Chapter 8
Qualia Learning?
Innerbodiment Construction and Machine Self–Learning by (Emotional) Imitation

J. Vallverdú
Universitat Autònoma de Barcelona, Spain

ABSTRACT
Humans perform acts and imitate other humans’ actions by innate mechanisms that imply the unconscious notion of innerbodiment. In this chapter, the author suggests a mechanistic method to capture, discretize and understand human actions, following a semi-supervised WOZ system that could allow robotic learning by imitation or even self-learning. A syntax and semantics basic model of human actions guide is provided as well as a philosophical analysis of the notion of action.

1. PROGRAMMING QUALIA?
1.1. Defining Qualia
One of the most elusive and complex concepts in cognitive sciences is that of ‘qualia’. The MITECS define them as:

The terms quale and qualia (pl.) are most commonly used to characterize the qualitative, experiential, or felt properties of mental states. Some philosophers take qualia to be essential features of all conscious mental states; others only of SENSATIONS and perceptions. In either case, qualia provide a particularly vexing example of the MIND-BODY PROBLEM, because it has been argued that their existence is incompatible with a physicalistic theory of the mind.

By ‘qualia’ we mean those qualities that are accessible to you introspectively and that together make up the phenomenal character of the experience. In a simple way to explain it: our feelings about things. As you can see, the qualia has to do with internal and non-verifiable state and for these reasons you could conclude that there is nothing to be understood, nor useful. But there is one case, proprioception, in which qualia shows us a way to understand brain subsumption architectures in order to improve to our HRI models. Other qualia experiences, like empathy have shown to have a neural correlate and can be located into human
brains (Keysers and Gazzola, 2010). Therefore, perhaps there is a realm of dark and occult intern experiences but at the same time *qualia* must be neural processes and consequently, we should be able at least to figure out their functional and evolutionary meaning. It has also been said that proprioception is the sixth sense: taste, smell, touch, sound, hearing, sight...and *proprioception* (Abbott, 2006; Smetacek and Mechsner, 2004).

After this brief introduction to the nature of *qualia*, we could ask ourselves if do exist different kinds of them, something that becomes *a priori* a nonsensical debate. The reasons are easy to understand: *if qualia* are internal and private states, then their classification cannot be objective (except in the case of latest fMRI studies on objective pain measurement, a truly debatable topic; see Brown et al 2011). Perhaps we could talk about internal or external inducers of the emergence of *qualia*, as our own thoughts or other people interaction, just as an example of internal and external inputs. They could also be naively classified by the source of the information (sound, touch,...) but we must to remember that the cognitive processes are multidimensional, and that they are the result of an evaluation processing. After all these explanations, we conclude that *qualia* exist, but that we cannot map them clearly. Four practical purposes, we’ll talk only about the feeling of having a body that obeys us. A limit example, the dicephalus twins (as a specific type of conjoined or Siamese twins): Abigail and Brittany Hensel, now 21, have two spines, which join at the pelvis, two hearts and stomachs, three kidneys, two gall bladders and four lungs. Below the waist all organs including intestines, bladder and reproductive organs are shared. Each twin controls her half of their body, operating one of the arms and one of the legs. This means that as infants, the initial learning of physical processes that required bodily coordination, such as clapping, crawling, and walking required the cooperation of both children. While each is able to eat and write separately and simultaneously, activities such as running and swimming must be coordinated and alternate symmetrically. Other activities as diverse as brushing hair and driving a car require that each twin perform a sequence of quite separate actions that coordinate with the other. As a curiosity: Hensel twins both successfully passed their drivers license exams, both the written and driving tests. They had to take the tests twice, once for each twin. Abby controls the pedals, radio, heat, defogger, and other devices located to the right of the driver’s seat, while Brittany controls the turn signal and lights; together, they control the steering wheel. This example shows us several things about mind, body and proprioception, basically the intertwined nature of:

1. **Body coordination.**
2. **Plasticity:** Human mind is open to embrace more parts or to share actions.
3. **Propioceptive Skills Enables Shared Tasks (Very Useful for Human-Robot Interaction):** Allows the creation of a common working map to be solved with several bodies or parts of the body working together.

### 1.2. Inside Qualia: Proprioception

So, we must go back to proprioception, the true cause of our main interest about *qualia*. It belongs to human somatosensitive skills (touch, kinesthesis) and “is the sense of the relative position of neighbouring parts of the body and strength of effort being employed in movement”\(^5\). It is the sense of position and posture, movement and velocity of the body and body parts. This involves the location of our body or body parts in space, the relation of our body parts to one another, and the extent to, and pace at, which they change their position. In a nutshell: the (un)conscious feeling of being. Let me explain with a simple example: quoted from the neuroscientist Oliver Sacks (1985), “The Disembodied Lady”: this woman, after a viral infection of her spinal cord, lost her connexion with the body. She defined herself as
Related Content

Security and Verification of Server Data Using Frequent Itemset Mining in Ecommerce

Epistemology and Emotions
[www.irma-international.org/article/epistemology-emotions/77657](www.irma-international.org/article/epistemology-emotions/77657)

Nanorobot-Based Handling and Transfer of Individual Silicon Nanowires
[www.irma-international.org/article/nanorobot-based-handling-transfer-individual/68862](www.irma-international.org/article/nanorobot-based-handling-transfer-individual/68862)

A Gamification Mechanism for Advertising in Mobile Cloud
[www.irma-international.org/chapter/a-gamification-mechanism-for-advertising-in-mobile-cloud/137704](www.irma-international.org/chapter/a-gamification-mechanism-for-advertising-in-mobile-cloud/137704)

Cockroach Inspired Shelter Seeking for Holonomic Swarms of Flying Robots
[www.irma-international.org/chapter/cockroach-inspired-shelter-seeking-for-holonomic-swarms-of-flying-robots/142025](www.irma-international.org/chapter/cockroach-inspired-shelter-seeking-for-holonomic-swarms-of-flying-robots/142025)