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The Evolution of an Invisible Science

From Cybernetics to Awareness Robots

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This book provides insights into the ideas of dynamics and their control for those with a background in secondary education only. The book highlights that artificial neural networks, which are today in great demand in artificial intelligence (AI), such as deep learning, first emerged in learning control systems and classification for decision making by computers, which in itself has become part of computer controlled systems. The mathematical techniques of AI can all be used in control systems, hence this book considers AI to be a field among the control sciences. After the age of mechanical and electrical machines, the age of computers and information technology, we now live in the age of control that includes intelligent robotics.

This book leads the reader through some of the main concepts of control sciences that have become pervasive in most of the new technologies of recent times. Areas of control sciences rely heavily on mathematics, as do areas of advanced physics. Control is not celebrated as a science, to say the least, and yet it is important. It has enabled high quality telephony, the creation of comfortable passenger jets and reusable space rockets. It is used in new developments of power electronics, in communications electronics, in vehicles on the ground, on the surface of and under water, in acoustic electronics, in active noise control by cancelling waves, in medical and manufacturing robots with computer vision, and now in renewable energy technologies and social media through echo cancellation. Control sciences are also an area of human knowledge that provides hard evidence for the usefulness of highly abstract mathematics, which is way beyond the calculations of algebra.

River Publishers Series in Automation Control and Robotics

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ROBOTS

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