

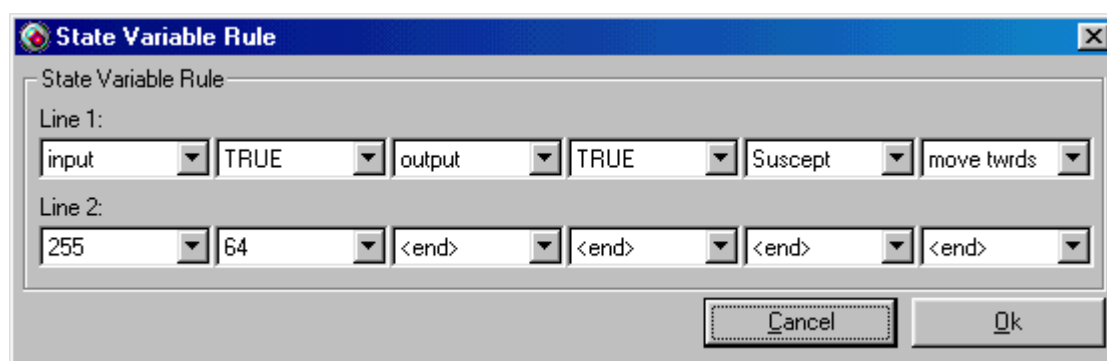
State Variable Rules (SVRules)

State Variable Rules (or SVRules) are genetically defined functions that are used throughout a brain lobe structure to control several aspects of synaptic behaviour, as well as to compute a neurone's state.

State Variable Rules are composed of interpreted opcodes and operands. Each SVRule expression is designed to be interpreted extremely fast (as each neurone's state needs to be calculated, as well as other synaptic behaviours such as the dendrite relaxation functions, for example), non-brittle and “fail-safe”—genetic mutations must never cause syntax errors.

SVRules can compute new state values in many ways. A considerable amount of the possible functions go well beyond the present needs of the brain model in Creatures, giving great scope for alternative brain structures.

SVRules for brain lobes are defined on the various pages of the [brain lobe gene](#). When a State Variable Rule is edited, this window appears:



The SVRule can then be edited by using the drop-down boxes. The expression can consist of up to twelve operands and opcodes, with the “<end>” marker used to mark where the SVRule ends. Example SVRules would be:

state PLUS type0 <end>	Sum of the dendrite class 0 inputs is added to the previous state.
state PLUS type0 MINUS type1 <end>	Dendrite class 0 inputs are excitatory and class 1 inputs are inhibitory.
anded0 <end>	State is the sum of class 0 dendrites or zero if not all the inputs are firing. Previous state is ignored.
state PLUS type0 TIMES chem2 <end>	State is raised by the sum of dendrite class 0 inputs, and is modulated by a chemoreceptor.

SVRules are used in the following areas:

- To calculate the state of a neurone, and to calculate its relaxation function.
- As expressions to control reinforcement, susceptibility, back propagation, forward propagation, strength gain and strength loss in dendrites.

Please note: If you press **Ok** on the SVRule window, and then **Cancel** on the gene window, any changes you made to the SVRules are **not cancelled**!

Click [here](#) for information on recommended further reading.

Brain organ

There is one brain organ per creature, which contains a number of brain lobes, specified in the lobe genes. The

organ gene is responsible for specifying the physical structure that holds the brain, and is the target of any injury to the brain. A creature is defined as dead when this organ dies.