

**Haykin, Simon. *Cognitive Dynamic Systems – Perception-Action Cycle, Radar, and Radio*. New York, NY: Cambridge University Press, 2012, 309 pp. \$75.00 (Hardbound).**

The principles of cognition are becoming increasingly important in the areas of signal processing, communications, and control. In this ground-breaking book, Simon Haykin, a pioneer in the field and an award-winning researcher, educator, and author, sets out the fundamental ideas of cognitive dynamic systems. Weaving together the various branches of study involved, he demonstrates the power of cognitive information processing and highlights a range of future research directions.

The book begins with a discussion of the core topic, cognition, dealing in particular with the perception-action cycle. Then, the foundational topics, power spectrum estimation for sensing the environment, Bayesian filtering for environmental state estimation, and dynamic programming for action in the environment, are discussed. Building on these foundations, detailed coverage of two important applications of cognition, cognitive radar and cognitive radio, is presented.

Blending theory and practice, this insightful book is aimed at all graduate students and researchers looking for a thorough grounding in this fascinating field.

**Simon Haykin** is the Director of the Cognitive Systems Laboratory at McMaster University, Canada. He is a pioneer in adaptive signal processing theory and applications in radar and communications, areas of research that have occupied much of his professional life. For the past 10 years he has focused his entire research interests on cognitive dynamic systems: cognitive radar, cognitive radio, cognitive control, and cognition applied to the cocktail party processor for the hearing impaired. He is a Fellow of the IEEE and the Royal Society of Canada, and is the recipient of the Henry Booker Gold Medal from URSI (2002), the Honorary Degree of Doctor of Technical Sciences from ETH Zentrum, Zurich (1999), and many other medals and prizes. In addition to the seminal journal papers "Cognitive radio" and "Cognitive radar," he has also written or co-written nearly 50 books including a number of best-selling textbooks in the fields of signal processing, communications, and neural networks and learning machines.