

## ***Information Technology***

<b><i>Title:</i></b>	<b><i>Artificial Neuron with Phase Encoded Logic (UMD 04-04)</i></b>
<b><i>Inventors:</i></b>	<b><i>Howard Michel</i></b>
<b><i>Applications:</i></b>	Improved chips for data processing
<b><i>Benefits:</i></b>	The invention enables production of more powerful neural chips for integration into data processing networks.
<b><i>Technology Description:</i></b>	<p>A neural chip is an analog or digital integrated circuit that implements several processing elements, which are often referred to as “neurons.” These neurons are independent and operate in parallel. Such neural chips are often used as building blocks for assembling larger networks. The invention provides an analog Very Large-Scale Integration (VLSI) implementation of a simple neuron using phase encoded inputs and complex valued weights. Neurons fabricated according to the invention use high frequency AC signals as inputs and phase-shifted bias signals as weights to the neuron. Such neurons can be programmed to implement all 16 functions of two Boolean variables and 245 of the 256 functions of three Boolean variables without additional logic, neuron stages, and higher order terms. The single neuron devised can be used to create a network of neurons. Non-Boolean functions may also be implemented. Issued US Patent Number <a href="#">7,041,058</a> claims artificial neurons fabricated in accordance with the invention, systems containing the neurons, and methods of data processing using the artificial neurons.</p>
<b><i>Patent Status:</i></b>	<a href="#">US Patent No. 7,401,058.</a>
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