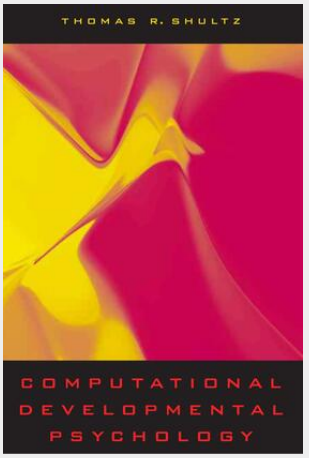
Shultz

Computational Developmental Psychology

An overview of the emerging discipline of computational developmental psychology, emphasizing the use of constructivist neural networks.Despite decades of scientific research, the core issues of child development remain too complex to be explained by traditional verbal theories. These issues include structure and transition, representation and processing, innate and experiential determinants of development, stages of development, the purpose and end of development, and the relation between knowledge and learning. In this book Thomas Shultz shows how computational modeling can be used to capture these complex phenomena, and in so doing he lays the foundation for a new subfield of developmental psychology, computational developmental psychology.A principal approach in developmental thinking is the constructivist one. Constructivism is the Piagetian view that the child builds new cognitive structures by using current mental structures to understand new events. In this book Shultz features constructivist models employing networks that grow as well as learn. This allows models to implement synaptogenesis and neurogenesis in a way that allows qualitative changes in processing mechanisms. The book's appendices provide additional background on the mathematical concepts used, and a companion Web site contains easy-to-use computational packages.



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