

PROCEEDINGS OF SPIE

12th International Symposium on Medical Information Processing and Analysis

**Eduardo Romero
Natasha Lepore
Jorge Brieva
Ignacio Larrabide**
Editors

**5–7 December 2016
Tandil, Argentina**

Organized by

SIPAİM Foundation (International Society) • Universidad Nacional del Centro de la Provincia de Buenos Aires - UNICEN (Argentina) • Universidad Nacional de Colombia • Universidad Panamericana (Mexico)

Sponsored by

SIPAİM Foundation (International Society) • Ministerio de Ciencia, Tecnología e Innovación Productiva - MinCyT (Argentina) • Universidad Nacional del Centro de la Provincia de Buenos Aires - UNICEN (Argentina) • Universidad Nacional de Colombia (Colombia) • Universidad Panamericana (Mexico) • Comisión de Investigaciones Científicas - Provincia de Buenos Aires - CIC (Argentina) • Consejo Nacional de Investigaciones Científicas y Técnicas de Argentina (Argentina)

Published by
SPIE

Volume 10160

Proceedings of SPIE 0277-786X, V. 10160

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

12th International Symposium on Medical Information Processing and Analysis, edited by Eduardo Romero, Natasha Lepore, Jorge Brieva, Ignacio Larrabide, Proc. of SPIE Vol. 10160, 1016001
© 2017 SPIE · CCC code: 0277-786X/17/\$18 · doi: 10.1117/12.2271156

Proc. of SPIE Vol. 10160 1016001-1

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings:

Author(s), "Title of Paper," in *12th International Symposium on Medical Information Processing and Analysis*, edited by Eduardo Romero, Natasha Lepore, Jorge Brieva, Ignacio Larrabide, Proceedings of SPIE Vol. 10160 (SPIE, Bellingham, WA, 2017) Seven-digit Article CID Number.

ISSN: 0277-786X
ISSN: 1996-786X (electronic)

ISBN: 9781510607781
ISBN: 9781510607798 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445
SPIE.org

Copyright © 2017, Society of Photo-Optical Instrumentation Engineers.

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 0277-786X/17/\$18.00.

Printed in the United States of America.

Publication of record for individual papers is online in the SPIE Digital Library.

**SPIE. DIGITAL
LIBRARY**

SPIDigitalLibrary.org

Paper Numbering: *Proceedings of SPIE* follow an e-First publication model. A unique citation identifier (CID) number is assigned to each article at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

Contents

vii	<i>Authors</i>
xi	<i>Conference Committees</i>
xv	<i>Introduction</i>

BIOSIGNAL

10160 02	Open access database of EEG signals recorded during imagined speech [10160-4]
10160 03	Transfer entropy to characterize brain-heart topology in sleep apnea patients treated with continuous positive airway pressure [10160-30]
10160 04	Detection of non-homogeneous cycles in blood flow signals in coronary grafts [10160-22]
10160 05	Granger causality suggests an association between heart rate variability and EEG band power dynamics [10160-55]

ULTRASOUND

10160 06	Fetal biometric measurements during the first trimester of pregnancy [10160-44]
10160 07	Segmentation of the nuchal fold in fetal ultrasound images [10160-50]
10160 08	Ultrasound fetal brain registration using weighted coherent point drift [10160-9]
10160 09	Comparison of real-time ultrasound simulation models using abdominal CT images [10160-6]

BRAIN - STRUCTURE

10160 0A	Multivariate surface-based analysis of corpus callosum in patients with sickle cell disease [10160-87]
10160 0B	The changing brain in healthy aging: a multi-MRI machine and multicenter surface-based morphometry study [10160-43]
10160 0C	The core genetic network underlying sulcal morphometry [10160-65]
10160 0D	Hippocampal segmentation using mean shift algorithm [10160-25]
10160 0E	Putamen development in children 12 to 21 months old [10160-78]

MAN MACHINE INTERFACE

- 10160 OF **Classifiers' comparison for P300 detection in a modified speller screen** [10160-61]
- 10160 OG **Multiple motion gaming devices-based balance evaluation platform** [10160-3]
- 10160 OH **Quantifying the gait pattern adaptation to auditory feedback in healthy elder adults** [10160-58]

METHODS

- 10160 OI **Development of methods for deconvolution algorithms performance analysis using FIJI and Icy plugins** [10160-12]
- 10160 OJ **Fast Fourier transform-based analysis of renal masses on contrast-enhanced computed tomography images for grading of tumor** [10160-35]
- 10160 OK **Ray-casting method to assess the quality of segmented surfaces from 3D images** [10160-20]
- 10160 OL **Video motion magnification for monitoring of vital signals using a perceptual model** [10160-68]
- 10160 OM **Cortical connectome registration using spherical demons** [10160-71]

DIGITAL PATHOLOGY

- 10160 ON **Pigmented skin lesion segmentation based on sparse texture representations** [10160-42]
- 10160 OO **Microscope cell color images segmentation by fuzzy morphological reconstruction** [10160-51]
- 10160 OP **Color separation of H&E stained samples by linearly projecting the RGB representation onto a custom discriminant surface** [10160-67]
- 10160 OQ **Nuclei graph local features for basal cell carcinoma classification in whole slide images** [10160-86]

E-HEALTH, DIABETES, AND GLAUCOMA

- 10160 OR **Geometric adaptive control in type 1 diabetes** [10160-17]
- 10160 OS **Anthropometric index for insulin sensitivity assessment in older adults from Ecuadorian highlands** [10160-77]
- 10160 OT **Convolutional network to detect exudates in eye fundus images of diabetic subjects** [10160-56]

10160 0U **Convolutional neural network transfer for automated glaucoma identification** [10160-5]

BRAIN - BEHAVIORAL DISORDERS

10160 0V **Variable clustering reveals associations between subcortical brain volume and cognitive changes in pediatric traumatic brain injury** [10160-72]

10160 0W **Utilizing brain measures for large-scale classification of autism applying EPIC** [10160-34]

10160 0X **A multidimensional feature space for automatic classification of autism spectrum disorders (ASD)** [10160-64]

10160 0Y **Large-scale classification of major depressive disorder via distributed Lasso** [10160-53]

10160 0Z **Exploring Alzheimer's anatomical patterns through convolutional networks** [10160-31]

CARDIOVASCULAR SYSTEM

10160 10 **3D optical flow estimation in cardiac CT images using the Hermite transform** [10160-21]

10160 11 **Identification of border-zone corridors in the left ventricle using the core expansion method** [10160-10]

10160 12 **Detection of morphological structures for vessel wall segmentation in IVUS using random forests** [10160-7]

10160 13 **Low-cost phantoms for validating measurements in ultrasound vascular images** [10160-8]

10160 14 **Real-time vascular response assessment by means of a dual pressure-diameter device: a preliminary study** [10160-76]

LARGE-SCALE DATA INTERACTIONS

10160 15 **Extending PACS functionality: towards facilitating the conversion of clinical necessities into research-derived applications** [10160-90]

10160 16 **Secure multivariate large-scale multi-centric analysis through on-line learning: an imaging genetics case study** [10160-23]

10160 17 **Radiomics-based quantitative biomarker discovery: development of a robust image processing infrastructure** [10160-28]

10160 18 **A radiology image retrieval system based on user preferences** [10160-85]

BRAIN CONNECTOMICS

10160 19 **Tract-based spectroscopy to investigate pediatric brain trauma** [10160-38]

- 10160 1A **Clustering white matter fibers using support vector machines: a volumetric conformal mapping approach** [10160-70]
- 10160 1B **Improvement of co-occurrence matrix calculation and collagen fibers orientation estimation** [10160-18]

DATA SIMULATION AND MODELLING

- 10160 1C **Porosity distribution upon the surface of a deployed flow diverter: an experimental and simulation study** [10160-19]
- 10160 1D **Changes on abdominal aortic fluid dynamics after implantation of grafts based on endovascular aneurysm sealing system (EVAS)** [10160-41]
- 10160 1E **Hierarchical eigenmodes to characterize bladder motion and deformation in prostate cancer radiotherapy** [10160-46]
- 10160 1F **Flow diverter stents simulation with CFD: porous media modelling** [10160-16]
- 10160 1G **A comparative study between parallel and normal excitation for crawling wave sonoelastography** [10160-27]

BRAIN - SIGNAL PROCESSING

- 10160 1H **Automatic detection of perturbed magnetic resonance signal** [10160-26]
- 10160 1I **Algorithm for the identification of resting state independent networks in fMRI** [10160-45]
- 10160 1J **Bayesian super-resolution in brain diffusion weighted magnetic resonance imaging (DW-MRI)** [10160-48]
- 10160 1K **Improved clinical diffusion MRI reliability using a tensor distribution function compared to a single tensor** [10160-79]
- 10160 1L **Leveraging sparsity to detect HRF variability in fMRI** [10160-59]

ADDITIONAL PAPER

- 10160 1M **Visual mismatch negativity (vMMN): automatic detection change followed by an inhibition of the attentional switch without visual awareness (Invited Paper)** [10160-91]

Authors

Numbers in the index correspond to the last two digits of the seven-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first five digits reflect the volume number. Base 36 numbering is employed for the last two digits and indicates the order of articles within the volume. Numbers start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B...0Z, followed by 10-1Z, 20-2Z, etc.

Acosta, J., 11
Acosta, Oscar, 1E
Adur, Javier F., 0I, 1B
Albornoz, Enrique M., 0N
Alexander, Daniel C., 16
Alger, Jeffry R., 19
Almeida, Javier, 0X
Alsac, Jean-Marc, 1D
Altmann, Andre, 16
Amorena, C., 0R
Arámbula Cosío, Fernando, 07, 08
Arevalo, John, 0T
Arias, Viviana, 0Q
Armentano, R. L., 14
Aron, Manju, 0J
Asarnow, Robert F., 0V, 19
Atehortúa, Angélica, 0H
Auzias, Guillaume, 0C
Babbitt, Christopher, 0V, 19
Babikian, Talin, 0V, 19
Ballarin, Virginia L., 0O
Berruezo, A., 11
Blaschko, Matthew B., 0U
Bluml, Stefan, 15
Bojorges-Valdez, Erik, 05, 06
Boroni, Gustavo, 1F
Bouchet, Agustina, 0O
Bracamontes Piña, María Georgina, 06
Brieva, Jorge, 04, 0L, 10
Brun, Marcel, 0O
Calvo, M., 09
Camargo Marín, Lisbeth, 06, 07, 08
Casciaro, Mariano E., 1D
Casco, Víctor H., 0I, 1B
Castañeda, Benjamin, 1G
Celis A., Juan S., 1J
Celis, Raul, 0P
Cen, Steven Y., 0J, 17
Cerquera, Alexander, 03
Chai, Yaqiong, 0A
Chang, Michael, 0J, 17
Chen, Frank, 0J
Clausse, Alejandro, 1F
Cocha, G. R., 0R
Commandeur, Frederic, 1E
Corredor, Germán, 0Q, 18
Craiem, Damian, 1D
Curto, Anna, 1C
Cymberknop, L. J., 14
D'Amato, J. P., 09, 0K
Dannlowksi, Udo, 0Y
D'Attellis, C., 0R
Dazeo, Nicols, 1F
Dean, Douglas, 0E
de Crevoisier, Renaud, 1E
De la Cruz-Armenta, Victoria, 05
Del Fresno, Mariana, 0K, 0U, 12, 13
De Luca, M. A., 14
Deng, Christopher, 0J, 17
Dennis, Emily L., 0V, 19
Deoni, Sean, 0E
Desai, Bhushan B., 0J
Desai, Mihir, 0J
Díaz, Alejandro, 13
Ding, Andreas, 1C
Dirks, Holly, 0E
Donnelly Kehoe, Patricio, 0B, 11
Dorado, Paula Andrea, 0P
Dottori, Javier, 1D, 1F
Douglas, P.K., 1L
Duddalwar, Vinay A., 0J, 17
El-Batti, Salma, 1D
Encalada, L., 0S
Erberich, Stephan, 15
Erbes, Luciana A., 0I, 1B
Escalante-Ramírez, Boris, 07, 10
Espinosa, Jairo, 1E
Faskowitz, Joshua I., 0C, 0M, 0W
Fernandez Vera, E., 09
Fernandez, Hector, 1C
Fernández-Armenta, J., 11
Figueras i Ventura, R. M., 11
Freund, Jan A., 03
Gajawelli, Niharika, 0E
Garcia Bauza, C., 0K
García-Arteaga, Juan D., 0Q
Gareis, Iván E., 02
Gill, Inderbir, 0J
Giza, Christopher C., 0V, 19
Gomez, Juan Carlos, 0B, 11
Gomez-Coronel, Sandra L., 0L
Gonzalez, Eduardo A., 1G
González, Fabio A., 0T
Gotlib, Ian H., 0Y
Grotegerd, Dominik, 0Y
Gupta, Vikash, 1A
Gutierrez, Benjamin, 08
Gutman, Boris A., 0M, 16

Guzmán, Didier T., 04
 Guzmán, Lina M., 18
 Guzmán Huerta, Mario, 06, 07, 08
 Hadid, Vanessa, 1M
 Harrison, Marc B., 0W
 Herrera, H., 0S
 Hibar, Derrek P., 0Y
 Hwang, Darryl H., 0J, 17
 Iregui, Marcela, 0H
 Isaev, Dmitry Y., 0M, 1K
 Jahanshad, Neda, 0C, 0W, 0Y, 1K
 Ji, Chaoran, 0A
 Jiménez Alaniz, Juan Ramón, 0D
 Johnson, Jeffrey L., 0V, 19
 Juliá-Serdá, Gabriel, 03
 Kim, Dongho, 0G
 Kochunov, Peter, 0C
 Kwon, Mike, 0J
 Lafond, Caroline, 1E
 Lao, Yi, 0A, 0E
 Larrabide, Ignacio, 09, 12, 13, 1C, 1D, 1F
 Larrabide, J., 09
 Lavarello, Roberto, 1G
 Lee, Eun-Young, 0G
 Leow, Alex D., 1K
 Lepore, Franco, 1M
 Lepore, Natasha, 0A, 0E, 15
 Li, Qingyang, 0Y
 Li, Yicen, 0A
 Liang, Gangning, 0J
 Lo Vercio, Lucas, 12, 13
 López Palafox, Guadalupe Desirée, 0D
 Lorenzi, Marco, 16
 Manterola, Hugo Luis, 13
 Marrufo Melendez, Oscar, 0D
 Martínez, César E., 0N
 Mateus, Diana, 08
 Mazzadi, A., 0R
 McComb, J. Gordon, 15
 Medina Bañuelos, Verónica, 06, 07, 08
 Melamed, Edward, 15
 Mink, Richard, 0V, 19
 Mira, Carlos, 10
 Morales Ballesteros, Orlando, 0D
 Moya-Albor, Ernesto, 0L, 10
 Moyer, Daniel, 0M
 Nagel, Jorge, 0B, 11
 Navab, Nassir, 08
 Nelson, Marvin D., 0E, 15
 Nir, Talia M., 1K
 O'Muircheartaigh, Jonathan, 0E
 O'Neil, Sharon, 0A
 Orjuela-Cañón, Alvaro, 03
 Orlando, José Ignacio, 0U
 Ortiz-Suárez, Juan M., 0Z
 Ourselin, Sebastien, 16
 Paladini, Giustino, 15
 Pardini, Pamela Alejandra, 13
 Pascariello, G., 0B
 Pastore, Juan I., 0O
 Penela, D., 11
 Perdomo, Oscar, 0T
 Pérez González, Jorge Luis, 08, 0D
 Pérez López, N., 14
 Piña-Ramírez, Omar, 0F
 Pineda, Gustavo, 0H
 Pizzagalli, Fabrizio, 0C
 Planes, X., 11
 Ponce, Hiram, 0L
 Prasad, Gautam, 0W, 1A
 Pressel Coretto, Germán A., 02
 Prokofyeva, Elena, 0U
 Quaglino, M., 0B
 Ramos-Pollán, Raúl, 0Z
 Rashid, Faisal, 19
 Ravelo-García, Antonio, 03
 Riedel, Brandalyn C., 0W, 0Y
 Rios, Richard, 1E
 Roa-Huertas, Jessica, 03
 Romero C., Eduardo, 0H, 0P, 0Q, 0X,
 0Z, 18, 1H, 1J
 Romero, Stefano E., 1G
 Romo-Bucheli, David, 0Q
 Rubi, P., 09
 Rufiner, H. Leonardo, 02
 Sacchet, Matthew D., 0Y
 Salguero, Jennifer, 1H
 Sánchez Rivera, Moisés, 06
 Schmaal, Lianne, 0Y
 Serra, Luis, 11, 1C
 Severeyn, E., 0S
 Sivori, G., 14
 Son, Jonghee, 0G
 Song, Min, 15
 Sosa Orfíz, Ana Luisa, 0D
 Steghöfer, M., 11
 Thompson, Paul M., 0C, 0M, 0V, 0W, 0Y, 16,
 19, 1A, 1J, 1K
 Ugweze, Chidubem, 0J, 17
 Valdés-Cristerna, Raquel, 0F
 Vallejo Venegas, Enrique, 10
 Varghese, Bino A., 0J, 17
 Veer, Ilya M., 0Y
 Velasco T., Nelson F., 0X, 1H, 1J
 Velásquez, Gustavo, 07
 Velásquez, J., 0S
 Veltman, Dick J., 0Y
 Vénere, M., 0K
 Ver Steeg, Greg, 0V
 Villalon-Reina, Julio E., 19, 1J, 1K
 Vlasova, Roza, 0E
 Waks Serra, María Victoria, 13
 Walter, Henrik, 0Y
 Wang, Yalin, 0A, 0E
 Wihardja, Frisca, 15
 Wong, S., 0S
 Wood, John, 0A
 Yanez-Suarez, Oscar, 05, 0F
 Yap, Felix Y., 0J
 Ye, Jieping, 0Y

Yepes-Calderon, Fernando, 15
Yoon, James, 0E
Zavaliangos-Petropulu, Artemis, 0V
Zeitoune, Ángel A., 0I, 1B
Zhan, Liang, 1K
Zhu, Dajiang, 0Y

Conference Committees

Conference Chairs

Eduardo Romero, University Nacional de Colombia (Colombia)
Natasha Lepore, Children's Hospital Los Angeles (United States)
Jorge Brieva, Universidad Panamericana (Mexico)
Ignacio Larrabide, Instituto PLADEMA, CONICET, UNICEN (Argentina)

Organizing Committee

Eduardo Romero, Universidad Nacional de Colombia (Colombia)
Natasha Lepore, The University of Southern California (United States)
Ignacio Larrabide, UNICEN (Argentina)
Juan D'Amato, UNICEN (Argentina)
Juan David García, Universidad Nacional de Colombia (Colombia)
Angel Cruz Roa, Universidad de los Llanos (Colombia)
Pablo Rinaldi, UNICEN (Argentina)
Gustavo Boroni, UNICEN (Argentina)
Virginia Cifuentes, UNICEN (Argentina)

Program Committee

Eduardo Romero, Universidad Nacional de Colombia (Colombia)
Ignacio Larrabide, Instituto PLADEMA, CONICET, UNICEN (Argentina)
Juan D'Amato, UNICEN (Argentina)
Lucas Daniel Lo Vercio, UNICEN (Argentina)

Reviewers

Eduardo Romero, Universidad Nacional de Colombia (Colombia)
Jorge Brieva, Universidad Panamericana (Mexico)
Ignacio Larrabide, Instituto PLADEMA, CONICET, UNICEN (Argentina)
Juan D'Amato, UNICEN (Argentina)
Juan David García, Universidad Nacional de Colombia (Colombia)
Andrea Rueda, Pontificia Universidad Javeriana (Colombia)
Olivier Lézoray, Université de Caen Basse-Normandie (France)
Sara Wong, Universidad Simón Bolívar (Venezuela)
Fabio Martínez, Universidad Industrial de Santander (Colombia)
Félix Martínez, Universidad Panamericana (Mexico)
Javier Adur, Universidad Nacional de Entre Ríos (Argentina)
Daniel Racoceanu, Pontificia Universidad Católica del Perú (Peru)
Ricardo Gutiérrez, Universidad EAFIT (Colombia)
Katya Rodríguez, IIMAS, Universidad Nacional Autónoma de México (Mexico)

Emanuele Schiavi, Universidad Rey Juan Carlos (Spain)
Ernesto Moya-Albor, Universidad Panamericana (Mexico)
Nidiyare Hevia-Montiel, Universidad Nacional Autónoma de México (Mexico)
Diego Gómez, Universidad Antonio Nariño (Colombia)
Gloria Díaz, Instituto Tecnológico Metropolitano (Colombia)
Alexander Cerquera, Universidad Antonio Nariño (Colombia)
Olivier Salvado, Commonwealth Scientific and Industrial Research Organisation (Australia)
María Zuluaga, University College London (United Kingdom)
Antoine Manzanera, ENSTA-ParisTech (France)
Leonardo Valencia, Pontificia Universidad Javeriana (Colombia)
Juan Jiménez, Universidad Autónoma Metropolitana (Mexico)
Quentin Noirhomme, Maastricht University (Netherlands)
Alfredo Hernandez, INSERM (France)
Germán Castellanos Domínguez, Universidad Nacional de Colombia (Colombia)
Alexandra La Cruz, Universidad Simón Bolívar (Venezuela)
Francisco Gómez, Universidad Nacional de Colombia (Colombia)
Norberto Malpica, Universidad Rey Juan Carlos (Spain)
Gianfranco Passariello, Universidad Simón Bolívar (Venezuela)
Crescencio Garcia, Universidad Nacional Autónoma de México (Mexico)
Raul Ramos, Universidad Industrial de Santander (Colombia)
Javier Pascou, Universidad Carlos III de Madrid (Spain)
Luis Rodríguez, Escuela Colombiana de Ingeniería Julio Garavito (Colombia)
Fabio González, Universidad Nacional de Colombia (Colombia)
Fernando Arámbula Cosío, Universidad Nacional Autónoma de México (Mexico)
Maira García, Universidad EAN (Colombia)
Antonio José Bravo, Universidad Nacional Experimental del Táchira (Venezuela)
Jhimli Mitra, Case Western Reserve University (United States)
Angel Cruz, Universidad de los Llanos (Colombia)
Soumya Ghose, Case Western Reserve University (United States)
Alfredo Mantilla, Tecnológico de Monterrey (Mexico)
Cristina Santa Marta, Universidad Nacional de Educación a Distancia (Spain)
Oscar David Robles, Universidad Rey Juan Carlos (Spain)
Pablo Javier Blanco, Universidad Rey Juan Carlos (Spain)
Javier Dottori, UNICEN (Argentina)
Hrvoje Bogunović, Medical University of Vienna (Austria)
Rosana Barbuzza, UNICEN (Argentina)
Constantyn Butakoff, Universitat Pompeu Fabra (Spain)
Mariana del Fresno, UNICEN (Argentina)
Enzo Ferrante, Imperial College London (United Kingdom)

Rosa M. Figueras i Ventura, Hospital Clínic de Barcelona (Spain)
and Galgo Medical (Spain)
Alfredo Higuera Esteban, Hospital Clínic de Barcelona (Spain)
and Galgo Medical (Spain)
Gustavo Meschino, Universidad Nacional de Mar del Plata
(Argentina)
Fernando Yepes-Calderon, Children's Hospital Los Angeles
(United States)

Session Chairs

- 1 Biosignal
Petia Radeva, Universitat de Barcelona (Spain)
- 2 Ultrasound
Jose M. Massa, UNICEN (Argentina)
- 3 Brain - Structure
Olivier Coulon, CNRS (France)
- 4 Man Machine Interface
Cristian García Bauza, UNICEN (Argentina)
- 5 Methods
Pablo Rinaldi, UNICEN (Argentina)
- 6 Digital Pathology
Anant Madabhushi, Case Western Reserve University (United States)
- 7 E-Health, Diabetes and Glaucoma
Mariana del Fresno, UNICEN (Argentina)
- 8 Brain - Behavioral Disorders
Natasha Lepore, The University of Southern California (United States)
- 9 Cardiovascular Imaging
Ignacio Larrabide, Instituto PLADEMA, CONICET, UNICEN (Argentina)
- 10 Large Scale Data Interactions
Marius Linguraru, George Washington University (United States)
- 11 Brain Connectomics
Eduardo Romero, Universidad Nacional de Colombia (Colombia)

- 12 Data Simulation & Modelling
Jorge Brieva, Universidad Panamericana (Mexico)
- 13 Brain - Signal Processing
Juan D'Amato, UNICEN (Argentina)

Introduction

Welcome to conference proceedings from the 12th International Symposium on Medical Information Processing and Analysis - SIPAIM 2016!

SIPAIM 2016 was held, for the first time, in Tandil, Argentina. The symposium was organized by the Universidad Nacional del Centro de la Provincia de Buenos Aires (UNICEN). The organization had the support of the Comisión de Investigaciones Científicas y Tecnológicas de la Provincia de Buenos Aires (CICPBA), the Ministerio de Ciencia y Tecnología (MINCYT), Universidad Nacional del Centro de la Provincia de Buenos Aires (UNICEN), Comisión Nacional de Investigaciones Científicas y Tecnológicas (CONICET) and Pladema Institute (Universidad Nacional del Centro de la Provincia de Buenos Aires), Universidad Nacional de Colombia (UNAL), Universidad Panamericana (Mexico) and SIPAIM foundation.

Over the last couple of years, SIPAIM has evolved from a small meeting to an international symposium with participation of researchers from several countries across Latin America, North America, Europe and Asia. The collaboration with SPIE has brought growing attention to the event and has improved the quality and visibility of the proceedings. SIPAIM is mainly focused on gathering Latin American community on medical image analysis and information processing where researchers can participate in discussions about recent results, ongoing research and future projects in the areas and topics of the symposium. The symposium is also a great opportunity for networking among the members of this community. SIPAIM is addressed to researchers, students and professionals in a wide range of disciplines including Engineering, Physics, Mathematics, Computer Science, Biology and Health Sciences, and includes keynote lectures by recognized experts on issues related to acquisition, digitization, visualization, processing, analysis and interpretation of medical information. There are also several tutorials aimed at the complementary education of students concerning the topics of the conference.

We received 74 submissions, and after a very strict revision process, 56 papers were accepted for presentation. The conference included the participation of eight internationally recognized keynote and workshop speakers. The symposium included the following tracks: Medical and Biomedical Imaging, eHealth, Digital Pathology, Gait Analysis and Biosignals, Representation Based Biosignal Analysis, and Analysis of Medical Procedures through Imaging.

SIPAIM's venue was in the quiet and friendly city of Tandil, Argentina. Tandil is recognized as a strong technology development city in Argentina with the University as the city's beating heart. This young city (founded in 1823), is surrounded by hills and has a relaxed way of life treasured by tourists from the whole country and abroad. SIPAIM organizers hope that each and every one of this year's SIPAIM attendees had the chance to see this in Tandil, and that they had a nice and interesting time with its technical program. See you next year!

Eduardo Romero
Natasha Lepore
Jorge Brieva
Ignacio Larrabide