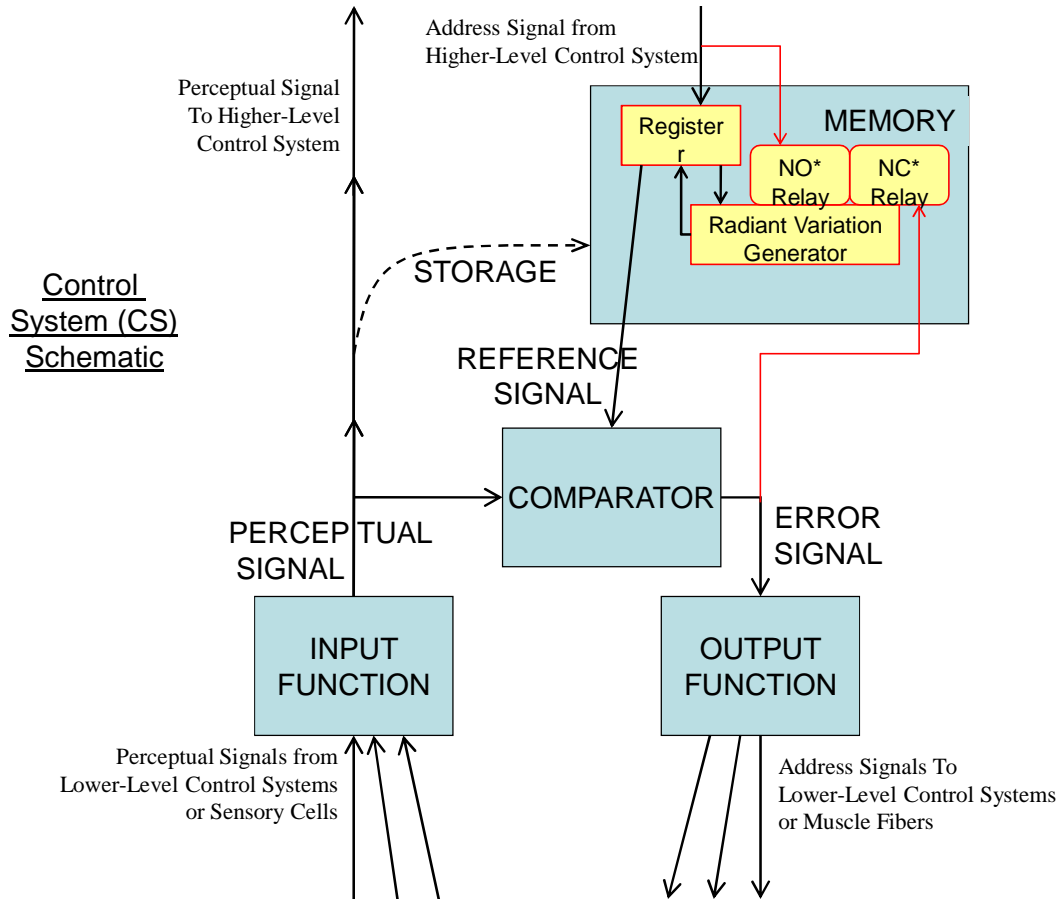


A Learning Mechanism for Control Systems: System Diagram, first cut



As long as an address signal is being received by Register r from a higher level Control System (CS) (subject to the actions of the two relays*) the Radiant Variation Generator copies the reference signal stored in Register r , modifies some of its elements slightly, at random, and stores the modified signal back in Register r ; whereupon, of course, the new reference signal is copied into the comparator and the sequence repeats.

When the incoming address signal eventually stops, usually indicating that the higher CS is getting the input perceptions it is controlling for, the reference signal now held in register r is presumably an improvement on the one before; i.e., on average, the above process is marginally likely to require fewer iterations than before. As it does so, we can say that the subject CS is learning/is being trained to do its job.

*These relays turn the Radiant Variation Generator on and off. They are in series; i.e. both must be closed for the RVG to perform.

The NO (Normally Open) Relay's action, to close and remain closed only while an address signal is detected, is delayed long enough for a complete cycle of the hierarchy to take place.

The NC (Normally Closed) Relay's action, to open and stop the RVG's operation briefly each time a new reference signal is generated which causes the comparator to send an error signal, acts again to allow time for a complete cycle of the hierarchy to take place before a newer reference signal is generated.

The action of each relay thus prevents an erroneous change in the existing reference signal, stored in Register r, if it is in fact the "correct" signal for the job.