Exploring robotic minds actions, symbols, and consciousness as self-organizing dynamic phenomena

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How do minds work? In Exploring Robotic Minds: Actions, Symbols, and Consciousness as Self-Organizing Dynamic Phenomena, Professor Jun Tani reviews key experiments within his own pioneering neurorobotics research project aimed at answering this fundamental and fascinating question. The book shows how symbols and concepts representing the world can emerge via deep learning within robots, by using specially designed neural network architectures by which, given iterative interactions between top-down proactive subjective and intentional processes for plotting action, and bottom-up updates of the perceptual reality after action, the robot is able to learn to isolate, to identify, and even to infer salient features of the operational environment, modifying its behavior based on anticipations of both objective and social cues. Through permutations of this experimental model, the book then argues that longstanding questions about the nature of consciousness and freewill can be addressed through an understanding of the dynamic structures within which, in the course of normal operations and in a changing operational environment, necessary top-down/bottom-up interactions arise. Written in clear and accessible language, this book opens a privileged window for a broad audience onto the science of artificial intelligence and the potential for artificial consciousness, threading cognitive neuroscience, dynamic systems theory, robotics, and phenomenology through an elegant series of deceptively simple experiments that build upon one another and ultimately outline the fundamental form of the working mind.