[0076] In a case where external intervention was essential to fulfil the operational requirement of the application modules, one of the critical factors may well be generation of the output signal C by motor centre M_1. Thus, the system learns a secondary response consisting of generation of output C, and performing of internal regulation, when the other critical sensor inputs take the values applicable at a time when normalisation of the system is required. This will generally lead to the system optimising the output C so as to maximise the probability of obtaining external aid. This can also lead to generation of the output C, and triggering of internal regulation processes, even at times when the application module itself does not have an unfulfilled operational requirement. However, in certain circumstances this is desirable, since the system will appear to be acting "in sympathy" with some external agent or external factors.

[0077] It will be appreciated from the foregoing description that the present invention provides a self-biased conditioning architecture and self-biased conditioning scheme which have the following characteristics:

- they provide a developmental strategy for a system, the system consisting of a set of primary response networks, which are very general, and an associative network;
- "reward" is always internally produced based on its self-biased expectation; the worth or reward is relative to presupposed actions of architecturally definitive primary response networks; and

- the original primary response networks do not change; even after conditioning (learning), each of the primary response networks keeps its original pattern of activation, although inhibition and promotion effects which can vary with time act on the motor centre and affect the output from the network.

[0078] Numerous other variations and modifications, besides those discussed above, can be made to the basic preferred embodiment described above, within the scope of the present invention as defined in the appended claims.

Claims

1. System implementing self-biased conditioning, comprising:

   a plurality of sensors (S);
   at least one actuator (C);
   at least one primary response network (1) receiving an input signal from at least one first sensor (S_A) and an input signal from at least one second sensor (S_B) and generating an output signal (O_3) for activating an actuator (C_1), wherein the primary response network (1) comprises:
   an activation node (X) receiving the input signal from said at least one first sensor (S_A) and, in response to a first value of said input signal, outputting a trigger signal (O_1),
   at least one motor centre (M) receiving the trigger signal (O_1) from the activation node (X) and adapted to respond to the trigger signal by generating said output signal (O_3) for activating said actuator (C_1),
   means (y^+, y^-) for applying positive and negative reinforcement signals to the motor centre (M) whereby to promote or inhibit the response of the motor centre (M) to the trigger signal (O_1) from the activation node, and
   at least one expectation node (Y) receiving the input signal from the at least one second sensor (S_B), said input signal from the second sensor being indicative of whether or not the generation of said output signal (O_3) for activating the actuator is appropriate, and for generating an output signal (O_2) indicating when the generation of said output signal (O_3) for activating the actuator is not appropriate;
   means for determining, based on an analysis of at least signals output by the expectation node (Y) and motor centre (M) of the primary response network (1), that the response of the motor centre requires promotion or inhibition; and
   an associative memory (2) generating said positive and negative reinforcement signals based upon the determination made by the determination means.

2. The system according to claim 1, wherein the or each expectation node (Y) of the primary response network (1) is adapted to produce an output signal only when activated by an activation signal from a corresponding activation node (X).

3. The system according to claim 1 or 2, wherein the associative memory (2) is adapted to generate the positive and negative reinforcement signals based on the output signal from at least one sensor (S_i) multiplied by a respective weight (w_i^+, w_i^-).

4. The system according to claim 3, wherein the associative memory (2) is adapted to apply respective weights (w_i^+, w_i^-) the values of which are updated at times when the determination means determines that the response of the