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| Disciplina | 006.3 |
| Soggetti | Thermodynamics Statistical physics Dynamical systems Artificial intelligence Complex Systems Artificial Intelligence Statistical Physics and Dynamical Systems |
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| Nota di contenuto | On the statistical-mechanical formulation of neural networks -- Model neurons: From Hodgkin-Huxley to hopfield -- Statistical mechanics for networks of analog neurons -- Properties of neural networks with multi-state neurons -- Adaptive recurrent neural networks and dynamic stability -- Neuronal oscillators: Experiments and models -- Neuronal networks in the hippocampus involved in memory -- Basins of attraction and spurious states in neural networks -- Tailoring the performance of attractor neural networks -- Learning and optimization -- Statistical dynamics of learning -- Learning and retrieving marked patterns -- Learning algorithm for binary synapses -- Statistical mechanics of the perceptron with maximal stability -- Simulation and hardware implementation of competitive learning neural networks -- Learning in multilayer networks: A geometric computational approach -- Storage capacity of diluted neural networks -- Dynamics and storage capacity of neural networks with sign-constrained weights -- |

The neural basis of the locomotion of nematodes -- Reversibility in neural processing systems -- Lyapunov functional for neural networks with delayed interactions and statistical mechanics of temporal associations -- Semi-local signal processing in the visual system -- Statistical mechanics and error-correcting codes -- Synergetic computers — An alternative to neurocomputers -- Dynamics of the Kohonen map -- Equivalence between connectionist classifiers and logical classifiers -- On Potts-glass neural networks with biased patterns -- Ising-spin neural networks with spatial structure -- Kinetically disordered lattice systems -- A programming system for implementing neural nets -- An auto-augmenting neural network architecture for diagnostic reasoning -- Formal integrators and neural networks -- Disordered models of acquired dyslexia -- Higher order memories in optimally structured neural networks -- Random Boolean networks for autoassociative memory: Optimization and sequential learning.

Sommario/riassunto

Combined for researchers and graduate students the articles from the Sitges Summer School together form an excellent survey of the applications of neural-network theory to statistical mechanics and computer-science biophysics. Various mathematical models are presented together with their interpretation, especially those to do with collective behaviour, learning and storage capacity, and dynamical stability.
