

# **Cognitive Systems Monographs**

Volume 24

## **Series editors**

Rüdiger Dillmann, University of Karlsruhe, Karlsruhe, Germany  
e-mail: ruediger.dillmann@kit.edu

Yoshihiko Nakamura, Tokyo University, Tokyo, Japan  
e-mail: nakamura@ynl.t.u-tokyo.ac.jp

Stefan Schaal, University of Southern California, Los Angeles, CA, USA  
e-mail: sschaal@usc.edu

David Vernon, Italian Institute of Technology, Genoa, Italy  
e-mail: david@vernon.eu

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The Cognitive Systems Monographs (COSMOS) publish new developments and advances in the fields of cognitive systems research, rapidly and informally but with a high quality. The intent is to bridge cognitive brain science and biology with engineering disciplines. It covers all the technical contents, applications, and multidisciplinary aspects of cognitive systems, such as Bionics, System Analysis, System Modelling, System Design, Human Motion, Understanding, Human Activity Understanding, Man-Machine Interaction, Smart and Cognitive Environments, Human and Computer Vision, Neuroinformatics, Humanoids, Biologically motivated systems and artefacts Autonomous Systems, Linguistics, Sports Engineering, Computational Intelligence, Biosignal Processing, or Cognitive Materials as well as the methodologies behind them. Within the scope of the series are monographs, lecture notes, selected contributions from specialized conferences and workshops.

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Tijana Ivancevic · Helen Greenberg  
Ronald Greenberg

# Enhancing Performance and Reducing Stress in Sports: Technological Advances

 Springer

Tijana Ivancevic  
Tesla Science Evolution Institute  
Adelaide  
Australia

Helen Greenberg  
Ronald Greenberg  
Diamond International Corporation  
Adelaide  
Australia

ISSN 1867-4925

ISBN 978-3-662-44095-7

DOI 10.1007/978-3-662-44096-4

ISSN 1867-4933 (electronic)

ISBN 978-3-662-44096-4 (eBook)

Library of Congress Control Number: 2014944323

Springer Heidelberg New York Dordrecht London

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Printed on acid-free paper

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This book, *Enhancing Performance and Reducing Stress in Sports: Technological Advances* is intended to increase awareness of the human body and sports-related injuries, as well as their prevention and rehabilitation. It is not in any way designed to be used as a medical reference for the diagnosis or treatment of any trauma. Neither Springer, Diamond International Corporation, the Sports Academy, nor the authors Tijana Ivancevic, Helen Greenberg and Ronald Greenberg, can be responsible for any actions which result from use or misuse of this material. Qualified medical professionals should be consulted for diagnosis of injuries.

*Authors Ronald and Helen Greenberg wish to dedicate this book and their underlying work over these many years to their beautiful children Michael, Chamunda, David, Zarina, Erez and Saul, their lovely partners Louisa, Chantelle, Michelle and Dhananjay, and their wonderful granddaughter Heidi.*

*Author Tijana Ivancevic wishes to thank her beautiful mother Ljiljana Jovanovic, who has supported her wholeheartedly all these years.*

# Preface

This monograph gives a modern introduction to a futuristic view of enhanced sports performance, injury prevention and health. Introducing state-of-the-art techniques for current sport and health technologies, particularly neuromuscular electrical stimulation, oxygen infusion, infrared and lymphatic cleaning, we present an essential part of every future athlete's training, competition and health maintenance. Discoveries included in this book are a result of the collaborative work between Diamond International Corporation, Adelaide, Australia and the Sports Academy and Institute for Sports Medicine, Serbia, Belgrade.

Chapter 1 introduces the Diamond Sports Protocol, including modern technologies in sports treatments and therapies.

Chapter 2 provides the scientific theoretical background for this book, which is later applied to modern technological advances (presented in Chap. 3). This background theory ranges from the neurophysiological to thermodynamical bases of human movement, across anatomical, physiological, mechanical and computational aspects.

Chapter 3 presents modern technological advances for the development of high-performance human movements, reducing training- and competition-based stress on athletes and preventing common mechanical and sports-related neuro-musculo-skeletal injuries. All the technological advances presented in this chapter are based on the basic scientific theory of human movement given in Chap. 2.

Potential readership of this book includes everyone interested in enhanced sports performance, fast and effective rehabilitation from training and competition and sports injury prevention. To make reading simple, all the necessary background knowledge is given in the book.

Adelaide, May 2014

Tijana Ivancevic  
Helen Greenberg  
Ronald Greenberg

# Acknowledgments

We express our sincere gratitude to the *Springer* book series *Cognitive Systems Monographs* and especially to the Editor, Dr. Thomas Ditzinger. We also wish to thank the Sports Academy of Belgrade, Profs. Leon Lukman and Aleksandar Lukman, and the Red Star Sports Club, Belgrade.



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