

Contents

State of the Art in BCI Research: BCI Award 2011	1
Christoph Guger, Brendan Allison and Günter Edlinger	
An Auditory Output Brain–Computer Interface for Speech Communication	7
Jonathan S. Brumberg, Frank H. Guenther and Philip R. Kennedy	
User-Appropriate and Robust Control Strategies to Enhance Brain–Computer Interface Performance and Usability	15
E. V. C. Friedrich, R. Scherer and C. Neuper	
What’s Your Next Move? Detecting Movement Intention for Stroke Rehabilitation	23
R. Zimmermann, L. Marchal-Crespo, O. Lamercy, M.-C. Fluet, J.-C. Metzger, J. Edelmann, J. Brand, K. Eng, R. Riener, M. Wolf and R. Gassert	
A Review of Performance Variations in SMR-Based Brain–Computer Interfaces (BCIs).	39
Moritz Grosse-Wentrup and Bernhard Schölkopf	
Exploring the Cortical Dynamics of Learning by Leveraging BCI Paradigms	53
Tim Blakely, Kai Miller, Jeffrey Ojemann and Rajesh Rao	
An Affective BCI Using Multiple ERP Components Associated to Facial Emotion Processing.	61
Qibin Zhao, Yu Zhang, Akinari Onishi and Andrzej Cichocki	
Seven Degree of Freedom Cortical Control of a Robotic Arm.	73
Samuel T. Clanton, Angus JC McMorland, Zohny Zohny, S Morgan Jeffries, Robert G Rasmussen, Sharlene N Flesher and Meel Velliste	

**Utilizing High Gamma (HG) Band Power Changes as a Control
Signal for Non-Invasive BCI** 83
M. Smith, K. Weaver, T. Grabowski and F. Darvas

Towards a Speech BCI Using ECoG 93
Eric C. Leuthardt, John Cunningham and Dennis Barbour

**Towards Communication in the Completely Locked-In State:
Neuroelectric Semantic Conditioning BCI** 111
Daniele De Massari, Carolin A. Ruf, Adrian Furdea, Sebastian Halder,
Tamara Matuz and Niels Birbaumer

Conclusion 119