

# Contents

<b>Brain–Computer Interfaces: A Gentle Introduction . . . . .</b>	<b>1</b>
Bernhard Graitmann, Brendan Allison, and Gert Pfurtscheller	
<b>Brain Signals for Brain–Computer Interfaces . . . . .</b>	<b>29</b>
Jonathan R. Wolpaw and Chadwick B. Boulay	
<b>Dynamics of Sensorimotor Oscillations in a Motor Task . . . . .</b>	<b>47</b>
Gert Pfurtscheller and Christa Neuper	
<b>Neurofeedback Training for BCI Control . . . . .</b>	<b>65</b>
Christa Neuper and Gert Pfurtscheller	
<b>The Graz Brain–Computer Interface . . . . .</b>	<b>79</b>
Gert Pfurtscheller, Clemens Brunner, Robert Leeb, Reinhold Scherer, Gernot R. Müller-Putz and Christa Neuper	
<b>BCIs in the Laboratory and at Home: The Wadsworth Research Program . . . . .</b>	<b>97</b>
Eric W. Sellers, Dennis J. McFarland, Theresa M. Vaughan, and Jonathan R. Wolpaw	
<b>Detecting Mental States by Machine Learning Techniques: The Berlin Brain–Computer Interface . . . . .</b>	<b>113</b>
Benjamin Blankertz, Michael Tangermann, Carmen Vidaurre, Thorsten Dickhaus, Claudia Sannelli, Florin Popescu, Siamac Fazli, Márton Danóczy, Gabriel Curio, and Klaus-Robert Müller	
<b>Practical Designs of Brain–Computer Interfaces Based on the Modulation of EEG Rhythms . . . . .</b>	<b>137</b>
Yijun Wang, Xiaorong Gao, Bo Hong, and Shangkai Gao	
<b>Brain–Computer Interface in Neurorehabilitation . . . . .</b>	<b>155</b>
Niels Birbaumer and Paul Sauseng	
<b>Non Invasive BCIs for Neuroprostheses Control of the Paralysed Hand</b>	<b>171</b>
Gernot R. Müller-Putz, Reinhold Scherer, Gert Pfurtscheller, and Rüdiger Rupp	

<b>Brain–Computer Interfaces for Communication and Control in Locked-in Patients . . . . .</b>	185
Femke Nijboer and Ursula Broermann	
<b>Intracortical BCIs: A Brief History of Neural Timing . . . . .</b>	203
Dawn M. Taylor and Michael E. Stetner	
<b>BCIs Based on Signals from Between the Brain and Skull . . . . .</b>	221
Jane E. Huggins	
<b>A Simple, Spectral-Change Based, Electrocorticographic Brain–Computer Interface . . . . .</b>	241
Kai J. Miller and Jeffrey G. Ojemann	
<b>Using BCI2000 in BCI Research . . . . .</b>	259
Jürgen Mellinger and Gerwin Schalk	
<b>The First Commercial Brain–Computer Interface Environment . . . . .</b>	281
Christoph Guger and Günter Edlinger	
<b>Digital Signal Processing and Machine Learning . . . . .</b>	305
Yuanqing Li, Kai Keng Ang, and Cuntai Guan	
<b>Adaptive Methods in BCI Research - An Introductory Tutorial . . . . .</b>	331
Alois Schlögl, Carmen Vidaurre, and Klaus-Robert Müller	
<b>Toward Ubiquitous BCIs . . . . .</b>	357
Brendan Z. Allison	
<b>Index . . . . .</b>	389