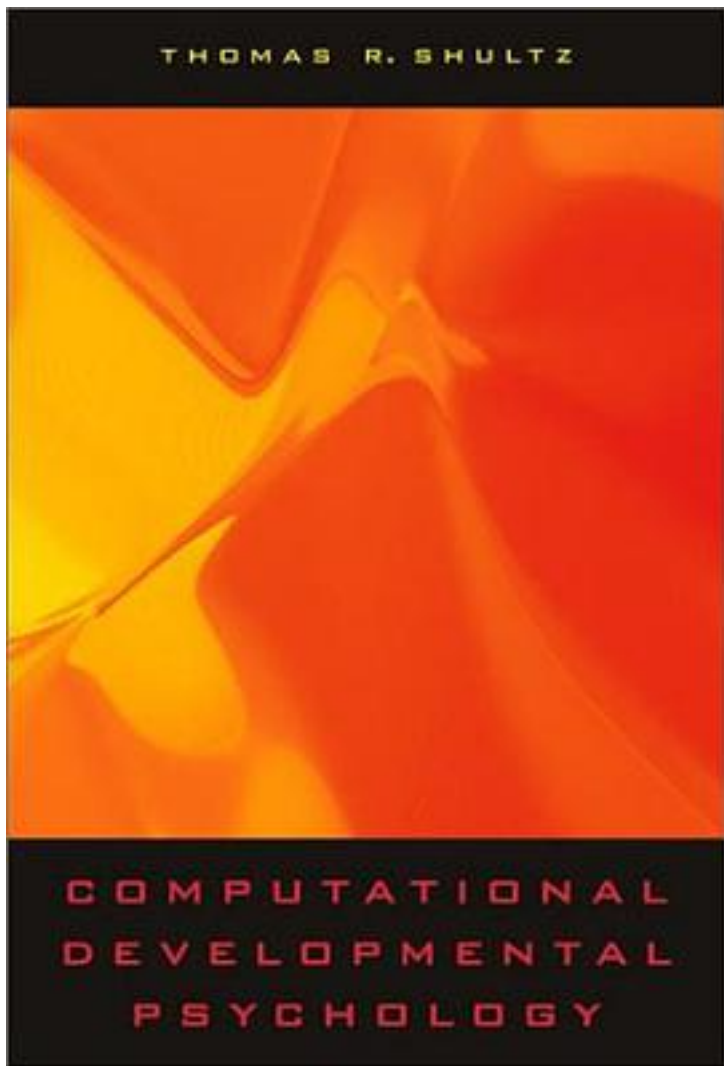# Computational Developmental Psychology

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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.

作者介绍:

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标签

认知科学

机器学习

心理学

人工智能

CS

AI

评论

这本书讲述一个跨学科领域，计算发展心理学，即计算机建模模拟人的心理发展，更具体一点，是采用连接主义，而非基于规则的符号主义的计算机模型。作者主要推荐的是他所发明的CC算法，并认为在发展心理学中该算法相比BP算法更适合。CC算法的特色就是动态改变hidden units的数量，这与人脑神经元连接的建立与消亡更为接近，而且在相应模型中产生了很多有意思的结果。这本书所举的例子和解说都是来自心理学，特别是皮亚杰理论和研究中的经典范式，这些对于纯计算机专业学生来说基本上是天书；计算机建模研究中不可避免的涉及很多技术方面的事，然而此书并没有细致介绍，也就是说你读完这书也编不出一个程序。作者显然并不想教你编程，而是讨论了很多理论问题，比如发展自身的本质、发展的变化本质、计算机模型能帮助心理学更进一步等等。

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