

Title: Can we develop Gregorian Intelligence for robots?

By Professor *Il Hong Suh, Hanyang University, Korea*

Abstract

One of the most renowned philosophers of our day, Daniel Dennett, said in his book "Kinds of Minds" that our minds are complex fabrics, woven from many different strands and incorporating many different designs. Dennett has classified minds into four different types in evolutionary perspective and the Gregorian creatures is the highest level of mind, using language as a tool of both modeling and acquiring information for survival.

Now a day, robots such as Sony's AIBO, KAIST HUBO, and Honda's ASIMO, has reached a high level of development stage in a sense of reaction or regulation technology. And, the level of development of expertise and planning, which are believed to be part of high-level intelligence, has also reached a high level stage. However, the intelligence in this area is not applicable to all tasks in its current stage but is restricted to specialized applications as such as the Deep Blue, which is a professional system that wins against world chess champions, or STRIPS, a task planning system. This kind of planning intelligence for a restricted area can be seen as a narrow AI. Thus, we can say that General and Practical AI abilities have not yet been developed; therefore interaction, common sense, and vision, the intelligence of Gregorian creatures, are in a relatively low stage of technological development. This type of intelligence is naturally shown by humans, but it is extremely difficult for robots to realize this area of intelligence. It is noted that in the case of humans and other intelligent animals, they have various computational modules considered as cognitive substrates being utilized for various objectives that have been evolved over a long time and which are all embedded in the brain. Unfortunately, such specific modules that being currently used are not clear, and even if we specifically know what modules are used, there are insufficient specific knowledge on why those modules are used, and in particular how to model such modules.

In this talk, some thoughts for developing smart robots are discussed by considering four levels of intelligence arising from evolution. There will be discussed what are key features of intelligence at each level of evolution, what has to be considered to implement each level of intelligence, and what difficulties are expected in achieving natural forms of robot intelligence. In addition, there will be shared some experiences for challenging robot intelligence at INCORL, Hanyang University.