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Sinopsis

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Self-reconfigurable robots are constructed of robotic modules that can be connected in many different ways. These modules move in relationship to each other, which allows the robot as a whole to change shape. This shapeshifting makes it possible for the robots to adapt and optimize their shapes for different tasks. Thus, a self-reconfigurable robot can first assume the shape of a rolling track to cover distance quickly, then the shape of a snake to explore a narrow space, and finally the shape of a hexapod to carry an artifact back to the starting point. The field of self-reconfigurable robots has seen significant progress over the last twenty years, and this book collects and synthesizes existing research previously only available in widely scattered individual papers, offering an accessible guide to the latest information on self-reconfigurable robots for researchers and students interested in the field.

Self-Reconfigurable Robots focuses on conveying the intuition behind the design and control of self-reconfigurable robots rather than technical details. Suggestions for further reading refer readers to the underlying sources of technical information. The book includes descriptions of existing robots and a brief history of the field; discussion of module design considerations, including module geometry, connector design, and computing and communication infrastructure; an in-depth presentation of strategies for controlling self-reconfiguration and locomotion; and exploration of future research challenges.

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