The only chance to meet our robotics challenge is the Cognitive Robotics R&D

Emanuel Diamant

VIDIA-mant, Israel; emanl.245@gmail.com

In Israel, Cognitive Robotics is a non-existing topic. It does not appear neither as a subject of interest at the ICR conferences, nor as a theme for a public discussion, a workshop, or any other professional gathering. What is the reason for such an abstention? Maybe the failure of the European Cognitive Robotics Challenge (a part of a long-lasting FP5-FP7 programme)? Or the agony of DARPA's Intelligent Worrier enterprise? I do not think so – the Israelis stood aside from all these ventures long before all of them have silently decayed. However, despite Israel's lack of interest in these sorrowful stories, lessons from the failures must be learned – a human in a loop (even if the human is a Jew) would not help you to resolve problems when an intelligent robot design will arise as a challenge. Without any doubts, such times, even in Israel, will once come – come inevitably.

It is obvious that future robot would be designed as a human subordinate, a team-working partner, an assistant. That implies that the robot should be able to communicate with the rest of the world in a human language. That implies that the robot should possess some human like cognitive abilities. Cognitive ability implies the capacity to perform information processing. Information processing implies some knowledge about what is information. At this step, the logic chain abruptly breaks – What is information? Nobody knows. Cognitive Robotics ventures have slipped exactly at this point.

I hope that I have a remedy for this problem and I am ready to share it with a friendly audience. The remedy is a new definition of information that can be derived from Kolmogorov's views on the matter framed about 50 years ago. Today, put in my words, the definition sounds like this: **"Information is a linguistic description of structures observable in a given data set"**. (A more detailed explanation could be found on my web-site http://www.vidia-mant.info). Here, it would only be worth to mention that two types of information must be distinguished in this regard – **Physical Information and Semantic Information**.

A segregation between them is a very important novelty put into the common praxis. Another novelty is that, because the subjective nature of semantic information, its creation cannot be formalized. Semantic information, thus, cannot be learned and has to be provided to a system always from the outside, always as a gift, a grant, an offering. The next important outcome from the new definition is the understanding that information descriptions are always reified as a string of words, a piece of text, a narrative.

Only bearing in mind these novelties we can hope to succeed in our Cognitive Robotics challenge.