Chapter 3
Consciousness of Motivated, Emotional Mind

ABSTRACT

The efficient functioning of the conscious mind requires motivation. Motivations are both the source and the reason for its development and sophistication. The motivation for intelligent activities is usually to avoid discomfort and seek pleasure. On the other hand, the implementation of complex life plans and the feeling of higher mental states requires motivation through curiosity and through a desire to learn and discover something new. A mind equipped with cognitive awareness has the ability to observe and assess the effects of its actions on the environment. Creating complex mental representations associating actions with distant impressions and effects allows for their emotional assessment. If bodily experiences are to give meaning to what an individual perceives and remembers, then he must be able to assess the value of his experiences for his own good. Using these experiences and learned knowledge an intelligent system gains the ability to take rational actions to achieve its goals, feel the pain and pleasure resulting from such actions, be sensitive to effects of his actions, be conscious. The analysis of one's own situation and the choice of the optimal mode of operation can be interpreted as implementations of the system's own will. The discussion of restrictions on the choices made indicates that this will of the system is by no means free will. Conscious being decisions depend on the momentary mental states in which the mind is in the process of deciding. They depend on the content of what he has in his memory at the moment, his current mood, available knowledge, his patience for analyzing different variants of behavior and ability to act. In addition to known ontological, physical, and biological limitations, and social (for social beings), there are significant limitations related to the content and structural organization of memory, created associations and beliefs shaped by life experiences and interactions with subconscious mind. Assessing the effects of the operation, satisfying, or not satisfying the needs of the system revealed in the above way creates complex emotional states. Structures and processes leading to the creation of emotions, motivating to rational action for the broadly understood own good, constitute a model of a fully conscious, motivated, emotional mind (MEM). Is the presented model really a reductive model? Do mental states even exist? The authors try to answer these and similar questions in this chapter.

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MOTIVATIONS FOR ACTION

It is not enough to have a mind. You still need to be able and willing to use it. An autonomous agent capable of intentional action must still want to do something. He must have motivation. Motivation to act in the animal world had to be created before the first effectors that allowed movement of the body were created. Previously, simple unicellular animals could only move with the current of water, grabbing food on the way. The motivation to obtain this food was a factor of selection in natural development, giving an evolutionary advantage to those single-celled individuals who were able to move toward the source of light, abundance of food, or a higher, more favorable temperature. It was only after the development of motivation-driven motor skills that the brain that could control movement could be created. Without motivation to act, it is impossible to talk about intelligence.

In a robotics joke, the creator of a conscious robot reports his first contact with the intelligent machine, saying, "She said she could think, but for now she has decided not to." In order to achieve consciousness, one must have motivations. It is widely believed that the main motivation for the operation of intelligent systems, including systems governed by natural, animal, and AI brains, is to avoid pain and seek pleasure. The most common source of pain is the scarcity of resources that could meet the generally understood needs. In a natural environment, there is always a shortage of resources necessary for expansion and evolutionary success. And these resources include, among others, available space, available energy sources, available sexual partners, and achievable security. In mathematical modeling using methods of artificial intelligence, this issue can be simplified by assuming that pain and pleasure are mathematical parameters, variously defined depending on the physical parameters describing the system's adaptation to the environment. Such generalized parametric pain sometimes comes down to one parameter, where the lack of pleasure is called a pain. It is to be expected that autonomous agents with a higher degree of consciousness will have more complex motivations. One of the situations when such more complex motivations may appear is the case when the agent feels uncomfortable. It can be said that it "worries," predicting problems in satisfying its needs in the near or distant future.

Janusz Starzyk (Starzyk 2008; Starzyk and Prasad 2011) presented an interesting concept to find higher-level motivations. The concept he presented recognizes reduction of generalized pain as a need requiring fulfillment or satisfaction. Therefore, it is a fundamental motivation for the operation of an intelligent agent—creating foundation for motivated embodied intelligence. By interacting with the mechanism of attention and working memory, pain-driven motivation allows the agent to formulate goals and plan smart actions that lead to satisfaction from pain reduction. However, direct actions to avoid pain can be impossible for various reasons. An intelligent agent can learn to predict that although the pain does not currently occur, it may occur in the future. Complex situations that make it impossible to avoid direct harm, which the author calls primary (lower-order) pain, and anticipation of discomfort in the future lead to creating abstract (higher-order) pain. According to the example given by the author, seeing an empty refrigerator may cause discomfort in predicting hunger. Similarly, looking at an empty wallet may lead to the painful idea that the fridge will remain empty.

This process creates a hierarchy of pains from the original, sensually felt pain to abstract pains, which are subject to logical analysis and reach the conceptual-symbolic layer of our consciousness (Starzyk 2011a; Starzyk et al. 2012). Similarly, a hierarchy of psychological needs may arise due to the lack of resources necessary for survival. Guided by these abstract motivations, we should generate a wealth of behaviors appropriate for highly intelligent, conscious beings. The above mentioned motivation system is designed to give a "sense of existence" to autonomous intelligent robots. And indeed, pain avoiding