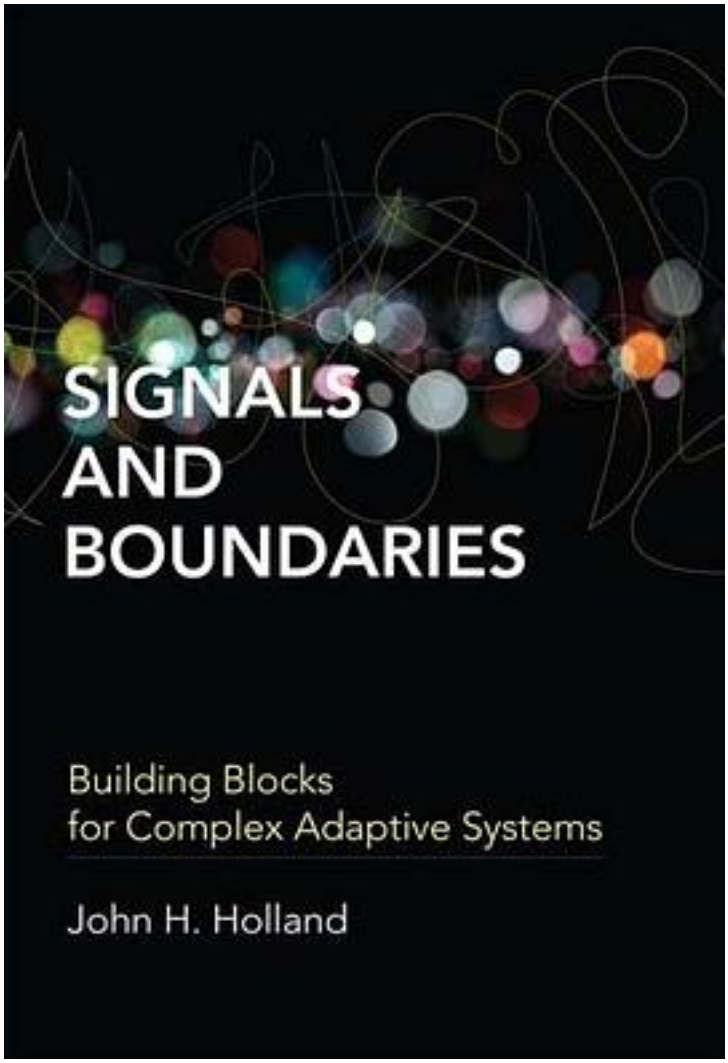
Signals and Boundaries



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Complex adaptive systems (cas), including ecosystems, governments, biological cells, and markets, are characterized by intricate hierarchical arrangements of boundaries and signals. In ecosystems, for example, niches act as semi-permeable boundaries, and smells and visual patterns serve as signals; governments have departmental hierarchies with memoranda acting as signals; and so it is with other cas. Despite a wealth of data and descriptions concerning different cas, there remain many unanswered questions about “steering” these systems. In Signals and Boundaries, John Holland argues that understanding the origin of the intricate signal/border hierarchies of these systems is the key to answering such questions. He develops an overarching framework for comparing and steering cas through the mechanisms that generate their signal/boundary hierarchies.

Holland lays out a path for developing the framework that emphasizes agents, niches, theory, and mathematical models. He discusses, among other topics, theory construction; signal-processing agents; networks as representations of signal/boundary interaction; adaptation; recombination and reproduction; the use of tagged urn models (adapted from elementary probability theory) to represent boundary hierarchies; finitely generated systems as a way to tie the models examined into a single framework; the framework itself, illustrated by a simple finitely generated version of the development of a multi-celled organism; and Markov processes.

作者介绍:

John H. Holland is Professor of Psychology and Professor of Computer Science and Engineering at the University of Michigan; he is also Trustee and External Professor at the Santa Fe Institute. He is the author of Hidden Order: How Adaptation Builds Complexity and other books.

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评论

将语言比作CAS是一个很好的想法，但不能操作，就只能是想法。好在我们还有QL。//一直没有买，前几日WSY先生在邮件中提到此书，于是就在卓越买了，比美国amazon贵一些，但快啊。这本书中有关于语言的章节哦。

通俗易懂得把CAS的大框架介绍出来 接下来得找本Top Down的

Highly likely, in this book J. H. Holland tries to summarize his last thoughts on complex adaptive system in his old age. Could serve as a book for inspriations for anyone who are working in a field of CAS that is discussed in the book. The theorization looks too general to be immediately useful.

作者在《Hidden Order》一书中完成了CAS的建模，而本书聚焦于模型的运作和高级特征涌现的过程推演。DGS概念的提出以及Markov Process的引入将微观模型和宏观涌现链接起来，与前作形成严谨而自洽的CAS理论体系

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书评

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