

# CONTENTS

<i>List of figures and tables</i>	viii
<i>Acknowledgements</i>	xii
Introduction	1
<b>PART I</b>	
<b>Theories and models</b>	<b>5</b>
1 Theoretical models of motor control and motor learning <i>Adrian M. Haith and John W. Krakauer</i>	7
2 What can we learn from animal models? <i>Eric M. Rouiller</i>	29
3 Postural control by disturbance estimation and compensation through long-loop responses <i>Thomas Merguer</i>	50
4 Motor learning explored with myoelectric and neural interfaces <i>Andrew Jackson and Kianoush Nazarpour</i>	71
5 Biomechanical and neuromechanical concepts for legged locomotion: Computer models and robot validation <i>Andre Seyfarth, Sten Grimmer, Daniel Häufle, Horst-Moritz Maus, Frank Peucker and Karl-Theodor Kalveram</i>	90

<b>PART II</b>		
<b>Basic aspects of motor control and learning</b>		<b>111</b>
6	Visual activation of short latency reinforcement mechanisms in the basal ganglia <i>Nicolas Vautrelle, Mariana Leriche and Peter Redgrave</i>	113
7	The role of augmented feedback in human motor learning <i>Christian Leukel and Jesper Lundbye-Jensen</i>	135
8	Neuroscientific aspects of implicit motor learning in sport <i>Frank Zhu, Jamie Poolton and Rich Masters</i>	155
9	Mirror neurons and imitation <i>Stefano Rozzi, Giovanni Buccino and Pier F. Ferrari</i>	175
<b>PART III</b>		
<b>Motor control and learning in locomotion and posture</b>		<b>195</b>
10	Neural control of walking <i>Michael J. Grey, Laurent Bouyer and Jens Bo Nielsen</i>	197
11	Adaptive plasticity of gait <i>Laurent Bouyer, Michael J. Grey and Jens Bo Nielsen</i>	213
12	Motor control and motor learning in stretch-shortening cycle movements <i>Wolfgang Taube, Christian Leukel and Albert Gollhofer</i>	231
13	Postural control and balance training <i>Wolfgang Taube and Albert Gollhofer</i>	252
<b>PART IV</b>		
<b>Motor control and learning in voluntary actions</b>		<b>281</b>
14	Body schema, illusions of movement and body perception <i>Mark Schram Christensen</i>	283
15	Voluntary movement: Limitations and consequences of the anatomy and physiology of motor pathways <i>John C. Rothwell and Jens Bo Nielsen</i>	304
16	Acute and long-term neural adaptations to training <i>Jacques Duchateau, Tibor Hortobágyi and Roger M. Enoka</i>	319

*Contents*

**PART V**

**Challenges in motor control and learning** **351**

17 Motor control and motor learning under fatigue conditions 353

*Janet L. Taylor*

18 Movement disorders: Implications for the understanding of motor control 384

*Michèle Hubli and Volker Dietz*

*Index* 409