Sparse Distributed Memory

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A New Training Algorithm for Kanerva's Sparse Distributed Memory

Sparse Distributed Memory was proposed by Pentti Kanerva as a model of human long term memory. He presented it as an architecture that could represent associations between words and images. In the context of the model, associations are represented in the memory by the presence of co-occurring elements, which are referred to as patterns. The model is based on the idea that memory is stored as a network of connections between nodes, with each node representing a concept or idea. The connections between nodes are weighted, with stronger connections indicating a stronger association between the concepts represented by the nodes.

The model is characterized by its ability to store a vast amount of information in a relatively small memory space. It is also able to recall information from the memory in a distributed manner, meaning that information is not stored in a single location but is spread across multiple nodes. This allows for a more robust and flexible representation of information, as well as a more efficient use of memory resources.

The Sparse Distributed Memory model has been applied to a variety of domains, including natural language processing, image recognition, and machine learning. It has been shown to be particularly effective in tasks that involve processing large amounts of data, such as text and image classification.

The model has also been used to study the neural basis of memory and learning, and has been compared to other models of memory, such as those proposed by Atkinson and Shiffrin.

Overall, the Sparse Distributed Memory model provides a powerful framework for understanding how information is represented and accessed in memory. Its ability to handle large amounts of data and its distributed nature make it a valuable tool for researchers in a variety of fields.