

# Contents – Part I

Automated Diagnosis of Alzheimer’s Disease by Integrating Genetic Biomarkers and Tissue Density Information . . . . .	1
<i>Andrés Ortiz, Miguel Moreno-Estévez, Juan M. Górriz, Javier Ramírez, María J. García-Tarifa, Jorge Munilla, and Nuria Haba</i>	
A Neural Model of Number Interval Position Effect (NIPE) in Children . . . . .	9
<i>Michela Ponticorvo, Francesca Rotondaro, Fabrizio Doricchi, and Orazio Miglino</i>	
A Volumetric Radial LBP Projection of MRI Brain Images for the Diagnosis of Alzheimer’s Disease . . . . .	19
<i>F.J. Martínez-Murcia, Andrés Ortiz, J.M. Górriz, J. Ramírez, and I.A. Illán</i>	
Telemetry System for Cochlear Implant Using ASK Modulation and FPGAs . . . . .	29
<i>Ernesto A. Martínez-Rams, Vicente Garcerán-Hernández, and Duarte Juan Sánchez</i>	
MBMEDA: An Application of Estimation of Distribution Algorithms to the Problem of Finding Biological Motifs . . . . .	39
<i>Carlos I. Jordán and Carlos. J. Jordán</i>	
Towards a Generic Simulation Tool of Retina Models . . . . .	47
<i>Pablo Martínez-Cañada, Christian Morillas, Begoña Pino, and Francisco Pelayo</i>	
Specialist Neurons in Feature Extraction Are Responsible for Pattern Recognition Process in Insect Olfaction . . . . .	58
<i>Aaron Montero, Ramon Huerta, and Francisco B. Rodriguez</i>	
Intensity Normalization of <sup>123</sup> I-ioflupane-SPECT Brain Images Using a Model-Based Multivariate Linear Regression Approach . . . . .	68
<i>A. Brahim, J. Manuel Górriz, Javier Ramírez, and L. Khedher</i>	
Independent Component Analysis-Based Classification of Alzheimer’s Disease from Segmented MRI Data . . . . .	78
<i>L. Khedher, Javier Ramírez, J. Manuel Górriz, A. Brahim, and I.A. Illán</i>	

Trajectories-State: A New Neural Mechanism to Interpretate Cerebral Dynamics . . . . .	88
<i>Sergio Miguel-Tomé</i>	
Global and Local Features for Char Image Classification . . . . .	98
<i>Deisy Chaves, Maria Trujillo, and Juan Barraza</i>	
On the Automatic Tuning of a Retina Model by Using a Multi-objective Optimization Genetic Algorithm . . . . .	108
<i>Rubén Crespo-Cano, Antonio Martínez-Álvarez, Ariadna Díaz-Tahoces, Sergio Cuenca-Asensi, J.M. Ferrández-Vicente, and Eduardo Fernández</i>	
Creating Robots with Personality: The Effect of Personality on Social Intelligence . . . . .	119
<i>Alexandros Mileounis, Raymond H. Cuijpers, and Emilia I. Barakova</i>	
Artificial Metaplasticity: Application to MIT-BIH Arrhythmias Database . . . . .	133
<i>Santiago Torres-Alegre, Juan Fombellida, Juan Antonio Piñuela-Izquierdo, and Diego Andina</i>	
Toward an Upper-Limb Neurorehabilitation Platform Based on FES-Assisted Bilateral Movement: Decoding User’s Intentionality . . . . .	143
<i>Andrés F. Ruiz Olaya, Alberto López-Delis, and Alexander Cerquera</i>	
Decoding of Imaginary Motor Movements of Fists Applying Spatial Filtering in a BCI Simulated Application . . . . .	153
<i>Jan Boelts, Alexander Cerquera, and Andrés F. Ruiz Olaya</i>	
The Koniocortex-Like Network: A New Biologically Plausible Unsupervised Neural Network . . . . .	163
<i>Francisco Javier Ropero Peláez and Diego Andina</i>	
Towards an Integrated Semantic Framework for Neurological Multidimensional Data Analysis . . . . .	175
<i>Santiago Timón Reina, Mariano Rincón Zamorano, and Atle Bjørnerud</i>	
Some Results on Dynamic Causal Modeling of Auditory Hallucinations . . . . .	185
<i>Leire Ozaeta, Darya Chyzyk, and Manuel Graña</i>	
Retinal DOG Filters: High-pass or High-frequency Enhancing Filters? . . . . .	195
<i>Adrián Arias, Eduardo Sánchez, and Luis Martínez</i>	

Spatio-temporal Dynamics of Images with Emotional Bivalence . . . . .	203
<i>M.D. Grima Murcia, M.A. Lopez-Gordo, Maria J. Ortíz, J.M. Ferrández-Vicente, and Eduardo Fernández</i>	
Interstimulus Interval Affects Population Response in Visual Cortex <i>in vivo</i> . . . . .	213
<i>Javier Alegre-Cortés, Eduardo Fernández, and Cristina Soto-Sánchez</i>	
Towards the Reconstruction of Moving Images by Populations of Retinal Ganglion Cells . . . . .	220
<i>Ariadna Díaz-Tahoces, Antonio Martínez-Álvarez, Alejandro García-Moll, Lawrence Humphreys, José Ángel Bolea, and Eduardo Fernández</i>	
FPGA Translation of Functional Hippocampal Cultures Structures Using Cellular Neural Networks . . . . .	228
<i>Victor Lorente, J. Javier Martínez-Álvarez, J.M. Ferrández-Vicente, Javier Garrigós, Eduardo Fernández, and Javier Toledo</i>	
Parkinson’s Disease Monitoring from Phonation Biomechanics . . . . .	238
<i>P. Gómez-Vilda, M.C. Vicente-Torcal, J.M. Ferrández-Vicente, A. Álvarez-Marquina, V. Rodellar-Biarge, V. Nieto-Lluis, and R. Martínez-Olalla</i>	
Retinal DOG Filters: Effects of the Discretization Process . . . . .	249
<i>Adrián Arias, Eduardo Sánchez, and Luis Martínez</i>	
Computable Representation of Antimicrobial Recommendations Using Clinical Rules: A Clinical Information Systems Perspective . . . . .	258
<i>Natalia Iglesias, Jose M. Juarez, Manuel Campos, and Francisco Palacios</i>	
Abstracting Classification Models Heterogeneity to Build Clinical Group Diagnosis Support Systems . . . . .	269
<i>Oscar Marin-Alonso, Daniel Ruiz-Fernández, and Antonio Soriano-Paya</i>	
Using EEG Signals to Detect the Intention of Walking Initiation and Stop . . . . .	278
<i>Enrique Hortal, Andrés Úbeda, Eduardo Iáñez, Eduardo Fernández, and Jose M. Azorín</i>	
Low-cost Remote Monitoring of Biomedical Signals . . . . .	288
<i>J.M. Morales, C. Díaz-Piedra, L.L. Di Stasi, Pablo Martínez-Cañada, and S. Romero</i>	
Asynchronous EEG/ERP Acquisition for EEG Teleservices . . . . .	296
<i>M.A. Lopez-Gordo, Pablo Padilla, F. Pelayo Valle, and Eduardo Fernandez</i>	

A Machine Learning Approach to Prediction of Exacerbations of Chronic Obstructive Pulmonary Disease . . . . .	305
<i>Miguel Angel Fernandez-Granero, Daniel Sanchez-Morillo, Miguel Angel Lopez-Gordo, and Antonio Leon</i>	
Brain-Computer Interfacing to Heuristic Search: First Results . . . . .	312
<i>Marc Cavazza, Gabor Aranyi, and Fred Charles</i>	
English Phonetics: A Learning Approach Based on EEG Feedback Analysis . . . . .	322
<i>Luz García Martínez, Alejandro Álvarez Pérez, Carmen Benítez Ortúzar, Pedro Macizo Soria, and Teresa Bajo Molina</i>	
Dynamic Modelling of the Whole Heart Based on a Frequency Formulation and Implementation of Parametric Deformable Models . . . .	330
<i>Rafael Berenguer-Vidal, Rafael Verdú-Monedero, and Álar-Ginés Legaz-Aparicio</i>	
Multimodal 3D Registration of Anatomic (MRI) and Functional (fMRI and PET) Intra-patient Images of the Brain . . . . .	340
<i>Álar-Ginés Legaz-Aparicio, Rafael Verdú-Monedero, Jorge Larrey-Ruiz, Fernando López-Mir, Valery Naranjo, and Ángela Bernabéu</i>	
Localisation of Pollen Grains in Digitised Real Daily Airborne Samples . . . . .	348
<i>Estela Díaz-López, M. Rincón, J. Rojo, C. Vaquero, A. Rapp, S. Salmeron-Majadas, and R. Pérez-Badia</i>	
Estimation of the Arterial Diameter in Ultrasound Images of the Common Carotid Artery . . . . .	358
<i>Rosa-María Menchón-Lara, Andrés Bueno-Crespo, and José Luis Sancho-Gómez</i>	
Comparison of Free Distribution Software for EEG Focal Epileptic Source Localization . . . . .	368
<i>Alexander Ossa, Camilo Borrego, Mario Trujillo, and Jose D. Lopez</i>	
Weighted Filtering for Neural Activity Reconstruction Under Time Varying Constraints . . . . .	377
<i>J.I. Padilla-Buritica, E. Giraldo-Suárez, and G. Castellanos-Domínguez</i>	
Neural Activity Estimation from EEG Using an Iterative Dynamic Inverse Problem Solution . . . . .	388
<i>E. Giraldo-Suárez and G. Castellanos-Domínguez</i>	

Supervised Brain Tissue Segmentation Using a Spatially Enhanced Similarity Metric . . . . .	398
<i>D. Cárdenas-Peña, M. Orbes-Arteaga, and G. Castellanos-Domínguez</i>	
iLU Preconditioning of the Anisotropic-Finite-Difference Based Solution for the EEG Forward Problem . . . . .	408
<i>E. Cuartas-Morales, C. Daniel-Acosta, and G. Castellanos-Domínguez</i>	
EEG Rhythm Extraction Based on Relevance Analysis and Customized Wavelet Transform . . . . .	419
<i>L. Duque-Muñoz, R.D. Pinzon-Morales, and G. Castellanos-Domínguez</i>	
Estimation of M/EEG Non-stationary Brain Activity Using Spatio-temporal Sparse Constraints . . . . .	429
<i>J.D. Martínez-Vargas, F.M. Grisales-Franco, and G. Castellanos-Domínguez</i>	
Connectivity Analysis of Motor Imagery Paradigm Using Short-Time Features and Kernel Similarities . . . . .	439
<i>L.F. Velasquez-Martinez, A.M. Alvarez-Meza, and G. Castellanos-Domínguez</i>	
Robust Linear Longitudinal Feedback Control of a Flapping Wing Micro Air Vehicle . . . . .	449
<i>Lidia María Belmonte, R. Morales, Antonio Fernández-Caballero, and José A. Somolinos</i>	
Use and Adoption of a Touch-Based Occupational Therapy Tool for People Suffering from Dementia . . . . .	459
<i>René F. Navarro, Marcela D. Rodríguez, and Jesús Favela</i>	
Multisensory Treatment of the Hemispatial Neglect by Means of Virtual Reality and Haptic Techniques . . . . .	469
<i>Miguel A. Teruel, Miguel Oliver, Francisco Montero, Elena Navarro, and Pascual González</i>	
Evaluation of Color Preference for Emotion Regulation . . . . .	479
<i>Marina V. Sokolova, Antonio Fernández-Caballero, Laura Ros, José Miguel Latorre, and Juan Pedro Serrano</i>	
Elicitation of Emotions through Music: The Influence of Note Value . . . .	488
<i>Alicia Fernández-Sotos, Antonio Fernández-Caballero, and José Miguel Latorre</i>	
Towards Emotionally Sensitive Conversational Interfaces for E-therapy . . . . .	498
<i>David Griol, José Manuel Molina, and Zoraida Callejas</i>	

Automatic Drawing Analysis of Figures Included in Neuropsychological Tests for the Assessment and Diagnosis of Mild Cognitive Impairment . . . . .	508
<i>M. Rincón, S. García-Herranz, M.C. Díaz-Mardomingo, R. Martínez-Tomás, and H. Peraita</i>	
Identification of Loitering Human Behaviour in Video Surveillance Environments . . . . .	516
<i>Héctor F. Gómez A., Rafael Martínez Tomás, Susana Arias Tapia, Antonio Fernández Caballero, Sylvie Ratté, Alexandra González Eras, and Patricia Ludeña González</i>	
Stress Detection Using Wearable Physiological Sensors . . . . .	526
<i>Virginia Sandulescu, Sally Andrews, David Ellis, Nicola Bellotto, and Oscar Martínez Mozos</i>	
An Embedded Ground Change Detector for a “Smart Walker” . . . . .	533
<i>Viviana Weiss, Aleksandr Korolev, Guido Bologna, Séverine Cloix, and Thierry Pun</i>	
<b>Author Index</b> . . . . .	543

Artificial Computation in Biology and Medicine  
International Work-Conference on the Interplay  
Between Natural and Artificial Computation, IWINAC  
2015, Elche, Spain, June 1-5, 2015, Proceedings, Part I  
Ferrández Vicente, J.M.; Álvarez-Sánchez, J.R.; de la Paz  
López, F.; Toledo-Moreo, F.J.; Adeli, H. (Eds.)  
2015, XXIV, 546 p. 224 illus., Softcover  
ISBN: 978-3-319-18913-0