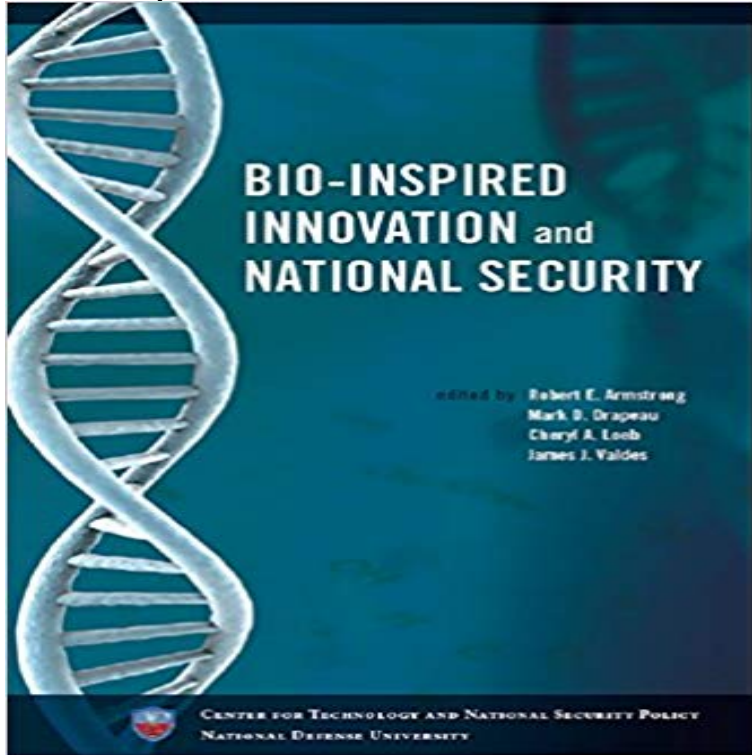


Bio-inspired Innovation and National Security



This volume is about applications of the biological sciences, here called biologically inspired innovations, to the military. Rather than treating biology as a series of threats to be dealt with, such innovations generally approach the biological sciences as a set of opportunities for the military to gain strategic advantage over adversaries. These opportunities range from looking at everything from genes to brains, from enhancing human performance to creating renewable energy, from sensing the environment around us to harnessing its power. Table of Contents List of Illustrations Foreword Andrew W. Marshall Introduction part one Perspectives on Biological Warfare chapter 1 Biotech Impact on the Warfighter Thomas X. Hammes Chapter 2 New Biological Advances and Military Medical Ethics Edmund G. Howe chapter 3 The Life Sciences, Security, and the Challenge of Biological Weapons: An Overview Michael Moodie Chapter 4 Biological Warfare: A Warfighting Perspective John B. Alexander part two Biomolecular Engineering chapter 5 Abiotic Sensing James J. Valdes, Andrew Ellington, William E. Bentley, Roy G. Thompson, and James P. Chambers chapter 6 Biosensors and Bioelectronics Dimitra Stratis-Cullum and James Sumner chapter 7 Bioenzymes and Defense Adrienne Huston chapter 8 Bioenergy: Renewable Liquid Fuels Michael Ladisch chapter 9 Bio-inspired Materials and Operations Erica R. Valdes part three Bio-inspired Machines chapter 10 Learning Unmanned Vehicle Control from Echolocating Bats Eric W. Justh chapter 11 Neurorobotics: Neurobiologically Inspired Robots Jeffrey Krichmar chapter 12 Biomimetic, Sociable Robots for Human-Robot Interaction Eleanore Edson, Judith Lytle, and Thomas McKenna chapter 13 Biomechanically Inspired Robotics John Socha and Justin Grubich chapter 14 Biological Automata

and National Security Yaakov Benenson
part four Human Applications chapter 15
Enhanced Human Performance and
Metabolic Engineering James J. Valdes and
James P. Chambers chapter 16 Functional
Neuroimaging in Defense Policy Richard
Genik III, Christopher Green, and David C.
Peters II chapter 17 Forging Stress
Resilience: Building Psychological
Hardiness Paul Bartone chapter 18
Neuroplasticity, Mind Fitness, and Military
Effectiveness Elizabeth Stanley chapter 19
Bio-inspired Network Science Joao
Hespanha and Francis Doyle III Part five
Implications for the Department of Defense
chapter 20 Ethics and the Biologized
Battlefield: Moral Issues in 21st-century
Conflict William D. Casebeer chapter 21
Legal Issues Affecting Biotechnology
Joseph Rutigliano, Jr. chapter 22 Building
the Nonmedical Bio Workforce for 2040
Timothy Coffey and Joel Schnur
Conclusion About the Contributors About
the Author

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