

Spiking Neural P systems

Theory, Applications and Implementations

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Spiking Neural P systems

Introduced by M. Ionescu, Gh. Păun and T. Yokomori at 2006 ¹

- ★ A class of distributed and parallel neural-like computational models.
- ★ A synthesis of two research areas: **Membrane Computing** and **Spiking Neural Network**.
- ★ The time is used as a means to encode information.
- ★ Successful computation: the output neuron spikes exactly twice during the computation.
- ★ Output of a successful computation: the number of time steps elapsed between the two spikes of the output neuron.

¹M. Ionescu, Gh. Păun, T. Yokomori. Spiking Neural P systems. *Fundamenta Informaticae*, June 2006, 71 (2): 279-308

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The monograph is structured into three parts:

- ★ I: Theoretical Aspects.
 - Computational Power.
 - Computational Complexity.

- ★ II: Real-World Applications.
 - Fault diagnosis.
 - Medical Image processing.
 - Information Fusion.
 - Cryptography.
 - Cibersecurity.
 - Mobile robot control.

- ★ III: Implementations.
 - Software simulations.
 - Hardware simulations FPGAs and GPUs.

