The Robot Statology - Operational Understanding of Emotions To Be Embedded In a Robot

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All spectrum of emotions (about emotional spectrum see the our workshop's paper of Dr. Christopher Nehaniv) - from thin aesthetic perception up to rough fits of passion, connected with fear, sex, aggression, famine can be interpreted from the uniform point of view. In a counterbalance to opinion of the our workshop participant Dr. Tadashi Kitamura, I think that it is possible to give a precise definition of emotions to be embedded in a robot. The theory of emotions of robots may be called the theory of possible stationary states of robots or "The Robot Statology".

Definitions:

Emotions are the mechanism of changing of stationary states of a working system (of organism, robot, ...) for providing of it's maximal adaptability .

It is possible to mark out the following operational components of emotions:

- ***Choice*** **(instinctive, intuitive, aesthetically mediated, automatic) of an expedient stationary state of a working system or of some part of a working system.**

- ***Switching*** **(instinctive, intuitive, aesthetically mediated, automatic) of mechanism defining the selected expedient stationary state of a working system or of some of it's part.** The inclusion of a certain status of an organism or of a certain status of one of its subsystems is usually carries **dominant** character - i.e. the alternate statuses are disabled.

- ***Modulation*** **(strengthening or decrease) of mechanisms defining the selected and switched stationary state of a working system or of some of it's part.**

It is believed that the expedient choice-switching-modulation of state of a working system may be not only instinctive, intuitive, aesthetically mediated but and rational. The autonomous rational rating of complex behavioural situations and appropriate adjustment of a state of the robot will be possible after creation of the mathematical device of creative and aesthetic ratings. I have formulated some formalisms in this direction - http://www.iteb.serpukhov.su/GENTL . It is possible, that on a case of urgent and extreme situations the abnormal "emotional" state of the robot permitting in the impulse mode to use all available resources for execution of one task - something similar to stress of alive systems will be always reserved. As well as in case of alive systems, such mode can result in the subsequent partial loss of work capacity (oppression, break-down).

From my point of view it is possible to allocate seven main sequentially passing each other stationary states in which there can be any organism of robot (or of any other working system):

(1) ***Deep rest*** **(there is no availability for direct activation of working activity - deep preservation, hibernation, sleep, ...);**
(2) ***Rest*** **(is availability for direct activation of working activity),**
(3) ***Activation*****,**
(4) ***Strain*****,**
(5) ***Overstrain*****,**
(6) ***Oppression*** **(break-down, illness),**
(7) ***Death*** **(destruction).**

My subject is neurochemistry of emotional structures of brain (of monoaminergic systems). I would discuss the parallels between stationary states of cells, brain, organisms and of robots as neurochemist and as theoretical biologist.