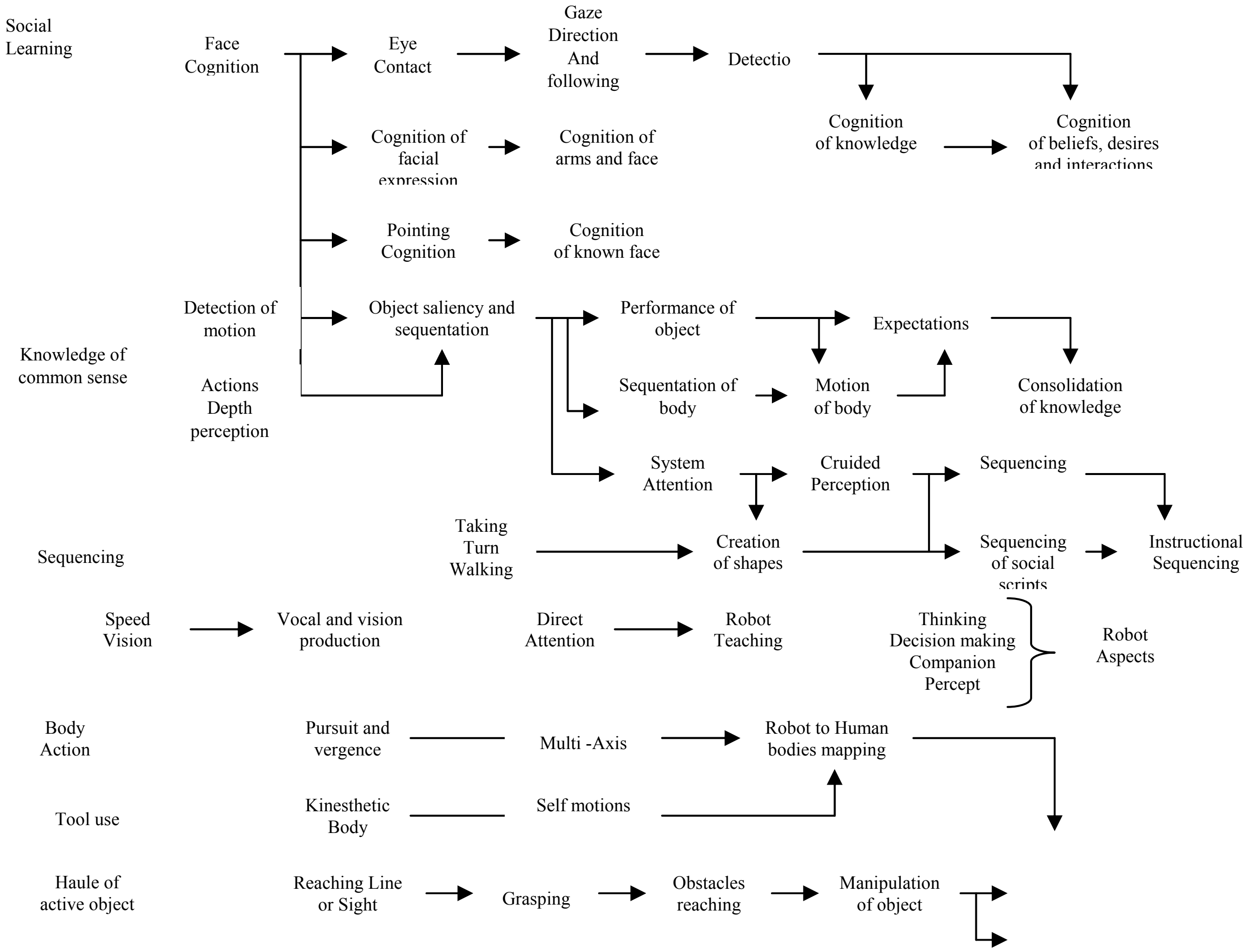

Figure 4. Designing of some behavioral interactions for GHR.

Conclusions

A GHR is defined in this paper. The HW + SW building systems are discussed for this robot.
A thorough understanding and the assumptions of the GHR for its computational metaphor are examined and worked. Especially the metaphor of human-like sensory and movements as the mechanical of the real human body in the actual degrees of freedom are examined.
These can be implemented in mechanical systems or other in strength materials or by SW.
Also, finally the anthropomorphic appearance case for the GHR is discussed, which gives modified and expressive capabilities for this robot to be one not monolithic but modern robot.

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