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Fuzzy automata and neural associative memories compatible with principles of quantum computation. (English) [\[Zbl 1157.68374\]](#)

Gammerman, A. (ed.), Artificial intelligence and applications. Machine learning. As part of the 26th IASTED international multi-conference on applied informatics. Calgary: International Association of Science and Technology for Development (IASTED); Anaheim, CA: Acta Press (ISBN 978-0-88986-710-9/CD-ROM). 364-369 (2008).

Summary: The paper studies neural structures, such as automata and associative memories which are compatible with quantum mechanics postulates. The proposed neural structures have stochastic weights which are calculated from the solution of Schrödinger's equation. An analysis of the energy spectrum of the stochastic weights is provided and it is proved that a relation analogous to the principle of uncertainty holds. In the case of associative memories the proposed neural model results in an exponential increase of patterns storage capacity (number of attractors).

For the entire collection see [\[Zbl 1154.68012\]](#).

MSC:

[68Q10](#) Modes of computation (nondeterministic, parallel, interactive, probabilistic, etc.)

[68T05](#) Learning and adaptive systems in artificial intelligence

[68Q45](#) Formal languages and automata

Keywords:

[neural structures](#); [Schrödinger's equation](#); [quantum mechanics postulates](#); [energy spectrum](#); [uncertainty principle](#)