

- M1 Rosanna Degani Young Investigator Finals**
- 1-212 **Detecting Mechanical Alternans in the Photoplethysmography**
Tudor Besleaga*, Antonio Canichella, Nicola Toschi, Andreas Demosthenous, Pier Lambiase, Michele Orini
- 2-115 **Risk Assessment of All-Cause Mortality in Implanted Cardioverter Defibrillator Patients Using a Novel QRS Fragmentation Score**
Griet Goovaerts*, Sibasankar Padhy, Carolina Varon, Bert Vandenberg, Rik Willems, Sabine Van Huffel
- 3-94 **In Silico Safety Pharmacology on Intersubject Variability Population of Models: A Regression Model Approach**
Ana Maria Sanchez de la Nava*, Alejandro Liberos, Ismael Hernández-Romero, Maria de la Salud Guillem Sánchez, Felipe Atienza, Francisco Fernandez-Aviles, Andreu M. Climent
- 4-329 **Mathematical Modeling of Nonselective Channels: Estimating Ion Current Fractions and Their Impact on Pathological Simulations**
Eike Moritz Wülfers*, Peter Kohl, Gunnar Seemann

- S21 Novel Quantification Approaches from Cardiovascular Imaging**
- 5-41 **Evaluation of Left Ventricular Diastolic Function Using 4D Flow Magnetic Resonance Imaging**
Sophia Houriez--Gombaudo-Saintonge*, Emilie Bollache, Gilles Soulat, Youssef Alattar, Jérôme Lamy, Umit Gencer, Alban Redheuil, Elie Mousseaux, Yasmina Chenoune, Nadjia Kachenoura
- 6-260 **Development of a New Approach for the Assessment of Complex Blood Flow Patterns in the Left Atrium From 4D Flow MRI**
Enrico Soldati*, Thomas Dietenbeck, Alban Redheuil, Alessandro Masci, Sophia Houriez, Gombaudo Saintonge, Nadjia Kachenoura Kachenoura2, Cristiana Corsi
- 7-393 **Quantification of Left Atrium Fibrosis From Late Gadolinium Enhanced MRI in Atrial Fibrillation**
Alice Andalò*, Claudio Fabbri, Maddalena Valinoti, Alessandro Masci, Cristiana Corsi
- 8-278 **Automated Scar Segmentation From Cardiac Magnetic Resonance-Late Gadolinium Enhancement Images Using a Deep-Learning Approach**
Sara Moccia, Riccardo Banali, Chiara Martini, Giuseppe Muscogiuri, Gianluca Pontone, Mauro Pepi, Enrico Caiani*
- 9-218 **Semiautomatic Vendor Independent Software for Assessment of Local Arterial Stiffness**
Madalina Negoita, Shima Abdullateef*, Alessandro Giudici, Alun D Hughes, Kim H Parker, Ashraf W Khir
- 10-318 **Uncalibrated Real-Time Stroke Volume Estimation in MRI Using the Magnetohydrodynamic Effect ?**
Charles-Antoine Robert, Emilien Micard, Julien Oster*

S22 Special Session: Bioimpedance Monitoring

- 11-397 **Bioimpedance for Healthcare and Lifestyle Applications**
Willemijn Groenendaal*
- 12-398 **A Wearable Thoracic Impedance Sensor for Acutely
Decompensated Heart Failure Monitoring**
Christophe Smeets*
- 13-399 **Wearable Bio-Impedance Monitoring During Hemodialysis for
Chronic Kidney Disease**
Melanie Schoutteten*
- 14-396 **An Optimal Electrode Configuration to Measure Forced
Expirations Using a Wearable Bioimpedance Device**
Hélène De Cannière*, Karlien Geboers, Christophe JP Smeets,
Willemijn Groenendaal, Seulki Lee, Gabriel Squillace, Lars
Grieten, Pieter Vandervoort

S23 Cardiovascular Mechanics

- 15-28 **Classification Model of Heart Transplant Outcomes Based on Features of Left Ventricular Functional Geometry**
Tatiana Chumarnaya*, Sergey P. Mikhaylov, Eduard M. Idoev, Olga Solovyova
- 16-235 **Using Observed Contrast Motion During Cardiac Catheterization to Tune Patient Specific Coronary Blood Flow Simulations**
Stephen Moore*, Kerry Halupka, Sergiy Zhuk
- 17-237 **Towards Real-Time 3D Coronary Hemodynamics Simulations During Cardiac Catheterisation**
Stephen Moore*, Kerry Halupka, Sergiy Zhuk
- 18-274 **Mechano-Chemical Interactions in the Isotonic Twitch: A Modeling Study**
Lauren Dupuis*, Joost Lumens, Theo Arts, Tammo Delhaas
- 19-295 **Relationship Between Electrical Instability and Pumping Performance During Ventricular Fibrillation: Computation Study**
Daun Jeong*, Ki Moo Lim
- 20-339 **Reverse Electrical Remodeling Assessed by High-Frequency QRS Dyssynchrony and QRS Duration**
Pavel Leinveber*, Josef Halamek, Pavel Jurak, Magdalena Matejkova, Jolana Lipoldova, Miroslav Novak

- S24 Balistocardiography, Seismocardiography, and PPG**
- 21-337 **Multichannel Seismocardiography: A Novel Method for Investigating the Seismocardiogram**
Kim Munck*, Samuel Emil Schmidt, Kasper Sørensen, Johannes Struijk
- 22-110 **Discriminating Pre- and Postoperation Cardiac Conditions of Myocardial Infarction Using Smartphone-Derived Seismo- and Gyrocardiography**
Saeed Mehrang*, Mojtaba Jafari Tadi, Olli Lahdenoja, Matti Kaisti, Tuija Vasankari, Tuomas Kiviniemi, Juhani Airaksinen, Mikko Pankaala, Tero Koivisto
- 23-111 **Force-Interval Relationships of the Heart Measured With Photoplethysmography During Atrial Fibrillation**
Linda M. Eerikäinen*, Alberto Bonomi, Lukas Dekker, Fons Schipper, Rik Vullings, Ronald M. Aarts
- 24-186 **Unsupervised Artefact Detection and Screening Using Emfit Sensor in Patients With Sleep Apnea**
Dorien Huysmans*, Bertien Buyse, Dries Testelmans, Sabine Van Huffel, Carolina Varon
- 25-203 **Determining the Respiratory State From a Seismocardiographic Signal--A Machine Learning Approach**
Christian Ulrich*, Rolf Hansen, Martin Jensen
- 26-134 **Sleep Apnea Detection Using Pulse Photoplethysmography**
Margot Deviaene*, Jesus Lazaro, Dorien Huysmans, Dries Testelmans, Bertien Buyse, Sabine Van Huffel, Carolina Varon

- S31 Cardiac Function from Imaging**
- 27-73 **Dyssynchrony Assessment in Arrhythmogenic Cardiomyopathy With Left Ventricular Involvement**
Yolanda Vives-Gilabert*, Jorge Sanz, Antonio Cebrián, Raquel Cervigón, Jose Millet, Esther Zorio, Francisco Castells
- 28-261 **Quantification of the Anatomical Remodelling of the Ventricles of Arrhythmogenic Right Ventricular Cardiomyopathy Patients, an MRI Based Imaging Study**
Peter Marinov*, Ernesto Zacur, Pier Lambiase, Vincente Grau, Blanca Rodriguez, Alfonso Bueno-Orovio, Michele Orini
- 29-167 **Characterization of Pulmonary Hypertension Using Right Ventricular Regional Curvedness Derived From Cardiac Magnetic Resonance Imaging**
Soo Kng Teo*, Xiaodan Zhao, Ru San Tan, Liang Zhong, Yi Su
- 30-24 **Evaluation of Left Ventricle Myocardium Detection by a Fully Automatic Segmentation Using Geodesic Active Contour**
Gustavo Barizon*, Luiz Otávio Murta Junior
- 31-362 **A Semiautomated Approach for the Quantification of the Left Ventricle Chamber Volumes From Cine Magnetic Resonance Images**
Claudio Fabbri*, Keigo Kawaji, Noreen Nazir, Victor Mor Avi, Amit Patel, Cristiana Corsi
- 32-169 **Reconstruction of Patient-Specific Left Atrium Geometry From Cardiac Magnetic Resonance Imaging**
Soo Kng Teo*, Xiaodan Zhao, Ru San Tan, Liang Zhong, Yi Su

S32 Technical Progress in ECGI

33-374 Effect of Sampling Variation on ECG Imaging

Jess Tate*, Nejjib Zemzemi, Wilson Good, Peter van Dam, Dana Brooks, Rob MacLeod

34-70 Effects of ECG Signal Processing on the Inverse Problem of Electrocardiography

Laura Bear*, Yesim Serinagaoglu Dogrusoz, Jana Svehlikova, Jaume Coll-Font, Wilson Good, Eelco van Dam, Rob MacLeod, Emma Abell, Richard Walton, Ruben Coronel, Remi Dubois

35-309 Reduction of Effects of Noise on the Inverse Problem of Electrocardiography With Bayesian Estimation

Yesim Serinagaoglu Dogrusoz*, Laura R Bear, Jana Svehlikova, Wilson Good, Jaume Coll-Font, Eelco van Dam, Remi Dubois, Robert S MacLeod

36-335 Robustness of Reduced Order Nonparametric Model for Inverse ECG Solution Against Modeling and Measurement Noise

Önder Nazım Onak*, Yesim Serinagaoglu Dogrusoz, Gerhard Wilhelm Weber

37-88 Epicardial Isochrones and a New High-Frequency ECG Isochrones Technique

Pavel Jurak*, Uyên Châu Nguyễn, Ivo Viscor, Petr Andrla, Filip Plesinger, Frits Prinzen, Josef Halamek, Pavel Leinveber

38-343 Electrocardiographic Imaging: An Improved Algorithm for Evaluating the Global Activation Time in Patient-Specific Geometry

Shijie Zhou*, John Sapp, Amir AbdelWahab, Milan Horacek

S33 AF Drivers & Targets

- 39-137 **A K-Nearest Neighbour Classifier for Predicting Catheter Ablation Responses Using Noncontact Electrograms During Persistent Atrial Fibrillation**
Xin Li*, Gavin S Chu, Tiago Paggi de Almeida, João Salinet, Amar R Mistry, Zakariyya Vali, Peter J Stafford, Fernando S Schlindwein, G. André Ng
- 40-194 **Propagation Pattern Analysis of Panoramic Mapping From Patients With Persistent Atrial Fibrillation**
Nolwenn Tan*, Elizabeth Cheng, Martyn Nash, Martin Stiles, Stephan Willems, Pawel Kuklik, Jichao Zhao
- 41-138 **Dominant Frequency Variability Mapping for Identifying Stable Drivers During Persistent Atrial Fibrillation Using Noncontact Mapping**
Xin Li*, Gavin S Chu, Tiago Paggi de Almeida, João Salinet, Amar R Mistry, Zakariyya Vali, Peter J Stafford, Fernando S Schlindwein, G André Ng
- 42-279 **Reentrant Activity Detection During Atrial Fibrillation in Activation-Based 2D Mapping Agrees With Phase-Based 3D Mapping**
Miguel Rodrigo*, Christopher AB Kowalewsky, Andreu M. Climent, Ismael Hernandez-Romero, Tina Baykaner, Wouter-Jan Rappel, Maria S Guilem, Sanjiv M Narayan, Felipe Atienza
- 43-394 **Spatiotemporal Stability of Peak Bipolar Electrogram Entropy Regions in Sustained Human and Animal Atrial Fibrillation: Implications for Atrial Fibrillation Mechanism and Mapping**
Dhani Dharmaprani*, Andrew McGavigan, Darius Chapman, Rayed Kutieleh, Shivshankar Thanigaimani, Lukah Dykes, Jonathan Kalman, Prashathan Sanders, Kenneth Pope, Pawel Kuklik, Anand Ganesan
- 44-402 **Subclinical Atrial Fibrillation Detection and Relevance**
Pyotr Platonov*

S34 Medical Informatics

- 45-352 **Automatic Diagnoses Detection in Free Text ECG Medical Report**
Derick Oliveira*, Gabriela Paixão, Eder Figueiredo, Paulo Gomes, Milton Ferreira, Jéssica Canazart, Antonio Ribeiro, Wagner Meira
- 46-249 **Predictive Models for Risk Assessment of Worsening Events in Chronic Heart Failure Patients**
Maria Carmela Groccia*, Danilo Lofaro, Domenico Conforti, Angela Sciacqua
- 47-376 **Real-Time ECG Monitoring for Patients With Implantable Pacemaker – A Review of Current Status**
John Wang*
- 48-78 **An Algorithm to Sample an Anatomy With Uncertainty**
Cesare Corrado*, Steven Williams, Iain Sim, Sam Coveney, Mark O'Neill, Richard Wilkinson, Jeremy Oakley, Richard Clayton, Steven Niederer
- 49-342 **Heart Sounds Obtained With Noncontact Continuous-Wave Echo Doppler**
Johannes Struijk*, Dagbjört Helga Eiríksdóttir, Ásgerdur Arna Pálsdóttir, Samuel Emil Schmidt
- 50-276 **A Comparative Phonocardiography Study: Two Wavelet Based Methods for Fetal Heart Sound Detection**
Elisavet Koutsiana*, Leontios Hadjileontiadis, Ahsan Khandoker, Ioanna Chouvarda

S41 Heart Rate Variability: Methods

- 51-146 **Vector-Based Analysis of the Similarity Between Breathing and Heart Rate During Paced Deep Breathing**
Denis Kleyko, Evgeny Osipov, Urban Wiklund*
- 52-179 **Intrinsic Complexity of RR and QT Intervals at the Cellular Level**
Jiyeong Kim*, Ilya Potapov, Disheet Shah, Jukka Kuusela, Katriina Aalto-Setälä, Esa Räsänen
- 53-190 **Parametric Estimation of Entropy Using Higher Order Markov Chains for Heart Rate Variability Analysis**
Corrado Ameli, Roberto Sassi*
- 54-219 **Robust Estimation of the Scaling Exponent in Detrended Fluctuation Analysis of Beat Rate Variability**
Matti Molkkari*, Esa Räsänen
- 55-289 **Validity of Venous Waveform Signal for Heart Rate Variability Monitoring**
David Hernando*, Reid McCallister, Jesus Lazaro, Kyle Hocking, Eduardo Gil, Pablo Laguna, Colleen Brophy, Raquel Bailón
- 56-321 **Investigating Phasic Activity of Time-Varying High-Order Spectra: A Heartbeat Dynamics Study During Cold-Pressure Test**
Shadi Ghiasi*, Alberto Greco, Mimma Nardeli, Vincenzo Catrambone, Riccardo Barbieri, Pasquale Scilingo, Gaetano Valenza

S42 ECG Processing of Exercise

57-382 Analysis of ECG in Athletes Running in Mountain Route Conditions

Pedro Gomis*, Eduard Guasch, Alexandre Perera, Lluís Mont, Pere Caminal

58-143 Signal-Level Fusion With Convolutional Neural Networks for Capacitively Coupled ECG in the Car

Erik Breuer, Marian Walter*, Steffen Leonhardt, Christoph Hoog Antink

59-299 Autonomic Nervous System Effects on the Atrioventricular Conduction Time - Heart Period Relationship During Physical Exercise and Passive Recovery

Grégory Blain, Guillaume Ducrocq, Mathilde Peraldi, Olivier Meste*

60-364 Selection of Reliable RR Interval Segments Using Hidden Semi-Markov Models

Matthieu Doyen*, Di Ge, Guy Carrault, Alfredo Hernandez

61-210 Evaluation of a Continuous ECG Quality Indicator Based on the Autocorrelation Function

Jonathan Moeyersons*, Dries Testelmans, Bertien Buyse, Rik Willems, Sabine Van Huffel, Carolina Varon

62-38 GPU-Based Segmented-Beat Modulation Method for Denoising Athlete Electrocardiograms During Training

Amnah Nasim, Edoardo Della Santa, Damiano Tanchi, Agnese Sbrollini, Ilaria Marcantoni, Micaela Morettini, Laura Burattini*

S43 ECG & AF

- 63-36 **Shape Analysis of Consecutive Beats May Help in the Automated Detection of Atrial Fibrillation**
Filip Plesinger*, Petr Andrla, Ivo Viscor, Josef Halamek, Veronika Bulkova, Pavel Jurak
- 64-87 **P-Wave Analysis for Atrial Fibrillation Detection Using a Neural Network Clustering Algorithm**
Reza Firoozabadi*, Richard Gregg, Saeed Babaeizadeh
- 65-150 **The Signal Averaged P-Wave Is Able to Indicate the Clinical State of Atrial Fibrillation Disease**
Matthias Zink*, Stef Zeemering, Martijn Gilbers, Laurent Pison, Ulrich Schotten
- 66-266 **Atrial Fibrillation Detection by Exploiting the Spectral and Temporal Characteristics of ECG Signals With the Long Short-Term Memory Model**
Yen-Chun Chang*, Sau-Hsuan Wu, Li-Ming Tseng, Hsi-Lu Chao
- 67-31 **Atrial Fibrillation Spatiotemporal Complexity Is Affected by Pulmonary Vein Isolation**
Marianna Meo*, Carole Dumas-Pomier, Méléze Hocini, Michel Haïssaguerre, Rémi Dubois
- 68-59 **Quantitative Evaluation of Temporal Occurrence Patterns of Paroxysmal Atrial Fibrillation**
Monika Šimaitytė*, Andrius Petrėnas, Vaidotas Marozas, Justinas Bacevičius, Audrius Aidietis, Leif Sornmo

S44 Special Session: Personalized Medicine

69-81 Imaging-Based Simulations for Predicting Sudden Death and Guiding Ablation

Natalia Trayanova*

70-400 Personalization of Biomechanical Models for Early Detection of Disease

Nick Van Osta, Feddo Kirkels, Aurore Lyon, Tammo Delhaas, Maarten-Jan Cramer, Arco Teske, Joost Lumens*

71-64 Personalisation of Electromechanical Models: Are We There

Nicolas Cedilnik, Tania Bacoyannis, Maxime Sermesant*

72-63 Personalization of Cellular Electrophysiology Models: Utopia?

Michael Clerx*

73-403 Personalized Medicine: Discussion

Pietro Bonizzi*, Matthijs Cluitmans

S51 Heart Rate Variability: Applications

74-42 **The Heart Rate Variability Multifractality Spectrum and not the Power Spectrum Is Altered in Paraplegic Individuals With Low-Level Lesion**

Paolo Castiglioni*, Giampiero Merati, Andrea Faini

75-113 **Heart Rate Variability Analysis During Weaning From Mechanical Ventilation: Models for Prediction of the Weaning Trial Outcome**

Vessela Krasteva*, Mikhail Matveev, Irena Jekova, Georgi Georgiev

76-148 **Multidomain Short-Term Heart Rate Variability Analysis to Detect Single Night Sleep Deprivation on Drivers**

Jose Gallardo*, Giannina Bellone, Daniel Vigo, Mariano Llamedo Soria

77-243 **Dynamical Landscape of Heart Rhythm in Discerning Erratic Rhythm in Elderly People**

Danuta Makowiec*, Dorota Wejer, Joanna Wdowczyk, Marta Zarczynska-Buchowiecka, Zbigniew Struzik

78-319 **Heart Rate Variability Analysis Guided by Respiration in Major Depression Disorder**

Spyridon Kontaxis*, Michele Orini, Eduardo Gil, Mar Posadas-De Miguel, Maria Luisa Bernal, Jordi Aguiló, Concepción de la Camara, Pablo Laguna, Raquel Bailón

79-369 **Heart Rate Variability Analysis of Normal and Intrauterine Growth Restricted Children Using Sample Entropy**

Taher Biala*, J. Alexandre Lobo marques, Mahmoud Ehresh, Fernando Schlindwein, Michael Wailoo

- S52 Modeling Ion Channels and Cells**
- 80-224 **The Mechanism Underlying Heart Rate and Pacemaking Activity Decline in Developing Rabbit Sino-Atrial Node**
Azzah Alghamdi*, Craig P Testrow, Dominic G Whittaker, Henggui Zhang
- 81-267 **Mechanism of Sinus Node Dysfunction in Carriers of the E161K Mutation in the SCN5A Gene**
Ronald Wilders*
- 82-304 **Development and Validation of an In Silico Rabbit Purkinje Cell Action Potential Model: A Step Towards a Drug Safety Testing Tool**
Jordi Cano*, Julio Gomis-Tena, Alexander Amberg, Lennart Anger, Véronique Ballet, Jean-Michel Guillon, Manuel Pastor, Ferran Sanz, Lucia Romero, Javier Saiz
- 83-92 **Computational Mechanistic Investigation of Chronotropic Effects on Murine Sinus Node Cells**
Benjamin Winkelmann*, Eike Moritz Wülfers, Callum M. Zgierski-Johnston, Peter Kohl, Jens Timmer, Gunnar Seemann
- 84-354 **Isobestic Point in Optical Mapping With Di-4-ANBDQPQ Transmembrane Voltage Sensitive Dye**
ILIJA Uzelac*, flavio fenton
- 85-156 **Inward Rectifier Current Downregulation Promotes Spontaneous Calcium Release in a Novel Model of Rat Ventricular Electrophysiology**
Harley Stevenson-Cocks*, Michael Colman, Ed White, Alan Benson

S53 Simulations and Imaging in AF

86-34 Acute Morphological Changes in P-Wave Morphology During Pulmonary Vein Isolation in Atrial Fibrillation Patients

Ali Gharaviri*, Matthias Zink, Simone Pezzuto, Mark Potse, Stef Zeemering, Rolf Krause, Angelo Auricchio, Ulrich Schotten

87-297 In Silico Model of SK Channel Gating, Temperature Dependence, and Calcium Sensitivity

Ilse van Herck*, Bo H. Bentzen, Vincent Seutin, Jussi T. Koivumäki, Mary M. Maleckar, Neil V. Marrison, Andrew G. Edwards

88-291 Stationary and Recurrent Properties of Atrial Fibrillation Conduction Patterns in Goat

arne van hunnik*, Stef Zeemering, Piotr Podziemski, Giulia Gatta, Sander Verheule, Ulrich Schotten

89-366 Anatomically-Induced Fibrillation in a 3D Model of the Human Atria

Mark Potse*

90-160 Deep Learning for End-to-End Atrial Fibrillation Recurrence Estimation

Riddhish Bhalodia*, Anupama Goparaju, Alan Morris, Evgueni Kholmovski, Nassir Marrouche, Joshua Cates, Ross Whitaker, Shireen Elhabian

91-258 Development of New Left Atrial Anatomical Models for the Study of the Left Atrial Appendage Implications in Atrial Fibrillation

Alessandro Masci*, Lorenzo Barone, Corrado Tomasi, Cristiana Corsi

S54 ECG Processing and Artificial Intelligence

92-108 Supervised Transfer Learning for Personalized Heart Rate Based Epileptic Seizure Detection

Thomas De Cooman*, Carolina Varon, Wim Van Paesschen, Sabine Van Huffel

93-174 Cardiac Fibrosis Detection Applying Machine Learning Techniques to Standard 12-Lead ECG

Francisco-Manuel Melgarejo-Meseguer*, Francisco-Javier Gimeno-Blanes, Jose Luis Rojo-Alvarez, Mariela Salar-Alcaraz, Juan-Ramón Gimeno-Blanes, Arcadi García-Alberola

94-202 ECG Rhythm Analysis During Manual Chest Compressions Using an Artefact Removal Filter and Random Forest Classifiers

Iraia Isasi*, Ali Brahamid, Unai Irusta, Morteza Zabihi, Elisabete Aramendi, Trygve Eftestøl, Jo Kramer-Johansen, Lars Wik

95-326 Big Data in Tele-ECG: Evaluation of Clinical Outcomes in a Large Electronic Cohort

Gabriela Paixão*, Paulo Gomes, Luis Gustavo Silva, Milton Ferreira, Manoel Horta Ribeiro, Derick Oliveira, Jessica Canazart, Antonio Ribeiro, Jamil Nascimento, Leonardo Bonisson, Milena Marcolino, Antonio Luiz Ribeiro

96-327 Premature Ventricular Conduction Detection and Localization From the ECG Using a Neural Network

Alexander Vieira Pereira, Peter van Dam, Roger Abächerli*

97-378 Improving Generalization of Deep Models for Cardiac Disease Detection Using Limited Channel ECG

Deepta Rajan*, David Beymer

S61 Modeling Ensembles of Cells

98-68 A Heterogeneous Formulation of the Himeno et al. Human Ventricular Myocyte Model for Simulation of Body Surface ECGs

Axel Loewe*, María Hernández Mesa, Nicolas Pilia, Stefano Severi, Olaf Doessel

99-188 A Novel Model of the Rabbit Atrial Myocyte for the Study of Ca²⁺ Mediated Arrhythmia

Maxx Holmes*, Alan P Benson, Oleg Aslanidi, Michael A Colman

100-57 Microscopic Simulation of the Cardiac Electrophysiology: A Study of the Influence of Different Gap Junctions Models

Pierre-Elliott Bécue*, Mark Potse, Yves Coudière

101-86 In Silico Populations Optimized Based on Optogenetic Recordings Predict Drug Effects in Human-Induced Pluripotent Stem Cell Derived Cardiomyocytes

Michelangelo Paci*, Elisa Passini, Aleksandra Klimas, Stefano Severi, Jari Hyttinen, Blanca Rodriguez, Emilia Entcheva

102-356 Insights Into the Mechanisms of Calcium Wave Propagation Failure From a Computational Model of the Rabbit Atrial Cardiomyocyte

Marcia Vagos*, Jordi Heijman, Hermenegild Arevalo, Ulrich Schotten, Joakim Sundnes

103-139 Geometric Wavelength for Monitoring Dynamic Changes in Repolarization Caused by Time-Varying Parameters

Ariane Saliani, Narendra Shivaraman, Vincent Jacquemet*

S62 Special Session: Physics Based vs ML Based

104-348 A Common-Ground Review of the Potential for Machine Learning Approaches in Electrocardiographic Imaging Based on Probabilistic Graphical Models

Jaume Coll-Font*, Linwei Wang, Dana Brooks

105-75 Deep Generative Modeling and Analysis of Cardiac Transmembrane Potential

Sandesh Ghimire*, Linwei Wang

106-144 Electrocardiogram Monitoring and Interpretation: From Traditional Machine Learning to Deep Learning, and Their Combination

Saman Parvaneh*, Jonathan Rubin

107-69 Combining Biophysical Modeling and Machine Learning to Predict Location of Atrial Ectopic Triggers

Eduardo Godoy, Miguel Lozano, Ignacio Garcia-Fernandez, Rafael Sebastian*

- S63 Cardiorespiratory Autonomic Iterations**
- 108-45 **Phonocardiography-Delineator: An Efficient Algorithm for Automatic Heart Sounds Detection in Fetal Phonocardiography**
Annachiara Strazza, Agnese Sbrollini*, Valeria di Battista, Rita Ricci, Letizia Trillini, Ilaria Marcantoni, Micaela Morettini, Sandro Fioretti, Laura Burattini
- 109-9 **Fetal Developmental Deviations Reflected in a Functional Autonomic Brain Age Score**
Dirk Hoyer*, Alexander Schmidt, Uwe Schneider, Kathleen Gustafson
- 110-54 **Pilot Study on Electrocardiogram Derived Respiratory Rate Using a Wearable Armband**
Jesus Lazaro*, Raquel Bailón, Eduardo Gil, Yeonsik Noh, Pablo Laguna, Ki Chon
- 111-310 **Identification of Fetal Cardiac Timing Events by Swarm Decomposition of Doppler Cardiogram Signal**
Saeed Alnuaimi*, Shihab Jimaa, Yoshitaka Kimura, Georgios Apostolidis, Leontios Hadjileontiadis, Ahsan Khandoker
- 112-26 **Autonomic, Cardiovascular, and Respiratory Responses to Hyperglycemic Stimulus in Healthy Subjects**
Salvador Carrasco-Sosa, Alejandra Guillén-Mandujano*
- 113-122 **Early Detection of Cheyne-Stokes Breathing via ECG-Derived Respiration in Patients With Severe Heart Failure: A Pilot Study**
Pauline Guyot*, Bruno Chenuel, El-Hadi Djerroune, Thierry Bastogne

- S64 ECG Processing of Ventricular Repolarization**
- 114-67 **A Novel Electrocardiograph for Analysis of Ventricular Repolarisation**
Laura Cooney*, Peter Macfarlane
- 115-43 **T-Wave Alternans in Partial Epileptic Patients**
Ilaria Marcantoni, Valeria Cerquetti, Valentina Cotechini, Maeva Lattanzi, Agnese Sbrollini, Micaela Morettini, Laura Burattini*
- 116-302 **Intrauterine Growth Restriction Induced ECG Morphological Differences Measured in Adulthood**
Nuria Ortigosa*, Merida Rodriguez-Lopez, Raquel Bailón, Alvaro Sepulveda, Fatima Crispi, Pablo Laguna
- 117-180 **Theoretical and Empirical Estimates of V-Index Variability**
Massimo W Rivolta*, Luca Mainardi, Roberto Sassi
- 118-53 **Multiscale Complexity Analysis of Short QT Interval Variability Series Stratifies the Arrhythmic Risk of Long QT Syndrome Type 1 Patients**
Vlasta Bari*, Beatrice De Maria, Giulia Girardengo, Emanuele Vaini, Beatrice Cairo, Lia Crotti, Paul Brink, Peter Schwartz, Alberto Porta
- 119-19 **An Instantaneous Measure of ECG Signal Quality**
Sasan Yazdani*, Jean-Marc Vesin

- P71 Modeling Ion Channels, Cells and Fetal Signals**
- 120-32 **A Novel Model of Electrical Action Potentials of Teleost Fish Ventricular Myocytes**
Hamsa Naser*, Dominic G Whittaker, Holly Shiels, Mark Boyett, Henggui Zhang
- 121-65 **Mechano-Electric Feedbacks in a New Model of the Excitation-Contraction Coupling in Human Cardiomyocytes**
Nathalie Balakina-Vikulova*, Olga Solovyova, Alexander Panfilov, Leonid Katsnelson
- 122-140 **Fibroblasts Induce Calcium Alternans When Coupled to Cardiomyocytes: A Simulation Study**
Maria Teresa Mora, Albert Dasi, Javier Saiz, Beatriz Trenor, Jose M Ferrero*
- 123-62 **New Mathematical Model of Electromechanical Coupling in Rat Cardiomyocytes**
Leonid Katsnelson*, Pavel Konovalov, Olga Solovyova
- 124-103 **Simultaneous Electrical and Fluorescence Recording of HL-1 Cells Electrical Activity in Response to Extracellular Calcium Stimulation**
Ondrej Svoboda*, Larisa Baiazitova, Vratislav Cmiel, Josef Skopalik, Zdenka Fohlerova, Jaromir Hubalek, Ivo Provaznik
- 125-170 **Effects of CaMKII Regulation on Atrial Action Potential Under Oxidative Stress Condition**
Haibo Sui, Qince Li*, Kuanquan Wang, Funebi Francis Ijebu, Yongfeng Yuan, Henggui Zhang
- 126-184 **Computational Modelling of Cardiac Metabolism in Atrial Myocytes**
Funebi Francis Ijebu*, Qince Li, Kuanquan Wang, Haibo Sui, Lufang Zhou, Henggui Zhang
- 127-323 **RyRs Coupling Causes a Calcium Leak in Cardiac Cell**
Alexander Ryvkin*, Nikita Markov

- 128-333 **Optimization of the O'Hara-Rudy Model of Human Ventricular Action Potential With Respect to Electrolyte Concentrations and Rate Dependence**
Chiara Bartolucci*, Elisa Passini, Stefano Severi
- 129-193 **Role of Funny Current in Biological Pacemaker Based on Human Ventricular Model**
Yacong Li*, Kuanquan Wang, Qince Li, Xiangyun Bai, Henggui Zhang
- 130-367 **State-Space Detection of the Impulse Response Gain and Delay From Intrapartum Cardiotocography**
Philip Warrick*, Emily Hamilton
- 131-228 **Proliferation of Fibroblast Modulates the Action Potential Duration Dispersion: An Atrial Fibrosis Model Using Fractional Diffusion**
Juan P Ugarte*, Catalina Tobon, Laura C Palacio, Henry Andrade-Caicedo, Javier Saiz

P72 Modeling Drug Effects and Mutations

132-58 Sulfur Dioxide Effects on Human Atrial Action Potential. In Silico Study

Catalina Tobon, Diana C Pachajoa, Juan P Ugarte*, Laura C Palacio, Javier Saiz

133-124 Carbon Monoxide Effects on Electrophysiological Mechanisms of Ventricular Arrhythmogenesis

Moza Al-Owais, Arun Holden*, Alan Benson

134-166 Effects of the β -Adrenoceptor Blocker Carvedilol in Short QT Syndrome Caused by N588K Mutation in hERG: A Simulation Study

Cunjun Luo*, Linghua Li, Tong Liu, Kuanquan Wang, Xiangyun Bai, Henggui Zhang

135-48 In Silico Investigation of the Functional Impact of SCN10A Mutations in Human Atrial Cells

Inas A Al Nemi*, Haibo Ni, Henggui Zhang

136-133 Modelling the Effects of Propafenone on Human Atrial Patho-Electrophysiology Associated With hERG-Linked Short QT Syndrome

Dominic G Whittaker*, Jules C Hancox, Henggui Zhang

137-213 Impact of Two Different CaV 1.2 Mutations on Cardiac Action Potential and Calcium Content

Gunnar Seemann*, Sebastian Kummer, Susanne Rinné, Niels Decher

P73 Fibrillation, Reentry, and Defibrillation T5

138-130 Effects of Atrial Fibrillation on the Coronary Flow at Different Heart Rates: A Computational Approach

Caterina Gallo*, Stefania Scarsoglio, Luca Ridolfi

139-298 Parameter Sensitivity Analysis to Predict Action Potential Duration Alternans in Cardiac Electrophysiology Simulation

Nida Dusturia*, Ki Moo Lim

140-225 The Effects of Nonischemic Fibrosis Scar Morphology on Mechanisms of Reentry

Gabriel Balaban*, Caroline Mendoca Costa, Brian Halliday, Bradley Porter, Wenjai Bai, Gernot Plank, Christopher Rinaldi, Daniel Rueckert, Sanjay K. Prasad, Martin Bishop

141-340 Predicting and Observing Chaotic Dynamics in Excitable Media Using Machine Learning

Ulrich Parlitz*, Roland Zimmermann

142-233 Particle Filter Tracking of Complex Stochastic Systems Applied to In Silico Wavefront Propagation

Gonzalo Ricardo Ríos-Muñoz*, Antonio Artés-Rodríguez, Joaquín Míguez

P74 Whole Heart Modeling T5

143-183 Patient-Tailored In Silico 3D Simulations and Models From Electroanatomical Maps of the Left Atrium

Gonzalo Ricardo Ríos-Muñoz*, Sara Rocher, Antonio Artés-Rodríguez, Ángel Arenal, Javier Saiz, Carlos Sánchez

144-10 A Multiscale Intracranial Pressure Signal Simulator

Federico Wadehn, David-Jule Mack, Emanuela Keller, Thomas Heldt*

145-96 A Support Vector Regression-Based Data-Driven Leaflet Modeling Approach for Personalized Aortic Valve Prosthesis Development

Jannis Hagenah*, Tizian Evers, Michael Scharfschwerdt, Achim Schweikard, Floris Ernst

146-47 Impact of Limits in Pathways Between Sinoatrial Node and Atrium on Heart Rhythm by Timed Automata Model

Danuta Makowiec*, Zbigniew Struzik

147-114 Universal Ventricular Coordinates: A New Way to Transfer Purkinje Networks Between Meshes

Julien Bouyssier*, Jason Bayer, Edward Vigmond

148-223 A Study on the Characteristics Influencing the Pressure in the Inlet of a One-Dimensional Model of Arterial Structure

Shima Abdullateef*, Jorge Mariscal-Harana, Jordi Alastruey, Ashraf Khir

149-285 Heart Block in the Athlete – Role of Ion Channel Remodelling as Studied Using a One-Dimensional Computational Model of the Atrioventricular Node

Jue Li*, Pietro Mesirca, Alicia D'Souza, Shu Nakao, Charlotte Cox, Jules Hancox, Matteo Mangoni, Mark Boyett

150-55 Optical Mapping Could Reveal Two-Dimensional Morphology of Atrioventricular Electrical Insulation in the Foetal Avian Heart

Veronika Olejnickova*, Oto Janousek, Marina Ronzhina, Jakub Hejc, Alena Kvasilova, Eva Zabrodska, David Sedmera

P75 Arrhythmia 3a

151-172 In Silico Comparison of Phase Maps Based on Action Potential and Extracellular Potential

Konstantin Ushenin*, Artem Razumov, Vitaliy Kalinin, Olga Solovyova

152-296 Trajectories of the Single Moving Equivalent Dipole in Subjects With Left Fascicular Block

Vito Starc*, Cees A. Swenne

153-384 Validation of Noninvasive Electrophysiological Mapping Accuracy Using Endocardial Pacing With Three-Dimensional Nonfluoroscopic Electroanatomic Mapping

Margarita Budanova*, Mikhail Chmelevsky, Stepan Zubarev, Danila Potyagaylo, Boris Rudic, Erol Tulumen, Martin Borggrefe

154-290 QRS Complex Classifier for Personalized Healthcare Applications

Rohit Hadia*, Dewar Finlay, Daniel Guldenring, Ghalib Muhammad Waqas Janjua, Raymond Bond, James McLaughlin

155-109 Unobtrusive Contactless Cardiac Monitoring for Telemedicine and Ambient Assisted Living

Andres Lorenzo Bleda*, Rafael Maestre Ferriz, Arcadio Garcia Alberola

- P76 Ischemia and Infarct Analysis with ECG and Imaging**
- 156-85 **Detection of ST-Segment Variation in ECG Using Transfer Entropy**
Ilya Potapov*, Esa Räsänen
- 157-128 **Automatic Segmentation of Myocardial Infarction in Rats Subjected to Regional Ischemia**
Roman Jakubicek, Jiri Chmelik*, Jan Neckar, Radim Kolar
- 158-51 **High Frequency QRS Analysis From Orthogonal Leads**
Josef Halamek*, Pavel Leinveber, Marek Malik, Filip Plesinger, Magdalena Matejkova, Jolana Lipoldova, Pavel Jurak

P77 New Approaches and Applications of ECGI

- 159-381 **Evaluation of ECG Imaging Accuracy for Biventricular Pacings in Patients With a Cardiac Resynchronization Therapy Device**
Danila Potyagaylo*, Mikhail Chmelevsky, Stepan Zubarev, Margarita Budanova, Dmitry Lebedev
- 160-324 **Forcing Transmembrane Voltages to Decrease Slowly: A Temporal Regularization for ECG Imaging**
Steffen Schuler*, Axel Loewe, Olaf Doessel
- 161-105 **Body-Surface Mapping Using High-Frequency ECG to Characterize Electrical Activation Delay**
Petr Andrla*, Pavel Leinveber, Uyên Châu Nguyễn, Ivo Viscor, Filip Plesinger, Frits Prinzen, Josef Halamek, Magdalena Matejkova, Pavel Jurak
- 162-314 **A Learning Based Statistical Approach for Combining Multiple Measurements in Electrocardiographic Imaging**
Taha Erenler*, Yesim Serinagaoglu Dogrusoz
- 163-315 **Impact of Signal Preprocessing on the Inverse Localization of the Origin of Ventricular Tachycardia**
Jana Svehlikova*, Jan Zelinka, Yesim Serinagaoglu Dogrusoz, Wilson Good, Milan Tysler, Laura Bear
- 164-265 **Automatic Generation of Biventricular Models of Cardiac Electrophysiology for Patient Specific Personalization Using Noninvasive Recordings**
Karli Gillette*, Anton Prassl, Jason Bayer, Edward Vigmond, Aurel Neic, Gernot Plank
- 165-101 **T-Wave Alternans Analysis With Electrocardiographic Imaging**
Jose Luis Rojo-Alvarez*, Rebeca Goya-Esteban, Sergio Muñoz-Romero, Arcadi García-Alberola, Manuel Blanco-Velasco
- 166-157 **ECG Imaging Ventricular Ischemia Using Torso Electrodes: A Computational Study**
Vinay Kara*, Haibo Ni, Henggui Zhang

- 167-182 **Electrocardiographic Imaging of Atrial Fibrillation Detects Sites of Acute Termination After Rotor Ablation**
Miguel Rodrigo*, Andreu M. Climent, Ismael Hernandez-Romero, Tina Baykaner, Wouter-Jan Rappel, Maria S Guillem, Felipe Atienza, Sanjiv M Narayan
- 168-344 **The Heart Recording Conditions Impacts on the Assessment of the Electrocardiography Imaging Inverse Solution**
Amel Karoui*, Laura Baer, Pauline Migerditichan, Mostafa Bendahmane, Nejib Zemzemi
- 169-347 **Comparison of Left Ventricle Late Activation Zones Determined Using Noninvasive Electrophysiological Mapping With Sequential CT and MRI**
Stepan Zubarev*, Mikhail Chmelevsky, Danila Potyagaylo, Margarita Budanova, Sergey Rud, Anton Ryzhkov, Dmitriy Lebedev
- 170-350 **Conduction Variability in the Infarct Border Zone Due to Transient Ischemia: Effects on the High-Resolution ECG**
Dietrich Romberg*, Edward J Berbari
- 171-239 **Quantitative Analysis of Rotor Distribution in Atrial Fibrillation via Noninvasive Electrocardiographic Imaging**
Roland Sanford*, Jonathan Chrispin, Saman Nazarian, Linwei Wang
- 172-259 **An Adaptive Laplacian Based Interpolation Algorithm for Noise Reduction in Body Surface Potential Maps**
Ali Rababah*, Dewar Finlay, Daniel Guldenring, Raymond Bond, James McLaughlin

P78 Waveform Analysis 4a

173-287 Correlation and Clustering Properties of Premature Ventricular Contractions in 24-Hour ECGs of Postinfarction Patients

Annette Witt*

174-151 Invariant Mean Electrical Axis in Electrocardiogram

Kjell Le*, Trygve Eftestøl, Kjersti Engan, Stein Ørn, Øyunn Kleiven

175-46 Integrating the Exercise and Environmental Data Into a Digital ECG Structure by Watermarking Technique

Piotr Augustyniak*

176-375 Detecting Flutter Waves in the Electrocardiogram Using Generalized Likelihood Ratio Test

Muhammad Haziq Kamarul Azman*, Olivier Meste, Kushsairy Kadir

177-379 Versatile Detector of Pseudo Periodic Patterns

Augusto Santini*, Emiliano Diez, Mariano Llamedo Soria

178-95 Spectral-Based Analysis of Progressive Dynamical Changes in the Fetal Heart Rate Signal During Labor by Using Empirical Mode Decomposition

Patricio Fuentealba*, Alfredo Illanes, Frank Ortmeier

P79 ECG Heterogeneity 4a

179-162 The Reproducibility of Global Electrical Heterogeneity ECG Measurements

Erick Andres Perez Alday*, Christopher Hamilton, Annabel Lipershi, Jose Manuel Monroy Trujillo, Michelle Estrella, Stephen M sozio, Bernard Jaar, Rulan Parekh, Larisa Tereshchenko

180-177 T-Wave Morphology Restitution in Chronic Heart Failure Patients With Atrial Fibrillation

Flavio Palmieri*, Juan Pablo Martínez, Laura Burattini, Julia Ramírez

181-277 ECG-Based Monitoring of Electrolyte Fluctuations During the Long Interdialytic Interval

Ana Rodrigues*, Andrius Petrėnas, Neda Kušleikaitė-Pere, Pablo Laguna, Vaidotas Marozas

P7A Wavelet ECG 4a

182-336 Wavelet Based Algorithm for the Automatic Detection of Activations in Intracardiac Records in the Presence of Supraventricular Tachyarrhythmia

Jaime Yagüe-Mayans, Francisco Castells, Javier Moreno, Jose Millet*, Raquel Cervigón

183-200 An Efficient Algorithm Based on Wavelet Transform to Reduce Powerline Noise From Electrocardiograms

Juan Ródenas, Manuel García, José J Rieta, Raul Alcaraz*

P7B ECG Fidocial Detection 4a

- 184-141 **Performance Analysis of T-Wave-Offset Detection Algorithms on Patients With Cardiac Diseases**
Deborah Nairn*, Pietro Bonizzi, Joël Karel, Alfonso Aranda
- 185-123 **R-Peak Detection in Holter ECG Signals Using Non-Negative Matrix Factorization**
Pauline Guyot*, Pascal Voiriot, El-Hadi Djermoune, Stéphane Papelier, Céline Lessard, Mathieu Felices, Thierry Bastogne
- 186-155 **Multidimensional Vectorcardiography. Is More Better?**
Alfonso Aranda*, Pietro Bonizzi, Joel Karel, Ralf Peeters
- 187-82 **A Multilead QRS Complex Detection Method on 12-Lead Electrocardiogram Signals**
Wei Zhao*, Yanwu Xu, Yan Cong, Jing Hu, Jia Dongya, wang hongmei, Tianyuan You
- 188-281 **Analysis of the Observation Sequence Duration of Hidden Markov Models for QRS Complex Detection in Single-Lead ECG Recordings**
Nelson Monroy*, Miguel Altuve
- 189-52 **Real-Time Detection of Pace Pulses in a Single Lead ECG**
Irena Jekova*, Serafim Tabakov, Ivo Iliev, Valentin Tsibulko, Krasimira Kostikova

P7C Denoising ECG 4a

190-100 Detection of Unicolor ECG Electrode Reversals in Standard 12-Lead ECG

Irena Jekova*, Remo Leber, Vessela Krasteva, Ramun Schmid

191-198 Kalman Filter Based Electromyographic Signal Suppression of Real-Time ECG Signal

Meng Chen*, Wenzhuo Shi

192-165 Global Electrical Heterogeneity: Mechanisms and Clinical Significance

Larisa Tereshchenko*

193-209 A Novel Algorithm for Full-Automatic Multipurpose ECG Delineation

Antoun Khawaja*

194-229 A Novel Algorithm for Full-Automatic ECG Interpretation and Diagnostics

Antoun Khawaja*

195-231 Variational Mode Decomposition Features for Heartbeat Classification

Amalia Villa Gómez*, Sibasankar Padhy, Rik Willems, Sabine Van Huffel, Carolina Varon

P7D ECG Mapping 4A

- 196-132 **Validation of Activation Recovery Interval in Structurally Normal Human Ventricles by Optical Mapping**
Peter Langfield*, Edward Vigmond
- 197-149 **Action Potential Modelling in Isolated Rat Hearts During Hypokalemia**
Mariano Llamedo Soria*, Emiliano Diez
- 198-286 **Sequential Electro-Anatomical Mapping Methodology and Preliminary Results for Reentry Vulnerability Index Estimation**
Michele Orini*, Ben Hanson, Peter Taggart, Fernando Campos, Jaswinder Gill, Martin Bishop, Pier Lambiase
- 199-383 **Testing a Simple Model of the Unipolar Electrogram in the Intact Human Heart and Examples of Applications**
Michele Orini*, Peter Taggart, Pier Lambiase
- 200-345 **Evaluation of Multilead ECG Markers to Track Changes in Dispersion of Ventricular Repolarization in the Intact Human Heart**
Michele Orini*, Neil Srinivasan, Peter Taggart, Pier Lambiase

S81 Modeling Arrhythmias and Defibrillation

201-118 Determining Surface Stimulation Parameters With Computational Cardiac Electrophysiology to Defibrillate Human Ventricles

Angel Moreno*, Richard Walton, Claudia E. Hawks, Edward Vigmond, Jason Bayer

202-131 Role of Cardiac Microstructure Variability on Ventricular Arrhythmogenesis

Dominic G Whittaker*, Alan P Benson, Irvin Teh, Jurgen E Schneider, Michael A Colman

203-385 Phase Space Approach in Quantification of Arrhythmia Induction Caused by Potassium Heterogeneities in Isolated Rabbit Hearts

ILIJA Uzelac*, flavio fenton

204-206 A Multiscale Computational Model of Calcium-Mediated Ectopy in the Human Postinfarction Heart

Fernando Campos*, Joao F. Fernandes, Yohannes Shiferaw, Titus Kuehne, Martin Bishop, Gernot Plank

205-390 Diastolic-Interval-Based Control as a Method for Preventing Cardiac Tachyarrhythmias

Niels Otani*

206-334 Features of Chaotic Transients in Excitable Media Modeling Cardiac Arrhythmias

Ulrich Parlitz*, Thomas Lilienkamp

S82 Cardiac Autonomic Iterations

207-171 Asymmetry Assessment of Cardiac and Sympathetic Arms of the Baroreflex

Beatrice De Maria*, Vlasta Bari, Beatrice Cairo, Emanuele Vaini, Elisabeth Lambert, Murray Esler, Mathias Baumert, Sergio Cerutti, Laura Dalla Vecchia, Alberto Porta

208-358 Microgravity Exposure Alters Sympathetic Modulation of Ventricular Repolarization Quantified From the ECG via Periodic Repolarization Dynamics

Saúl Palacios*, Juan Pablo Martínez, Esther Pueyo

209-282 ECG-Derived Sympathetic and Parasympathetic Nervous System Dynamics: A Congestive Heart Failure Study

Gaetano Valenza*, Luca Citi, Philip Saul, Riccardo Barbieri

210-25 Effects of Two Types of Linearly Increased Isometric Exercise on Instantaneous Baroreflex and Respiratory Sinus Arrhythmia Sensitivities Computed by Alpha Index

Alejandra Guillén-Mandujano*, Salvador Carrasco-Sosa

211-273 Relationship Between Blood Pressure and Heart Rate Circadian Rhythms in Normotensive and Hypertensive Subjects

Giulia Silveri*, Lorenzo Pascazio, Agostino Accardo

212-61 Analysis of Linear and Nonlinear Central-Cardiorespiratory Coupling Pathways in Healthy Subjects

Steffen Schulz*, Aniol Serra Juhé, Beatriz Giraldo, Jens Haueisen, Karl-Juergen Baer, Andreas Voss

S83 Challenge I

- 213-49 **You Snooze, You Win: The PhysioNet/Computing in Cardiology Challenge 2018**
Gari Clifford*, Benjamin Moody, Mohammad Ghassemi, Haoqi Sun, Brandon Westover
- 214-332 **Automated Recognition of Sleep Arousal Using Multimodal and Personalized Deep Ensembles of Neural Networks**
Andrea Patane*, Shadi Ghiasi, Enzo Pasquale Scilingo, Marta Kwiatkowska
- 215-252 **Automatic Scoring of Non-Apnoea Arousals Using the Polysomnogram**
Nadi Sadr*, Madhuka Jayawardhana, Asghar Tabatabaei Balaei, Philip de Chazal
- 216-232 **Automated Detection of Sleep Arousals From Polysomnography Data Using a Dense Convolutional Neural Network**
Matthew Howe-Patterson, Bahareh Pourbabaei*
- 217-284 **Evaluating Convolutional and Recurrent Neural Network Architectures for Arousal Detection**
Ali Shoeb*, Niranjan Sridhar
- 218-247 **Using Auxiliary Loss to Improve Sleep Arousal Detection With Neural Network**
Bálint Varga, Márton Görög, Péter Hajas*

S84 ECG Processing of Ventricular Repolarization

219-30 **Detecting Strict Left Bundle Branch Block From 12-Lead Electrocardiogram Using Support Vector Machine Classification and Derivative Analysis**

Nipun Perera*, Chathuri Daluwatte

220-154 **A Wavelet-Based Approach for Automatic Diagnosis of Strict Left Bundle Branch Block**

Alba Martin*, Juan Pablo Martínez

221-204 **An Accurate Shock/No-Shock Decision Algorithm for Use During Piston-Driven Chest Compressions**

Iraia Isasi*, Unai Irusta, Elisabete Aramendi, Unai Ayala, Erik Alonso, Jo Kramer-Johansen, Trygve Eftestøl

222-216 **Identification of Strict Left Bundle Branch Block, Using a Moving Dipole Model**

Werner Bystricky*

223-292 **Deep Learning Based QRS Multilead Delineator in Electrocardiogram Signals**

Julià Camps*, Blanca Rodriguez, Ana Minchole

224-99 **Serial ECG Analysis: Absolute Rather Than Signed Changes in the Spatial QRS-T Angle Should Be Used to Detect Emerging Pathology**

Agnese Sbröllini*, Marjolein de Jongh, C. Cato ter Haar, Roderick W Treskes, Sumche Man, Laura Burattini, Cees A. Swenne

S91 ECGI in Clinical Applications

- 225-325 **Personalized Computational Framework to Study Arrhythmia Mechanisms on Top of ECG Image-Detected Substrate**
Matthijs Cluitmans*, Éric Lluch, Hernán Morales, Jordi Heijman, Paul Volders
- 226-303 **Noninvasive Electrocardiographic Imaging of Scar-Related Ventricular Tachycardia: Association With Magnetic Resonance Scar Imaging**
Omar Gharbia, Susumu Tao, Albert C. Lardo, Henry Halperin, Linwei Wang*
- 227-387 **Clinical Validation of ECG Image Epi-Endocardial Mapping Accuracy: Single Center Single-Blind Cross-Sectional Study**
Mikhail Chmelevsky*, Margarita Budanova, Stepan Zubarev, Danila Potyagaylo, Tatiana Treshkur, Dmitry Lebedev
- 228-311 **Complete-Chamber Conduction Velocity Estimation During Arrhythmias**
Ismael Hernández-Romero*, Alejandro Liberos, Miguel Rodrigo, Carlos Figuera, Maria S Guillem, Francisco Fernández-Avilés, Felipe Atienza, Andreu M. Climent
- 229-185 **Automatic Location of the Atrial Anatomy Under Cumulative Spatial Artifacts Based on ECG Imaging**
Victor Gisbert, Alejandro Liberos, Ismael Hernandez-Romero, Andreu M. Climent, Felipe Atienza, Maria S Guillem, Miguel Rodrigo*
- 230-283 **Early Results on the Utilisation of ECG-Imaging During Catheter Ablation Procedures for Prediction of Sites of Earliest Activation During Re-entrant Ventricular Tachycardia**
Michele Orini*, Adam Graham, Mehul Dhinoja, Ross Hunter, Richard Schilling, Anthony Chow, Peter Taggart, Pier Lambiase

S92 Challenge II

231-401 Physionet Challenge 2018 - Overview

Gari Clifford*

232-257 Automatic Sleep Arousal Detection Using Multimodal Biosignal Analysis

Ali Bahrami Rad*, Morteza Zabihi, Simo Särkkä, Serkan Kiranyaz, Aggelos K. Katsaggelos, Moncef Gabbouj

233-40 Automated Sleep Arousal Detection Based on EEG Enveloprams

Filip Plesinger*, Petr Nejedly, Ivo Viscor, Petr Andrla, Josef Halamek, Pavel Jurak

234-89 Detection of Respiratory Effort Related Arousals Using Hidden Markov Model and Random Decision Forest

János Szalma*, András Bánhalmi, Vilmos Bilicki

235-60 Identification of Arousals With Deep Neural Networks Using Different Physiological Signals

Runnan He*, Kuanquan Wang, Yang Liu, Na Zhao, Yongfeng Yuan, Qince Li, Henggui Zhang

236-380 Detection of Sleep Arousals Based on Spatiotemporal Features

Muhammad Bilal*, Muhammad Rizwan Khan, Hassan Aqeel Khan, Maham Qureshi, Sajid Saleem

S93 Cardiac Arrest & Resuscitation

237-93 Deep Learning for Pulse Detection in Out-of-Hospital Cardiac Arrest Using the ECG

Andoni Elola*, Elisabete Aramendi, Unai Irusta, Artzai Picón, Erik Alonso, Pamela Owens, Ahamed Idris

238-159 Comparison of Pediatric and Adult ECG Rhythm Analysis by Automated External Defibrillators During Out-of-Hospital Cardiac Arrest

Vessela Krasteva*, Sarah Ménétré, Irena Jekova, Todor Stoyanov, Daniel Jost, Benoit Frattini, Sabine Lemoine, Frédéric Lemoine, Vincent Thomas, Jean-Philippe Didon

239-107 A Method to Suppress Chest Compression Artifact Enhancing Capnography-Based Ventilation Guidance During Cardiopulmonary Resuscitation

Mikel Leturiondo*, Jose Julio Gutierrez, Sofia Ruiz de Gauna, Jesus Ruiz, Luis Alberto Leturiondo, James Knox Russell, Mohamud Daya

240-97 Finger Photoplethysmography to Monitor Chest Compression Rate During Out-of-Hospital Cardiac Arrest

Andoni Elola*, Jon Urteaga, Elisabete Aramendi, Unai Irusta, Erik Alonso, Mohamud Daya, Pamela Owens, Ahamed Idris

241-116 CPR Guideline Chest Compression Depths May Exceed Requirements for Optimal Physiological Response

Olibhéar McAlister*, Daniel Guldenring, Finlay Dewar, Raymond R. Bond, Hannah Torney, Ben McCartney, Laura Davis, Paul Crawford, Adam Harvey

242-246 Estimation of Chest Compression Rate and Detection of Hands-off Intervals During Resuscitation With Automated External Defibrillators

Jesus Ruiz, Sofia Ruiz de Gauna*, Pablo Bahillo, Digna María González-Otero, Purificación Saiz, Daniel Alonso, Karlos Ibaguren

- S94 ECG Processing and Arrhythmias**
- 243-33 **Mean Temporal Spatial Isochrones as Marker for Activation Delay in Patients With Arrhythmogenic Cardiomyopathy**
Rob Roudijk*, Peter Loh, Eelco van Dam, Peter van Dam
- 244-120 **A Hidden Markov Model Approach for Ventricular Fibrillation Detection**
Borja Altamira, Erik Alonso*, Unai Irusta, Elisabete Aramendi, Mohamud Daya
- 245-153 **A Comparison of ECG Waveform Features for the Classification of Normal and Abnormal Heartbeats**
Emilien Le Flahat*, Jean-Christophe Billard, Eric Plourde
- 246-355 **Localizing Atrial Flutter Circuit Using Variability in the Vectorcardiographic Loop Parameters**
Muhammad Haziq Kamarul Azman*, Olivier Meste, Kushsairy Kadir, Decebal Gabriel Latcu
- 247-163 **Real-Time Fusion of ECG and SpO2 Signals to Reduce False Alarms**
Jianwei Su, Sanchao Liu, Zehui Sun, Bailei Sun, Wenyu Ye, Cadathur Rajagopalan*, Xianliang He
- 248-91 **Respiratory Sinus Arrhythmia in Apnea Patients With Apnea Associated Comorbidities**
John Morales*, Margot Deviaene, Javier Milagro, Dries Testelmans, Bertien Buyse, Raquel Bailón, Sabine Van Huffel, Carolina Varon

PA1 Challenge Posters

- 249-50 **Effectiveness of a Convolutional Neural Network in Sleep Arousal Classification Using Multiple Physiological Signals**
Yinghua Shen*
- 250-126 **Detecting Cortical Arousals From Biological Signals Using Signal Processing and Neural Networks**
Guðni Fannar Kristjansson*, Heiðar Már Práinsson, Hanna Ragnarsdóttir, Bragi Marinósson
- 251-197 **Non-Apnea Arousal Detection Using Multiple-Biological Signals With Time and Frequency Domain Features**
Fatih Caglar, Emin Argun Oral*, Ibrahim Yucel Ozbek
- 252-104 **Detecting Respiratory Effort-Related Arousals in Polysomnographic Data Using a Time-Dependent Nearest-Neighbor Algorithm**
Sven Schellenberger*, Kilin Shi
- 253-135 **Modeling Temporal Dependencies With Long Short-Term Memory Networks for Sleep Arousal Detection**
Haozhu Wang*, Ian Fox, Sayan Ghosh, Jenna Wiens
- 254-226 **Automatic Detection of Respiratory Effort Related Arousals From Polysomnographic Recordings**
Ivan Lazić*, Danica Despotović, Nikša Jakovljević, Tatjana Lončar-Turukalo
- 255-230 **Knowledge Extraction of Physiological Signals Based on Deep Neural Networks: Arousals Case**
Edwar Macias Toro*, Antoni Morell Pérez, Javier Serrano Garcia, Jose Lopez Vicario
- 256-83 **A Linear Support Vector Machine-Based Sleep Arousal Detection Using Multiphysiological Signals**
Yizhou Zhong, Haoqi Li*, Qineng Cao

- 257-245 **SleepTight: Identifying Sleep Arousals Using Inter- and Intrarelation of Multimodal Signals**
Rohan Banerjee*, Tanuka Bhattacharjee, Anirban Dutta Choudhury, Deepan Das
- 258-217 **Sleep Arousal Classification Using Autoencoded Physiological Signals and Long Short-Term Memory**
Vyintas Maknickas*, Algirdas Maknickas
- 259-255 **Sleep Arousal Detection Through Support Vector Machine Subgradient Learning on Spectrographic Features**
Alexander Yee*
- 260-242 **Automatic Sleep Arousal Identification From Physiological Waveforms Using Deep Learning**
Daniel Miller*, Andrew Ward
- 261-264 **Identification of Sleep Arousal From Physiological Signals Using Machine Learning Classification Algorithms**
Vinodhini Ranganathan*, Abijeet Waghmare, Uma Maheshwari Krishnaswamy, Tony Raj
- 262-256 **Application of Convolutional Recurrent Neural Networks for the Prediction of Target Non-Apneic Arousal Regions in Physiological Signals**
Ashish Sharma, Abhay Upadhyay*
- 263-349 **Multitapered Spectral Point Process Models for Multimodal Sleep Arousal Detection**
Sandya Subramanian*, Shubham Chamadia, Leon Chlon
- 264-372 **An Automated Model for Classification of Sleep Arousal Episodes Using Support Vector Machine**
Shubha Majumder*, Chunwu Wang, Abdiaziz Mohamud, Ajay Verma
- 265-371 **Multiple Physiological Signals Based Classification of Sleep Arousal**
Jia Dongya*, Yan Cong, Wei Zhao, Yanwu Xu, Jing Hu, wang hongmei, Tianyuan You

- 266-363 **Automatic Sleep Arousal Detection by Multichannel Convolutional Neural Networks-Long Short-Term Memory**
Guanjie Huang*, Chao-Hsien Chu
- 267-368 **Sleep Arousal Detection From Polysomnography Using the Scattering Transform and Recurrent Neural Networks**
Philip Warrick*, Masun Nabhan Homsfi
- 268-262 **Arousal Detection in Multimodal Sleep Recordings Using Hidden Markov Models**
Fernando Andreotti*, Oliver Carr, Kirubin Pillay, Navin Cooray, Huy Phan, Maarten De Vos
- 269-152 **Deep Multimodal Framework Augmented With Feature-Based Approach for Automatic Detection of Arousals During Sleep**
Saman Parvaneh*, Jonathan Rubin, Ali Samadani, Adi Prakash, Gajendra Katuwal

PA2 HRV??? T7b

270-330 Age and Changes in Extracted Features of Lagged Poincare Plot

Shahab Rezaei, Sadaf Moharreri, Nader Jafarnia Dabanloo, Saman Parvaneh*

271-181 Can Peak-Picked ECG Be Used for Heart Rate Variability?

Richard Gregg*, Reza Firoozabadi, Saeed Babaeizadeh

272-205 Adding Two Dimensions to Heart Rate Variability Research

Joachim A. Behar*, Ori Shemla, Yael Yaniv

273-234 Use of Approximation Entropy for Stratification of Risk in Patients With Chagas Disease

Miguel Vizcardo*, Antonio Ravelo Garcia

274-312 Inhomogeneous Heart Rate Variability Spectral Complexity: A Preliminary Evaluation With Gravitational Stimuli Under Selective Autonomic Blockade

Bolea Juan, Gaetano Valenza*, Raquel Bailón, Esther Pueyo, Riccardo Barbieri

275-14 Detection of Driver's Drowsiness Using New Features Extracted From Heart Rate Variability Signal

Gholamreza Attarodi*, Sahar Matla Nikooei, Nader Jafarnia Dabanloo, Keivan Maghooli

PA3 Atrial Fibrillation 3b

- 276-11 **Classification Atrial Fibrillation Using Stacked Autoencoders Neural Networks**
Gholamreza Attarodi*, Javid Farhadi Sedehi, Nader Jafarnia Dabanloo
- 277-360 **Singular Spectrum Analysis of Atrial Activations Dominant Frequency to Predict Atrial Fibrillation Recurrence After Ablation Procedure**
Raquel Cervigón*, Javier Moreno, José Millet, Francisco Castells
- 278-365 **Prediction of Atrial Fibrillation Recurrence by Pulmonary Vein Electrogram Correlation**
Raquel Cervigón*, Javier Moreno, José Millet, Francisco Castells
- 279-221 **Action Potential Duration Restitution Kinetics During Atrial Fibrillation Derived From Optical Mapping Recordings in Goat**
Vladimir Sobota*, Stef Zeemering, Arne van Hunnik, Piotr Podziemski, Ulrich Schotten, Sander Verheule
- 280-147 **Detection of Atrial Fibrillation From Short ECGs: Minimalistic Complexity Analysis for Feature-Based Classifiers**
Anara Abdulkalikova, Denis Kleyko, Evgeny Osipov, Urban Wiklund*
- 281-395 **High Entropy Identifies Regions of Repetitive Wave Cross Propagation: Insights From Computational Simulation**
Dhani Dharmaprani*, Pawel Kuklik, Andrew McGavigan, Anand Ganesan
- 282-90 **A Novel Kernel-Based Method for Atrial Fibrillation Diagnosis**
Zouhair Haddi*, Bouchra Ananou, Stéphane Delliaux, Mustapha Ouladsine
- 283-201 **Application of Joint Notch Filtering and Wavelet Transform for Enhanced Powerline Interference Removal in Atrial Fibrillation Electrograms**
Miguel Martínez, Juan Ródenas, José J Rieta, Raul Alcaraz*

- 284-359 **Atrial Rotor Modulation by Localized Dofetilide Application: An In Silico Study**
Sandra Perez-Buitrago, Juan P Ugarte*, Catalina Tobon
- 285-306 **Functional Data Analysis for ECG Recordings of Paroxysmal Atrial Fibrillation Patients Before and After Pulmonary Vein Isolation**
Nuria Ortigosa*, Guillermo Ayala, Óscar Cano
- 286-66 **Automatic Identification of Atrial Fibrillation by Spectral Analysis of Fibrillatory Waves**
Agnese Sbröllini*, Krizia Cicchetti, Alessia De Martinis, Ilaria Marcantoni, Micaela Morettini, Laura Burattini
- 287-268 **A Robust Detection Method of Atrial Fibrillation**
Jing Hu*, Wei Zhao, Yanwu Xu, Jia Dongya, Yan Cong, wang hongmei, Tianyuan Uou
- 288-377 **Interactive Exploration of Left Atrium Population-Level Morphology in Atrial Fibrillation Patients**
Tim Sodergren*, Anupama Goparaju, Alan Morris, Evgueni Kholmovski, Nassir Marrouche, Joshua Cates, Shireen Elhabian
- 289-127 **Unsupervised k-Mean Classification of Atrial Electrograms From Human Persistent Atrial Fibrillation**
Tiago Paggi de Almeida*, Diogo C Soriano, Xin Li, Gavin S Chu, João L Salinet, Fernando S. Schlindwein, Peter J Stafford, G André Ng, Takashi Yoneyama
- 290-294 **The Effect of Beat Interval on Ventricular Repolarisation in Atrial Fibrillation**
Marwa Al-Karadi*, Antony J Wilkinson, Philip Langley
- 291-320 **Multiple P-Wave Morphologies in Paroxysmal Atrial Fibrillation Patients During Sinus Rhythm: A Simulation Study**
Dimitris Filos*, Paschalis Korosoglou, Dimitrios Tachmatzidis, Nicos Maglaveras, Vassilios Vassilikos, Ioanna Chouvarda

292-129 **Developing an Iterative Tracking Algorithm to Guide a Catheter Towards Atrial Fibrillation Rotor Sources in Simulated Fibrotic Tissue**

Prasanth Ganesan, Hussein Zilouchian, Elizabeth Cherry, Arkady Pertsov, Behnaz Ghoraani*

PA4 Cardiovascular Imaging T1

293-12 A Nonlinear Adaptive Level Set for Intravascular Ultrasound Images Segmentation

Nader Jafarnia Dabanloo*, Javid Farhadi Sedehi, Gholamreza Attarodi

294-76 A Temporal Area Variation Regularized Deep Learning Network for Left Ventricle Segmentation on Cardiac Magnetic Resonance

Gongning Luo*, Shaodong Cao, Kuanquan Wang, Henggui Zhang

295-361 Fetal Pulsed-Wave Doppler Atrioventricular Activity Detection by Envelope Extraction and Processing

Eleonora Sulas*, Emanuele Ortu, Monica Urru, Alessandra Cadoni, Roberto Tumbarello, Luigi Raffo, Danilo Pani

PA5 System Study 7a

- 296-341 **The NInFEA Dataset for Noninvasive Fetal Electrocardiography Research**
Eleonora Sulas*, Giulia Pili, Emanuele Ortu, Elisa Gusai, Monica Urru, Alessandra Cadoni, Roberto Tumbarello, Luigi Raffo, Danilo Pani
- 297-23 **Study of Blood Pressure During Controlled Respiration**
Alan Murray*, Masaki Hoshiyama
- 298-241 **Cardiovascular Function Analysis of Untreated Hypertensive and Normotensive Participants in Cardiopulmonary Exercise Test**
Yahui Zhang*, Zhihao Jiang, Lin Qi, Lisheng Xu, Xingguo Sun, Xinmei Chu, Yanling Liu, Stephen E Greenwald
- 299-307 **Approximate Entropy in Analysis of Cardiovascular Response to Lower Body Negative Pressure Test**
Agnieszka Strok, Gerard Cybulski*, Anna Gąsiorowska, Wiktor Niewiadomski
- 300-8 **Pattern-Segmented Heart Rate Variability Analysis During Fetal Maturation**
Alexander Schmidt*, Dirk Hoyer, Uwe Schneider
- 301-20 **A Lumped Parameter Model of Airway/Lung Mechanics**
Silvia Marconi, Claudio De Lazzari*
- 302-173 **Incoherent Synchronization Between Resting State Respiratory Sinus Arrhythmia and Respiratory Movement in Depressed Patients With Suicidal Ideation**
Ahsan Khandoker*, Veena Luthra, Yousef Abouallaban, Namareq Widadalla, Herbert F Jelinek, Kyuichi Niizeki, Leontios Hadjileontiadis
- 303-300 **Detrended Fluctuation Analysis of Heart and Respiratory Rhythm in Atrial Fibrillation**
Janko Zeković*, Šućro Madžgalj, Mirjana Platiša

304-328 Effects of Meditation on Heart Rate Stability

Masaki Hoshiyama*, Alan Murray

PA6 CV Mechanics ???

305-386 **Multiscale Modelling of Anthracycline Cardiotoxicity in Heart Contraction**

Alex Lewalle*, Steven Niederer

306-106 **A Method for Removing Pacing Artifacts From Ultra-High-Frequency Electrocardiograms**

Petr Andrla*, Filip Plesinger, Josef Halamek, Pavel Leinveber, Ivo Viscor, Pavel Jurak

307-142 **Comparison Between Theoretical and Experimental Reflection Coefficients in Flexible Tubes as a Function of the Mach Number**

Alessandro Giudici*, Wisam Hacham, Ashraf W Khir

308-22 **Modelling Effect of Heart Failure on the Electrical Activity of Sheep Atria**

Nouf Alshwaira*, Henggui Zhang

309-199 **Electro-Mechanical Delay in the Human Heart: A Study on a Simple Geometry**

Ekaterina Kovacheva*, Lukas Baron, Olaf Doessel, Axel Loewe

310-275 **Classification of Heart Sounds From Valve Disease Patients and Normal Subjects Using Recurrent Neural Networks**

Xingyao Wang, Chengyu Liu*

311-145 **Gyrocardiography: A Preliminary Investigation of Cardiac Timings**

Parastoo Dehkordi, Kouhyar Tavakolian*, Vahid Zakeri, Farzad Khosrow-Khavar

PA7 Medical Informatics & Technology

312-389 Early Identification of Drowsiness Using Pulse Arrival Time

Ajay Verma, Chunwu Wang, Bijay Guragain, Lewis Archer, Kouhyar Tavakolian*, Nicholas Wilson

313-269 Breathing Rate Estimation From the Photoplethysmography Using Respiratory Quality Indices

Soumaya Khreis*, Di Ge, Guy Carrault

314-72 Pay More Attention with Less Parameters: A Novel 1-D Convolutional Neural Network for Heart Sounds Classification

Yunqiu Xu*, Bin Xiao, Xiuli Bi, Weisheng Li, Junhui Zhang, Xu Ma

315-222 Feature-Based Cardiac Cycle Segmentation in Phonocardiogram Recordings

Jussi Taipalmaa, Morteza Zabihi*, Serkan Kiranyaz, Moncef Gabbouj

316-44 T-Wave Alternans Simulator: A Graphical User Interface for T-Wave Alternans

Micaela Morettini*, Lorenzo Marchesini, Luca Alberto Pettinari, Andrea Tigrini, Ilaria Marcantoni, Agnese Sbrollini, Laura Burattini

317-98 Towards Personalized Aortic Valve Prostheses - A Sparse Representation of the Individual Leaflet Shape

Jannis Hagenah*, Michael Scharfschwerdt, Floris Ernst

318-191 Effects of Microgravity on Action Potential Wave Propagation in Rat Transmural Ventricle Tissue

Xiangyun Bai*, Kuanquan Wang, Qince Li, Cunjin Luo, Yacong Li, Henggui Zhang

319-176 Evaluation of Three-Dimensional Accelerometers for the Study of Left Ventricular Contractility

Mireia Calvo*, Jean-Luc Bonnet, Maxime Lemonnier, Shota Yasuda, Wouter Oosterlinck, Alfredo Hernández

- 320-215 **Heartbeat Detection Using Three-Axial Seismocardiogram Acquired by Mobile Phone**
Federica Landreani*, Damien Golier, Amin Hossein, Jérémy Rabineau, Philippe Van de Borne, Enrico Caiani, Pierre-François Migeotte
- 321-121 **Electroanatomic Analysis Platform for Research and Development of Novel Complex Mapping Techniques in Electrophysiology**
Stephen Gaeta, Tristram Bahnson, Craig Henriquez*
- 322-316 **A Statistical Comparative Study of Photoplethysmographic Signals in Wrist-Worn and Fingertip Pulse-Oximetry Devices**
Kais Gadhouni*, Kevin Keenan, Rene Colorado, Karl Meisel, Xiao Hu

PA8 Tissue Modeling

323-35 Effect of Tissue Elasticity in Endocardial Radiofrequency Catheter Ablation Models

Argyrios Petras*, Massimiliano Leoni, Jose Guerra, Johan Jansson, Luca Gerardo-Giorda

324-280 Detailed Electromechanical Model of Ventricular Wedge

Alexander Kursanov*, Vladimir Zverev, Leonid Katsnelson, Olga Solovyova

325-353 Baseline Fluorescence Removal Optimized for Optical Mapping Measurements

ILIJA Uzelac*, flavio fenton

326-189 Comparison of Depolarization and Repolarization in Mathematical Models of the Left Ventricle and the Thin Longitudinal Ventricular Slice

Anastasia Bazhutina*, Anastasia Khokhlova, Konstantin Ushenin, Olga Solovyova

327-308 A Space-Fractional Monodomain Model Combining Tissue Anisotropy and Heterogeneity in Cardiac Electrophysiology

Luca Gerardo Giorda*, Nicole Cusimano

SB1 Whole Heart Modeling

328-161 A Multiscale Investigation of Global Electrical Heterogeneity: Effects of Body Habitus, Respiration, and Tissue Conductivity

Erick Andres Perez Alday*, Haibo Ni, Christopher Hamilton, Annabel Li-Pershing, Bernard Jaar, Jose M Monroy-Trujillo, Michelle Estrella, Rulan Parekh, Henggui Zhang, Larisa Tereshchenko

329-79 Predicting Activation Patterns in Cardiac Resynchronization Therapy Patients

Angela Lee*, Uyen Chau Nguyen, Justin Gould, Baldeep Sidhu, Benjamin Sieniewicz, Frits Prinzen, Gernot Plank, Christopher Rinaldi, Kevin Vernoooy, Steven Niederer

330-271 T-Wave Changes Due to Cardiac Deformation Are Dependent on the Temporal Relationship Between Repolarization and Diastolic Phase

Robin Moss*, Eike Moritz Wülfers, Gunnar Seemann

SB2 Sleep and Autonomic Nervous System

331-357 Sensitivity Analysis of a Cardiorespiratory Model for the Study of Responses to Apnea

Gustavo Guerrero*, Virginie Le Rolle, Alfredo Hernandez

332-175 Investigating Sleep Fragmentation by Autonomic Arousals in Depressed Patients With Obstructive Sleep Apnea

Ahsan Khandoker*, Leontios Hadjileontiadis, Noura Sayed, Reem Alneyadi, Fatima Ba Fakhri, Fatima Alshamsi, Khulood Alameri, Seada Kassie, Taoufik Alsaadi

333-192 The Cardiorespiratory Graph in Sleep Apnea and Associated Comorbidities

Carolina Varon*, Margot Deviaene, Dries Hendrikx, Sara Van de Putte, Dries Testelmans, Bertien Buyse, Sabine Van Huffel

334-21 Analysis of U-Shape Patterns in RR-Interval Time Series During Sleep

Sasan Yazdani*, Alexandre Cherqui, Nicolas Bourdillon, Gregoire Millet, Jean-Marc Vesin

SB3 Ventricular Arrhythmias: Detection and Ablation

335-37 Fast Detection of Ventricular Tachycardia and Fibrillation in 1-Lead ECG from 3-Second Blocks

Filip Plesinger*, Petr Andrla, Ivo Viscor, Josef Halamek, Pavel Jurak

336-338 Man vs. Machine: Comparison of Manual vs. Novel 12-Lead ECG Algorithm to Predict the Ventricular Arrhythmia Origin to Guide Ablation Procedure

Roger Abächerli*, Ramin Ebrahimi, Peter van Dam, Ivo Strebler, Tobias Reichlin

337-208 Optimization of a Novel Activation-Repolarization Metric to Identify Targets for Catheter Ablation

Fernando Campos*, Michele Orini, Ben Hanson, Pier Lambiase, Bradley Porter, Christopher Aldo Rinaldi, Jaswinder Gill, Peter Taggart, Martin Bishop

338-388 Electromechanical Vortex Filaments During Cardiac Fibrillation

Jan Christoph*, Flavio Fenton, Stefan Luther

SB4 Analysis of Ischemia

339-351 Novel Metric for Evaluating Ischemic Stress on the Torso Surface Using Laplacian Eigenmaps on Animal and Human Recordings

Wilson Good*, Burak Ereğ, Jaume Coll-Font, Brian Zenger, Dana Brooks, Rob MacLeod

340-253 ST Segment Change Classification Based on Multiple Feature Extraction Using ECG

wang hongmei*, Wei Zhao, Yanwu Xu, Jing Hu, Yan Cong, Jia Dongya, Tianyuan You

341-18 Temporal Beat-to-Beat Variability of Repolarization Changes Predict Nonsustained Ventricular Tachycardia in Ischemic Heart Disease Patients

Jonathan Moeyersons*, Matthew Amoni, Bert Vandenberg, Carolina Varon, Karin Sipido, Sabine Van Huffel, Rik Willems

342-305 Electrocardiographic Comparison of Dobutamine and Bruce Cardiac Stress Testing With High Resolution Mapping in Experimental Models

Brian Zenger*, Wilson Good, Rob MacLeod

MD Closing Plenary

- 343-39 **Assessing a Warping Methodology for the Identification of Increased Cardiovascular Risk Based on the HR Profile Morphology**
Julia Ramírez*, Stefan van Duijvenboden, Pablo Laguna, Esther Pueyo, Andrew Tinker, Pier Lambiase, Patricia Munroe, Michele Orini
- 344-346 **Acute Effects of Respiratory-Gated Auricular Vagal Afferent Nerve Stimulation in the Modulation of Blood Pressure in Hypertensive Patients**
Harrison Fisher*, Jessica Stowell, Ronald Garcia, Roberta Sclocco, Jill Goldstein, Vitaly Napadow, Riccardo Barbieri
- 345-288 **On Deriving Tidal Volume From Electrocardiogram During Maximal Effort Test**
Javier Milagro*, David Hernando, Jesus Lazaro, José Antonio Casajús, Nuria Garatachea, Eduardo Gil, Raquel Bailón
- 346-112 **Personalised Modelling Pipeline for Cardiac Electrophysiology Simulations of Infarct Patients**
Caroline Mendonca Costa*, Aurel Neic, Gernot Plank, Eric Kerfoot, Bradley Porter, Benjamin Sieniewicz, Justin Gould, Baldeep Sidhu, Zhong Chen, Christopher A. Rinaldi, Martin J. Bishop, Steven A. Niederer