Variability is a prominent feature of neural behavior.

One type of variability is noise. Another type might be chaotic behavior.

Two main sources of intrinsic neural noise are synaptic release noise and ion-channel noise.

Gaussian noise or a chaotic signal is used to control intrinsic behavior of a synapse circuit to vary neurotransmitter release in an unpredictable manner, modeling synaptic release noise.

There are two variable intrinsic signals in the axon hillock circuit: one could force the neuron to fire and the other one could prevent the neuron from firing.

An intrinsic signal forcing the neuron to fire when there is no PSP in fact models the spontaneous firing of the neuron.

A chaotic signal generator using carbon nanotube transistors is presented.

The chaotic generator, synapses and an axon hillock were simulated using carbon nanotube SPICE models, with voltages scaled to match possible electronics range.


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