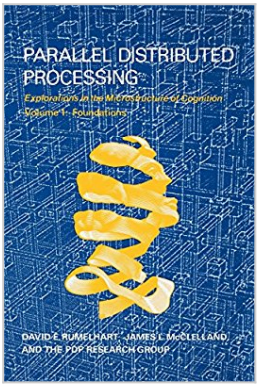

Parallel Distributed Processing, Vol. 1: Foundations

By David E. Rumelhart, James L. McClelland, PDP Research Group

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What makes people smarter than computers? These volumes by a pioneering neurocomputing group suggest that the answer lies in the massively parallel architecture of the human mind. They describe a new theory of cognition called connectionism that is challenging the idea of symbolic computation that has traditionally been at the center of debate in theoretical discussions about the mind.

The authors' theory assumes the mind is composed of a great number of elementary units connected in a neural network. Mental processes are interactions between these units which excite and inhibit each other in parallel rather than sequential operations. In this context, knowledge can no longer be thought of as stored in localized structures; instead, it consists of the connections between pairs of units that are distributed throughout the network.

Volume 1 lays the foundations of this exciting theory of parallel distributed processing, while Volume 2 applies it to a number of specific issues in cognitive science and neuroscience, with chapters describing models of aspects of perception, memory, language, and thought.

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Editorial Review

Amazon.com Review
This two-volume work is now considered a classic in the field. It presents the results of the Parallel Distributed Processing (PDP) group's work in the early 1980s and provides a good overview of the earlier neural network research. The PDP approach (also known as connectionism among other things) is based on the conviction that various aspects of cognitive activity are thought of in terms of massively parallel processing. The first volume starts with the general framework and continues with an analysis of learning mechanisms and various mathematical and computational tools important in the analysis of neural networks. The chapter on backpropagation is written by Rumelhart, Hinton, and Williams, who codiscovered the algorithm in 1986. The second volume is written with a psychological and biological emphasis. It explores the relationship of PDP to various aspects of human cognition. The book is a comprehensive research survey of its time and most of the book's results and methods are still at the foundation of the neural network field.

Review

Rumelhart and McClelland propose that what is stored in memory is not specific facts or events, but rather the relationships between the various aspects of those facts or events as they are encoded in groupings of neuronal cells or patterns of cell activity.

(**Daniel Coleman** *The New York Times*)

The most intense, most effective and most mind-stretching view of neurocomputing origins, theories and concerns to yet reach print.

(*Intelligence*)

From the Back Cover
This book describes the authors work in developing a theoretical framework for describing parallel distributed processing activity and in applying the framework to the development of models of aspects of perception, memory, language, and thought.

Users Review

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