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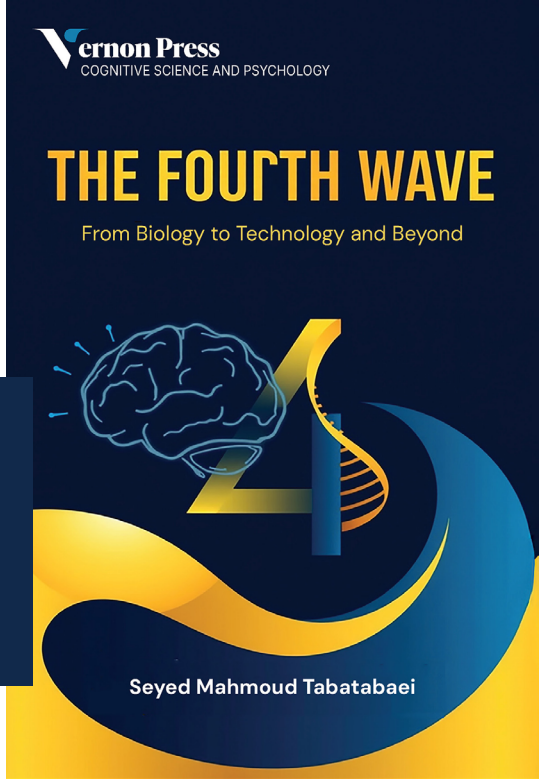
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Seyed Mahmoud Tabatabaei

The Fourth Wave

From Biology to Technology and Beyond

COGNITIVE SCIENCE AND PSYCHOLOGY

About the author

Prof. Seyed Mahmoud Tabatabaei, PhD, is a Professor of Cognitive Neuroscience at the Department of Medical Physiology, Tabriz Medical Sciences Branch, Islamic Azad University, Iran. He is the founder and director of the Synapse Neuroscience Center in Tabriz, where for over a decade he has specialized in quantitative EEG (QEEG), neurofeedback, transcranial direct current stimulation (tDCS), and repetitive transcranial magnetic stimulation (rTMS) for the treatment of neuropsychiatric disorders including ADHD, depression, anxiety, autism, and Alzheimer's disease.
Dr. Tabatabaei holds a PhD in Cognitive Neuroscience and has supervised more than 37 doctoral theses and 115 master's theses in the fields of cognitive science, neuropsychology, and behavioral neuroscience. His research integrates molecular genetics (polymorphisms in ApoE, DAT1, BDNF, and COMT genes) with neuromodulation and artificial intelligence, bridging biological and computational approaches to the mind.
He has published extensively on neurofeedback protocols, QEEG biomarkers, and the effects of tDCS on executive functions, working memory, and emotional regulation. His clinical and research experiences—spanning over 500 patients and numerous controlled trials—inform the interdisciplinary framework of 'The Fourth Wave.' Dr. Tabatabaei is also a reviewer for several international journals and a contributor to global discussions on neuroethics, cognitive liberty, and the future of human enhancement.

Summary

We stand at the threshold of a new era: The Fourth Wave. Unlike previous revolutions that transformed the external world—agriculture, industry, information—the Fourth Wave begins from within humanity, at the intersection of genomics, neurotechnology, and artificial intelligence. This book proposes a groundbreaking framework where biology and technology converge to reshape cognition, metacognition, and human identity itself. Drawing on empirical evidence from neuroscience, clinical neurology, and AI research, 'The Fourth Wave' explores how tools such as CRISPR gene editing, transcranial direct current stimulation (tDCS), neurofeedback, and brain-computer interfaces (BCIs) are not merely treating disorders but actively redesigning the human mind. It introduces the concept of «designed minds» and examines the emergence of artificial metacognition, hybrid human-machine networks, and the philosophical redefinition of consciousness, autonomy, and mortality. Through twenty-three interdisciplinary chapters—from molecular biology to planetary evolution—the book balances rigorous science with forward-looking speculation. It serves as a reference for researchers, a methodological aid for clinicians, a textbook for advanced courses in cognitive science and philosophy of AI, and a manifesto for anyone concerned with the ethical and existential dimensions of human enhancement. 'The Fourth Wave' does not predict a fixed future but invites readers into an endless journey of questions, possibilities, and responsible innovation.

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