


Data Analysis and Machine Learning		
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Keywords	Multilayered Neural Network, Numerical modeling, Sensor data analysis (61040)	

Research Topics
<ul style="list-style-type: none"> ● Application of multiple neural network systems ● Analyzing various sensor data ● Studying traffic jam and flow mechanisms using numerical simulation

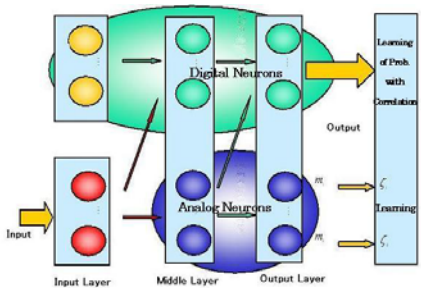
Research Seeds

Internet technology enables us to collect information of various types more easily. Sensor technologies make us monitor various time sequential activities such as human activity and environmental conditions. Such data collected through the internet and/or various sensors are designated as “Big data”. The analysis of “Big data” and its applications are recent hot research topics. Deep learning, artificial intelligence, and/or machine learning are new technologies that provide us means of extracting certain meanings from such large amounts of data. A neural network is fundamentally important for those technologies.

Realization of a flexible information processing system based on neural networks might provide us a new type of efficient data analysis.

Through continuous research work on stochastic digital neural networks and analog neural networks obtained by application of the mean field approximation to digital one, we have derived a learning rule that shows excellent scalability and a stable learning tendency. This scalability guarantees a stable learning tendency without regard to network size and provides us many degrees of freedom for constructing network structures. These results demonstrate that we can obtain a system with higher ability by optimizing the structure of multiple neural networks.

We explore the possibility of constructing a new flexible support system for human information processing activities by multiplying these neural network systems including digital and analog neurons. Digital and analog neuron systems are presumed to share processing jobs depending on the feature of cases. We might be able to construct more generalized processing systems by combining these with respect to a type of problem. This multiple neural network structure can be applicable to various systems such as flexible data processing systems for various ambiguous data, self-organizing computer networks, and data transfer controlling systems on multimedia communication networks.



Related Technology

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