

# **2023 Computing in Cardiology (CinC 2023)**

**Atlanta, Georgia, USA  
1-4 October 2023**

**Pages 1-602**



**IEEE Catalog Number: CFP23CAR-POD  
ISBN: 979-8-3503-5903-9**

**Copyright © 2023, CinC  
All Rights Reserved**

**Individual articles in this volume are copyright (C) 2023 by their respective authors,  
and licensed by their authors under the Creative Commons Attribution 4.0  
International License. (CCAL).**

***\*\*\* This is a print representation of what appears in the IEEE Digital  
Library. Some format issues inherent in the e-media version may also  
appear in this print version.***

IEEE Catalog Number:	CFP23CAR-POD
ISBN (Print-On-Demand):	979-8-3503-5903-9
ISBN (Online):	979-8-3503-8252-5
ISSN:	2325-8861

**Additional Copies of This Publication Are Available From:**

Curran Associates, Inc  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: (845) 758-0400  
Fax: (845) 758-2633  
E-mail: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

## TABLE OF CONTENTS

Identifying Noisy ECG Signals in Large Datasets Using a Temporal Convolutional Neural Network Trained to Estimate Pseudo-SNR .....	1
<i>Peter Doggart, Alan Kennedy, Daniel Guldenring, Raymond Bond, Dewar Finlay</i>	
Epycon: A Single-Platform Python Package for Parsing and Converting Raw Electrophysiology Data into Open Formats.....	5
<i>Jakub Hejc, Richard Redina, Jana Kolarova, Zdenek Starek</i>	
Heart Rate Variability Differentiates Between Vasovagal Syncope and Palpitation Related Fainting .....	9
<i>David J Cornforth, Shiza Saleem, Helmut Ahammer, Robert Krones, Dominik Wehler, Herbert F Jelinek</i>	
A Comparison of Methodologies for Pulmonary Veins Segmentation in High Definition Voltage Maps of Patients with Atrial Fibrillation .....	13
<i>Leire Moriones, Iker González, Blas Echebarria, Susana Ravassa, Javier Ibero, Ignacio García-Bolao, Jean Bragard</i>	
Heterogeneity Quantification of Electrophysiological Signal Propagation in High-Density Multielectrode Recordings .....	17
<i>Lucía Pancorbo, Samuel Ruipérez-Campillo, Francisco Castells, José Millet</i>	
In Silico Assessment of Arrhythmic Risk in Infarcted Ventricles Engrafted with Engineered Heart Tissues .....	21
<i>Ricardo M Rosales, Konstantinos A Mountris, Manuel Doblaré, Manuel M Mazo, Esther Pueyo</i>	
A Method with Time-Sensitive Features for the Automated Prognosis Prediction of Cardiac Arrest Patients Based on EEG.....	25
<i>Siying Li, Yonggang Zou, Xianya Yu, Xiuying Mou, Yueqi Li, Bokai Huang, Changyu Liu, Xianxiang Chen</i>	
Action Potential Clamp as a Tool for Risk Stratification of Sinus Bradycardia Due to Loss-Of-Function Mutations in HCN4 .....	29
<i>Arie O Verkerk, Ronald Wilders</i>	
Predicting Neurological Outcome After Cardiac Arrest Using a Pretrained Model with Electroencephalography Augmentation.....	33
<i>Dong-Kyu Kim, Hong-Cheol Yoon, Hyun-Seok Kim, Woo-Young Seo, Sung-Hoon Kim</i>	
Wearable Photoplethysmography: Current Status and Future Challenges.....	37
<i>Peter H Charlton, Panicos A Kyriacou</i>	
Autonomic Control and Baroreflex Sensitivity Before and After Transcatheter Aortic Valve Implantation.....	41
<i>Vlasta Bari, Francesca Gelpi, Beatrice Cairo, Martina Anguissola, Sara Pugliese, Beatrice De Maria, Elena Acerbi, Mattia Squillace, Marco Ranucci, Francesco Bedogni, Alberto Porta</i>	
Causal Squared Coherence Analysis to Estimate Cardiorespiratory Coupling in Athletes.....	45
<i>Raphael M Abreu, Beatrice Cairo, Vlasta Bari, Aparecida M Catai, Patrícia Rehder-Santos, Francesca Gelpi, Alberto Porta</i>	

Fetal Arrhythmia: Deep Learning and Clustering Techniques, Analysis Through Permutation Entropy and Genetic Algorithms in Its Early Diagnosis.....	49
<i>Zayd Isaac Valdez, Luz Alexandra Díaz, Antonio G Ravelo-García, Miguel Vizcardo Cornejo</i>	
An Optimization Approach to EEG Feature Extraction for the Prediction of Neurological Outcome .....	53
<i>Allan R Moser, Jackie T Le, Lys K P Kang</i>	
Electrotonic Coupling Effect on Pharmacological Cardiotoxicity Assessment in Atrial Tissue.....	57
<i>Matteo Costi, Isabella Della Torre, Jose Maria Ferrero, Jose Felix Rodriguez Matas</i>	
Comparison of Machine Learning and Deep Learning Methods Based on Recurrence Analysis for Obstructive Sleep Apnea Detection.....	61
<i>Daniele Padovano, Arturo Martínez-Rodrigo, Jose M Pastor, Jose J Rieta, Raul Alcaraz</i>	
A Tensor Decomposition-Based Feature Extraction Method to Predict Neurological Recovery from Coma After Cardiac Arrest Using EEG Signals .....	65
<i>Shivnarayan Patidar, Nidhi Kalidas Sawant</i>	
Heart Attack Outcome Predictions Using FMM Models.....	69
<i>C. Canedo, A. Fernández-Santamónica, Y. Larriba, I. Fernández, C. Rueda</i>	
Hermite Based Parametric Representation of Magnetohydrodynamic Effect for the Generation of Synthetic ECG Signals During Magnetic Resonance Imaging.....	73
<i>Pierre G Aublin, Jacques Felblinger, Julien Oster</i>	
Sinoatrial Node Cell Response to Isoprenaline Stimulation and Hypocalcemia .....	77
<i>Tomas Stary, Moritz Linder, Axel Loewe</i>	
EGM Reconstruction from BSPs in Atrial Fibrillation Using Deep Learning.....	81
<i>Miriam Gutiérrez-Fernández, Miguel Ángel Cámará-Vázquez, Ismael Hernández-Romero, Carlos Fambuena-Santos, María S Guillem, Andreu M Climent, Óscar Barquero-Pérez</i>	
Left Bundle Branch Area Pacing Generates More Physiological Ventricular Activation Sequences than Right Ventricular Pacing.....	85
<i>Clara Sales, Ana Mincholé, Jorge Melero-Polo, Mercedes Cabrera-Ramos, Isabel Montilla-Padilla, Laura Sorinas, Ines Julián, Esther Pueyo, Javier Ramos</i>	
Predicting Neurological Outcomes of Comatose Cardiac Arrest Patients Using Transformer Neural Networks with EEG Data .....	89
<i>Jefferson Dionisio, Che Lin, Lian-Yu Lin, Wen-Chau Wu</i>	
Choosing Electrogram Features for Predicting Catheter Ablation Outcomes in Persistent Atrial Fibrillation.....	93
<i>Noor Qaqos, Fernando S Schlindwein, G André Ng, Xin Li</i>	
Novel In-Home Cardiac Monitoring for Heart Failure Patients .....	97
<i>Bipin Lekhak, Ryan Missel, Dillon Dzikowicz, Solomiya Rachynska, Wojciech Zareba, Linwei Wang</i>	
Predicting Neurological Recovery from Coma with Longitudinal Electroencephalogram Using Deep Neural Networks .....	101
<i>Jingsu Kang, Hao Wen</i>	
Prediction Comatose Patient Outcomes Using Deep Learning -Based Analysis of EEG Power Spectral Density .....	105
<i>Kyungmin Choi, Gi-Won Yoon, Sanghoon Choi, Hyeyoung Choi, Segeyeong Joo</i>	

Predicting Neurological Recovery Following Coma After Cardiac Arrest Using the R(2+1)D Network Based on EEG Signals .....	109
<i>Meng Gao, Rui Yu, Zhuhuang Zhou, Shuicai Wu, Guangyu Bin</i>	
Deployment of an On-The-Edge Clinical Decision Support System in Neonatal Intensive Care Units .....	113
<i>Meng Chen, Alain Beuchée, Fabrice Tudoret, Arnaud Coursin, Pheng Ho, Alfredo I Hernández</i>	
Influence of the Training Set Composition on the Estimation Performance of Linear ECG-Lead Transformations .....	117
<i>Daniel Guldenring, Dewar D Finlay, Raymond R Bond, Alan Kennedy, Peter Doggart, Ghalib Janjua, James McLaughlin</i>	
A Fully Automated Two-Stage Segmentation Approach for Late Gadolinium-Enhanced Cardiac Magnetic Resonance Images in Personalized Cardiac Modeling .....	121
<i>Yutong Sun, Shiwei Lu, Chongshang Zhao, Yanqiu Feng, Wufan Chen, Ling Xia, Dongdong Deng</i>	
Automatic Detection of Acoustic Window During Echocardio-Graphic Imaging .....	125
<i>Martin S Andersen, Johannes J Struijk, Samuel E Schmidt</i>	
Complex Correlation Method Identifies Efficacy of One-Week Mindfulness Training in College Students .....	129
<i>Fatimah M Alani, Shiza Saleem, Bayan S. Obeid, Yasser O Kassar, Nadia Rabeh, Carl H Kassab, Rajan R K Prasad, Herbert F Jelinek, Zakia Dimassi</i>	
Optimized Blood Pressure Classification by Features of Pulse Rate Variability and Asymmetry .....	133
<i>Aikaterini Vraka, Vicente Bertomeu-González, Aurelio Quesada, Roberto Zangróniz, Raúl Alcaraz, José J Rieta</i>	
Estimation of Quiet Sleep in Preterm and Full-Term Newborns Using Machine Learning Algorithms Based on Cardio-Respiratory and Motion Signals .....	137
<i>Houda Jebbari, Sandie Cabon, Patrick Pladys, Guy Carrault, Fabienne Porée</i>	
Detection of Hypertension Through Features from Heart Rate Variability and Machine Learning Analysis .....	141
<i>Aikaterini Vraka, Lorenzo Fácila, Fernando Hornero, Arturo Martínez-Rodrigo, Raúl Alcaraz, José J Rieta</i>	
Evaluating Electrograms Domain Knowledge for Enhancing Catheter Ablation Outcomes Based on Time Series Features .....	145
<i>Noor Qaqos, Fernando S Schlindwein, G André Ng, Xin Li</i>	
Chagas Disease: An Analysis with Temporal Features Extraction, Permutation Entropy and a Stratification of Heart Risk by a Deep Learning Model .....	149
<i>Zayd Isaac Valdez, Luz Alexandra Díaz, Antonio G Ravelo-García, Miguel Vizcardo Cornejo</i>	
Cross-Domain Detection of Pulmonary Hypertension in Human and Porcine Heart Sounds .....	153
<i>Alex Gaudio, Noemi Giordano, Miguel Coimbra, Benedict Kjaergaard, Samuel Schmidt, Francesco Renna</i>	
Electrocardiography-Based Assessment of Cardiac Contractility .....	157
<i>Mously D Diaw, Idriss Ngomseu Tchoupe, Stéphane Papelier, Alexandre Durand-Salmon, Jacques Felblinger, Julien Oster</i>	

Role of Fiber Direction and Ionic Heterogeneities in Atrial Arrhythmia Simulations.....	161
<i>Javier Barrios Álvarez De Arcaya, María Termenón Rivas, Giada Sira Romitti, Rafael Sebastián, Alejandro Liberos, Miguel Rodrigo</i>	
Exploring EEG Signal Features for Predicting Post Cardiac Arrest Prognosis .....	165
<i>Antonio G C Santos, Joao A L Marques, Luís O Rigo, João P V Madeiro</i>	
In-Silico Trials Guide Optimal Stratification of Atrial Fibrillation Patients to Catheter Ablation Vs Pharmacological Medication: The i-STRATIFICATION Study.....	169
<i>Albert Dasí, Claudia Nagel, Leto L Riebel, Michael Tb Pope, Rohan S Wijesurendra, Tim R Betts, Axel Loewe, Alfonso Bueno-Orovio, Blanca Rodriguez</i>	
Effects of Beta Blocker Therapy on RR Interval Correlations During Exercise .....	174
<i>Teemu Pukkila, Matti Molkkari, Matias Kannainen, Jussi Hernesniemi, Kjell Nikus, Leo-Pekka Lyytikäinen, Terho Lehtimäki, Jari Viik, Mika Kähönen, Esa Räsänen</i>	
Quantifying Alterations Over Time in ST-Segment/T-Wave Amplitudes During Elective Percutaneous Coronary Intervention .....	178
<i>Philip Hempel, Theresa Bender, Ennio Idrobo-Avila, Henning Dathe, Dagmar Krefting, Tim Kacprowski, Nicolai Spicher</i>	
Comparison of Two Formulations for Computing Body Surface Potential Maps .....	182
<i>Emma Lagracie, Lisl Weynans, Yves Coudière</i>	
A Convolutional Neural Network Approach for Interpreting Cardiac Rhythms from Resuscitation of Cardiac Arrest Patients.....	186
<i>Trygve Eftestøl, Mari A Hognestad, Sander A Søndeland, Ali Bahrami Rad, Elisabete Aramendi, Lars Wik, Jo Kramer-Johansen</i>	
An Ensemble of Machine Learning Models for Multilabel Classification of Cardiovascular Diseases by ECGs .....	190
<i>Anastasia Bazhutina, Svyatoslav Khamzin, Alexander Sinitca, Mikhail Chmelevsky, Stepan Zubarev, Margarita Budanova, Werner Rainer</i>	
Characterising RR Intervals in Atrial Fibrillation Detected Through Screening .....	194
<i>Rayo Akande, James Brimcombe, Martin R Cowie, Andrew Dymond, Hannah Clair Lindén, Gregory Y H Lip, Jenny Lund, Jonathan Mant, Madhumitha Pandiaraja, Emma Svennberg, Kate Williams, Peter H Charlton, Peter Charlton</i>	
MMCTNet: Multi-Modal Cony-Transformer Network for Predicting Good and Poor Outcomes in Cardiac Arrest Patients .....	198
<i>Xiuli Bi, Shizhan Tang, Zonglin Yang, Xin Deng, Bin Xiao, Pietro Liò</i>	
Estimating Respiratory Modulation in Atrial Fibrillation Using a Convolutional Neural Network .....	202
<i>Felix Plappert, Mikael Wallman, Pyotr G Platonov, Frida Sandberg</i>	
Characterizing the Progression of Pulmonary Edema Severity: Can Pairwise Comparisons in Radiology Reports Help? .....	206
<i>Stephanie M Hu, Steven Horng, Seth J Berkowitz, Ruizhi Liao, Rahul G Krishnan, Li-Wei H Lehman, Roger G Mark</i>	
Defining the Predictive Ceiling of Electrogram Features Alone for Predicting Outcomes from Atrial Fibrillation Ablation .....	210
<i>Maxime Pedron, Prasanth Ganeshan, Ruibin Feng, Brototo Deb, Hui Chang, Samuel Ruiperez-Campillo, Sulaiman Somani, Yaanik Desai, Albert J Rogers, Paul Clopton, Sanjiv M Narayan</i>	

Sport DB 2.0: A New Database of Data Acquired by Wearable and Portable Devices While Practicing Sport .....	214
<i>Sofia Romagnoli, Agnese Sbrollini, Antonio Nocera, Micaela Morettini, Ennio Gambi, Danilo Bondi, Tiziana Pietrangelo, Vittore Verratti, Laura Burattini</i>	
The Effect of Missing Data When Predicting Readmission in Heart Failure Patients.....	218
<i>Filip Plesinger, Zuzana Koscova, Eniko Vargova, Jan Pavlus, Radovan Smisek, Ivo Viscor, Veronika Bulkova</i>	
Infarct-Related Myocardial Regions with Functional Relevance During Pacing and Ventricular Tachycardia Show Similar Underlying Substrate .....	222
<i>Alba Ramos-Prada, Jorge G Quintanilla, Andrés Redondo-Rodríguez, Jose Manuel Alfonso-Almazán, Daniel Enríquez-Vázquez, Javier Sánchez-González, David Filgueiras-Rama</i>	
An Analysis of Cavitation in Sonothrombolysis Through Convolutional Neural Networks .....	226
<i>Patricia A S Guenkawa, Sergio S Furue</i>	
Time-Embedded EEG Sequence Learning for Comatose Patients' Prognosis.....	230
<i>Simanto Saha, Raquib-Ul Alam, Andrea Samore, Andrew Goodwin, Michael Loong-Siong Wong, Alistair McEwan, Collin Anderson</i>	
Non-Invasive Estimation of Atrial Fibrosis Location and Density.....	234
<i>Maria Macarulla-Rodríguez, Jorge Sánchez, María S Guillem</i>	
Representation of the Cardiac Electrical Activity in the Form of a Double Layer Potential .....	238
<i>Vitaly Kalinin, Alexander Shlapunov</i>	
Comparison of a Discrete-Cell and Dointinuum Model of Two-Dimensional Ventricular Tissues Under Modulation of Cx43 .....	242
<i>Shengzhe Li, Danya Agha-Jaffar, Dimitrios Panagopoulos, Konstantinos Ntagiantas, Ariana J F Hawkins, Liliang Wang, Prapa Kanagaratnam, Rasheda A Chowdhury, Chris D Cantwell, Chris D Cantwell</i>	
Modeling Gender Differences in Heart Rate During the Diving Reflex: Insights into Physiological Adaptability .....	246
<i>M Rey-Paredes, O Barquero-Pérez, R Goya-Esteban, A Luque-Casado, D Grassi, F Suárez</i>	
Simultaneous Recording of Electrical and Panoramic Optical Mapping from Ex-Vivo Isolated Rabbit Hearts: from Sinus Rhythm to Induced Arrhythmia .....	250
<i>J Siles, I Uzelac, V Silva, I Sandoval, G Weber, J Salinet</i>	
Paradigm Shift from Feature-Based Machine Learning to End-to-End Deep Residual Neural Networks for Pediatric Age Classification from 12-Lead ECG.....	254
<i>Junmo An, Ben Bailey, Richard E Gregg</i>	
Study on the Generalization Ability of Accelerometer Threshold-Based Methods for Noise Detection in PPG Signals .....	258
<i>S Mula, R Zangróniz, J J Rieta, R Alcaraz</i>	
A Statistical Comparison of Heart Rate Variability Measurements Between Devices: Chest Strap Versus Finger Probe.....	262
<i>Mehri Bagheri-Mohamadi-Pour, Rodney Sparapani, Jun Zhang, Jacquelyn Kulinski</i>	
Dynamic Changes of Pulmonary Veins Ostia in Controls and Atrial Fibrillation Patients.....	266
<i>Matteo Falanga, Giulio Molon, Carmelo Cicciò, Stefano Bonapace, Cristiana Corsi</i>	

Automatic Classification Normal ECGs Based on Normal PathECG and WaveECG Features .....	270
<i>Elzbieta Pociask, Krzysztof P Malinowski, Mhd Jafar Mortada, Klaudia K Proniewska, Peter M Van Dam</i>	
Predicting Neurological Outcomes for Cardiac Arrest Patients from Longitudinal EEG Based on Short-Time Fourier Transform and 3-D Deep Residual Network .....	274
<i>Pan Xia, Dongfang Zhao, Yicheng Yao, Zhongrui Bai, Yizi Shao, Saihu Lu, Fanglin Geng, Yusi Zhu, Peng Wang, Lidong Du</i>	
Instantaneous Time-Courses of Baroreflex Sensitivity, Sympathetic and Vagal Activities in Response to Mueller Maneuver .....	278
<i>Salvador Carrasco-Sosa, Alejandra Guillén-Mandujano</i>	
Model Ensembling for Predicting Neurological Recovery After Cardiac Arrest: Top-Down Or Bottom-Up? .....	282
<i>Hongliu Yang, Ronald Tetzlaff</i>	
Utilizing 3D Additive Manufacturing to Develop a Biocompatible, Customizable, and Durable Mechanical Aortic Valve .....	286
<i>Aadi Bhensdadia</i>	
Autoencoder Artefact Removal for Brain Signals and Impact on Classification Performance .....	290
<i>Mengyao Li, Le Xing, Alexander J Casson</i>	
Prediction of Stroke Diagnosis Through a Classification Model Based on Cerebral Autoregulation: A Preliminary Study .....	294
<i>R Romanelli, Asm Salinet, Rc Nogueira, J Salinet</i>	
Influence of Chest Compression on Amplitude Spectrum Area for the Prediction of the Return of Spontaneous Circulation in a Pediatric Swine Model .....	298
<i>Luiz Eduardo V Silva, Hunter A Gaudio, Nicholas J Widmann, Rodrigo M Forti, Viveknarayanan Padmanabhan, Kumaran Senthil, Julia C Slovis, Constantine D Mavroudis, Yuxi Lin, Lingyun Shi, Wesley B Baker, Ryan W Morgan, Todd J Kilbaugh, Fuchiang Rich Tsui, Tiffany S Ko</i>	
Assessing Autonomic Nervous System Imbalance in Post-COVID-19 Patients Through Heart Rate Variability During Tilt Testing .....	302
<i>Samuel M Camargo, Beatriz M Silva, Matheus W U Pereira, Ana L G Dos Santos, Stella T Maximo, William T Watanabe, José L Puglisi, Daniel G Goroso</i>	
Injecting Domain Knowledge in Deep Learning Models for Automatic Identification of Myocardial Infarction from Electrocardiograms .....	306
<i>Silvia Ibrahimi, Massimo W Rivolta, Roberto Sassi</i>	
Cerebral Autoregulation in Transcatheter Aortic Valve Implantation Patients .....	310
<i>Francesca Gelpi, Vlasta Bari, Beatrice Cairo, Sara Pugliese, Martina Anguissola, Beatrice De Maria, Elena Acerbi, Mattia Squillace, Marco Ranucci, Francesco Bedogni, Alberto Porta</i>	
Deep-Learning-Assisted Prediction of Neurological Recovery from Coma After Cardiac Arrest .....	314
<i>Vasanth Kumar Babu, Navneet Roshan, Rahul Pandit</i>	
Atrial Features-Based Prediction of Sinus Tachycardia Using LSTM-RNN Model .....	318
<i>N Prasanna Venkatesh, R Pradeep Kumar, Bala Chakravarthy Neelapu, Kunal Pal, J Sivaraman</i>	

Wearable-Derived Long-Term Heart Rate Variability Predicts Major Adverse Cardiovascular Events in Middle Aged Individuals Without Previous Cardiovascular Disease .....	322
<i>Michele Orini, Jose-Luis Flores, Nishi Chaturvedi, Alun Hughes</i>	
Reconstructing Cardiac Voltage Using Data Assimilation: Effects of Observation Distribution .....	326
<i>Shoale Badr, Flavio H Fenton, Elizabeth M Cherry</i>	
Arrhythmogenic Sites Mapping in Post-Ischemic Ventricular Tachycardia Using a Siamese Neural Network.....	330
<i>Andrea Pitzus, Giulia Baldazzi, Luigi Raffo, Graziana Viola, Danilo Pani</i>	
Hybrid Scattering Transform - Long Short-Term Memory Networks for Intrapartum Fetal Heart Rate Classification.....	334
<i>Derek Kweku Degbedzui, Michael Kuzniewicz, Cornet Marie-Coralie, Yvonne Wu, Heather Forquer, Lawrence Gerstley, Emily Hamilton, Doina Precup, Philip Warrick, Robert Kearney</i>	
Detecting Preload Changes Using Seismocardiography.....	338
<i>Ahmad Agam, Peter Søgaard, Charlotte Burup Kristensen, Rasmus Mogelvang, Samuel Emil Schmidt</i>	
Deep Learning-Based Signal Quality Assessment in Wearable ECG Monitoring.....	343
<i>Caiyun Ma, Zhongyu Wang, Lina Zhao, Xi Long, Rik Vullings, Ronald M Aarts, Jianqing Li, Chengyu Liu</i>	
An Explainable AI Predictor to Improve Clinical Prognosis for Acute Respiratory Distress Syndrome .....	347
<i>Songlu Lin, Meicheng Yang, Yuzhe Wang, Zhihong Wang</i>	
Sensitivity Analysis of a Cardio-Respiratory Model for Pulse Transit Time.....	351
<i>Arthur Ben-Tolila, Virginie Le Rolle, Alfredo I Hernández</i>	
A 3D Electromechanical Model of the Human Atria: A Realistic Framework for the Study of Atrial Fibrillation.....	355
<i>Eva Casoni, Constantine Butakoff, Jazmin Aguado-Sierra, Violeta Puche, Beatriz Trenor, Javier Saiz, Mariano Vazquez</i>	
Left Atrial Appendage Contraction Analysis: A Preliminary Test on Atrial Fibrillation Patients.....	359
<i>Sachal Hussain, Matteo Falanga, Alessandro. Dal Monte, Corrado Tomasi, Cristiana Corsi</i>	
A Grid Search of Fibrosis Thresholds for Uncertainty Quantification in Atrial Flutter Simulations.....	363
<i>Benjamin A Orkild, Jake A Bergquist, Eric N Paccione, Matthias Lange, Eugene Kwan, Bram Hunt, Rob S Macleod, Akil Narayan, Ravi Ranjan</i>	
Transfer Learning for Improved Classification of Drivers in Atrial Fibrillation .....	367
<i>Bram Hunt, Eugene Kwan, Tolga Tasdizen, Jake Bergquist, Matthias Lange, Benjamin Orkild, Robert S Macleod, Derek J Dosdall, Ravi Ranjan</i>	
Two Approaches for Inverse PVC Localization from Clinical ECG Data Using Heart Surface Potentials .....	371
<i>Jana Svehlikova, Nika Rasoolzadeh, Beata Ondrusova, Peter Hlivak, Yesim Serinagaoglu Dogrusoz</i>	
Analysis of the Contribution of Cardiovascular Compartments to the Ballistocardiogram Signal Using Mathematical Modeling .....	375
<i>Mohamed Zaid, Raul Invernizzi, Lorenzo Sala, Laurel Despins, Mihail Popescu, James Keller, Marjorie Skubic, Riccardo Sacco, Marcela Szopos, Virginia H. Huxley, Giovanna Guidoboni</i>	

Whole Heart Simulation of Severe Aortic Stenosis Using a Lumped Parameter Model of Heart Valve Dynamics..... <i>Tobias Gerach, Jonathan Krauß, Steffen Schuler, Axel Loewe</i>	379
Robust Peak Detection for Photoplethysmography Signal Snalysis..... <i>Márton Á Goda, Peter H Charlton, Joachim A Behar</i>	383
Multicomponent Organization Analysis in Spatial Domains of Atrial Fibrillation ..... <i>Francisco M Melgarejo-Meseguer, Amanda Román-Román, Javier Gimeno-Blanes, Sergio Muñoz-Romero, Arcadi García-Alberola, Juan José Sánchez-Muñoz, Omer Berenfeld, José Luis Rojo-álvarez</i>	387
High-Dimensional Feature Characterization of Single Nucleotide Variants in Hypertrophic Cardiomyopathy ..... <i>Dafne Lozano, Luis Bote, Concha Bielza, Pedro Larrañaga, María Sabater, Juan Ramón Gimeno, Sergio Muñoz, Francisco Javier Gimeno, José Luis Rojo</i>	391
The Impact of Electrogram Type and Conduction Velocity Estimation Techniques on Assessments of Conduction Velocity During Ventricular Substrate Mapping ..... <i>Mahmoud Ehnesh, Johanna Tonko, Alexander M. Zolotarev, Edward J Vigmond, Pier D Lambiase, Caroline Roney</i>	395
3D CNN as an Approach to Predict the Cerebral Performance of Comatose Patients ..... <i>Rafael Teodoro Ors-Quixal, Elisa Ramírez-Candela, Samuel Ruipérez-Campillo, Francisco Castells-Ramón, José Millet</i>	399
Synthetic Seismocardiography Signal Generation by a Generative Adversarial Network ..... <i>James Skoric, Yannick D'Mello, David V Plant</i>	403
Recovery from Coma After Cardiac Arrest: Which Time-Window Counts the Most for Deep Learning Predictions? ..... <i>Filippo Uslenghi, Roberto Sassi, Massimo W Rivolta</i>	407
Fusion of Features with Neural Networks for Prediction of Secondary Neurological Outcome After Cardiac Arrest..... <i>Philip Hempel, Philip Zaschke, Miriam Goldammer, Nicolai Spicher</i>	411
Monitoring Stress Using Electrocardiogram Signal ..... <i>Sapnil Sarker Bipro, Sumaiya Kabir, Mohammad Abdul Motin</i>	415
An Efficient Linear Phase High-Pass Filter for ECG ..... <i>Richard E Gregg, Junmo An, Ben Bailey, Salah S Al-Zaiti</i>	419
Performance of Noncontact Video-Based Detection of Pulse Rate and Atrial Fibrillation on the iOS Platform..... <i>Gill R Tsouri, Alex Page, Margot Lutz, Jean-Philippe Couderc</i>	423
Optogenetic Modulation of GtACR1 on Myocardial Electromechanical Properties: A Computational Study ..... <i>Heqing Zhan, Zefeng Wang, Chuan'An Wei, Jialun Lin</i>	427
Introducing the Electromechanical Risk Factor Score Derived from Seismocardiography for Estimating the Likelihood of Coronary Artery Disease..... <i>Parastoo Dehkordi, Kouhyar Tavakolian, Zhen G Xiao, Farzad Khosrow-Khavar</i>	431

A Combinatorial Algorithm to Detect Higher-Order Dynamics in Cardiac Signals.....	435
<i>Shahriar Iravanian, Mikael J Toye, Ilijia Uzelac, Neal K Bhatia, Elizabeth M Cherry, Flavio H Fenton</i>	
Baseline Drifting Correction for Automated MTWA Measurements .....	439
<i>T Winkert, P R Benchimol-Barbosal, J Nadal</i>	
Mechanosensitive Channel Piezo1 in R403Q Hypertrophic Cardiomyopathy: A Computational Study.....	443
<i>Mohamadamin Forouzandehmehr, Soudabeh Ghosi, Michelangelo Paci, Jari Hyttinen, Jussi Koivumäki</i>	
Transformer Network with Time Prior for Predicting Clinical Outcome from EEG of Cardiac Arrest Patients .....	447
<i>Maurice Rohr, Tobias Schilke, Laurent Willems, Christoph Reich, Sebastian Dill, Gökhan Güney, Christoph Hoog Antink</i>	
Development of a Novel Machine Learning-Based Methodology for the Differential Diagnosis of Wide QRS Complex Arrhythmias Using Automated Analysis of 12-Lead ECG .....	451
<i>Mikhail Chmelevsky, Margarita Budanova, Svyatoslav Khamzin</i>	
Comparison of Continuous Non-Invasive Blood Pressure Monitors Finapres Nova and Caretaker 4 During Rest and Laboratory Interventions .....	455
<i>Siri Sytälä, Mira Haapatikka, Antti Vehkaoja</i>	
Developing a Machine Learning Pipeline for Predicting Neurological Outcomes in Comatose Cardiac Arrest Survivors Using Continuous EEG Data .....	459
<i>Quenaz Soares, Felipe M Dias, Estela Ribeiro, Jose E Krieger, Marco A Gutierrez</i>	
Assessment of QT Interval Dynamics Induced by Heart Rate Changes Through Bivariate Phase-Rectified Signal Averaging.....	463
<i>Alba Martín-Yebra, Joaquín Molinos, Juan Pablo Martínez</i>	
ECG-Based Characterization of Acute Ischemia During Percutaneous Coronary Intervention .....	467
<i>Jimena Rodriguez-Carbó, Ana Mincholé, Esther Pueyo</i>	
Triangle Simplex Plots for Representing and Classifying Heart Rate Variability .....	471
<i>Mateusz Solinski, Courtney N Reed, Elaine Chew</i>	
Time Delay Stability Analysis of Pairwise Interactions Amongst Ensemble-Listener RR Intervals and Expressive Music Features .....	475
<i>Mateusz Solinski, Courtney N Reed, Elaine Chew</i>	
An Improved Estimation of Unsuitable Segments of Ballistocardiography Records Using Wavelet Transforms.....	479
<i>José A. García-Limón, Carlos Alvarado-Serrano, Ramon Casanella</i>	
Predicting Readmission of Heart Failure Patients .....	483
<i>Zuzana Koscova, Eniko Vargova, Jan Pavlus, Radovan Smisek, Ivo Viscor, Veronika Bulkova, Filip Plesinger</i>	
Detection of Pre- and Post-Trigger Atrial Fibrillation in Long-Term Photoplethysmogram Signals Acquired in Free-Living .....	487
<i>Vilma Pluščiauskaitė, Monika Butkuvienė, Andrius Sološenko, Karolina Janciulevičiūtė, Vaidotas Marozas, Leif Sörnmo, Andrius Petrenas</i>	

Outlier Detection in ECG .....	491
<i>Omar Atamny, Ardan Saguner, Roger Abaecherli, Ender Konukoglu</i>	
Parameter Estimation for Personalized Cardiac Models Via Active Learning .....	495
<i>Pradeep Bajracharya, Anton J Prassl, Karli Gillette, Gernot Plank, Linwei Wang</i>	
Coverage of PPG-Based Wearable Devices in Office Tasks .....	499
<i>Francesco Ferrati, Eduardo Gil, Jesús Lázaro</i>	
Subject-Specific Ablation of Pathologic Conduction Patterns Beyond the Pulmonary Veins: A Personalised Modelling Approach.....	503
<i>Ovais A Jaffery, Caterina Vidal Horrach, Daniel J Lagalante, George Thomas, Gregory Slabaugh, Lea Melki, Wilson W Good, Caroline H Roney</i>	
Embracing the Imaginary: Deep Complex-Valued Networks for Heart Murmur Detection .....	507
<i>Erika Bondareva, Georgios Rizos, Jing Han, Cecilia Mascolo</i>	
Predicting Comatose Patient's Outcome Using Brain Functional Connectivity with a Random Forest Model.....	511
<i>Inés W Sampaio, Matteo Leccardi, Cristian Drudi, Jiaying Liu, Francesca Righetti, Anna M Bianchi, Riccardo Barbieri, Luca Mainardi</i>	
Cardiovascular Reflections of Sympathovagal Imbalance Precede the Onset of Atrial Fibrillation .....	515
<i>Alexander Hammer, Hagen Malberg, Martin Schmidt</i>	
Lightweight Arrhythmia Detection Based on Momentum Contrast Learning.....	519
<i>Zhongyu Wang, Caiyun Ma, Shuo Zhang, Yuwei Zhang, Jianqing Li, Chengyu Liu</i>	
ECG-Based Assessment and Therapeutic Implications of AV Nodal Conduction Dynamics During Atrial Fibrillation.....	523
<i>Mattias Karlsson, Mikael Wallman, Pyotr G Platonov, Sara R Ulmoen, Frida Sandberg</i>	
Spectral Profiles of Sonothrombolysis Bubble Radiation .....	527
<i>Vitoria S Souza, Sergio S Furui</i>	
Uncertainty Quantification of the Effect of Variable Conductivity in Ventricular Fibrotic Regions on Ventricular Tachycardia .....	531
<i>Jake A Bergquist, Matthias Lange, Brian Zenger, Ben Orkild, Eric Paccione, Eugene Kwan, Bram Hunt, Jiawei Dong, Rob S Macleod, Akil Narayan, Ravi Ranjan</i>	
ECG-Based Unsupervised Clustering in Coronary Artery Disease Associates with Ventricular Arrhythmia .....	535
<i>Josseline Madrid, Patricia B Munroe, Stefan Van Duijvenboden, Julia Ramírez, Ana Mincholé</i>	
Predicting Cardiac Arrest Recovery with Shallow and Deep Learning Models.....	539
<i>Ekenedirichukwu Obianom, Marko Mäkinen, Noor Qaqos, Shamsu Idris Abdulla, Fernando S Schlindwein, G André Ng, Xin Li</i>	
Prediction of Hypoxic-Ischemic Encephalopathy Using Events in Fetal Heart Rate and Uterine Pressure .....	543
<i>Johann Vargas-Calixto, Yvonne W. Wu, Michael Kuzniewicz, Marie-Coralie Cornet, Heather Forquer, Lawrence Gerstley, Emily Hamilton, Philip Warrick, Robert Kearney</i>	
Similarity Prediction of Intracardiac Electrograms Images Using Regression Model Based on Siamese Network Architecture .....	547
<i>Evgeny Lyan, Likoh Nicholson, Adrian Zaman, Vera Maslova, Derk Frank, Thomas Demming</i>	

Nonlinear Hemodynamic Control Design Via Input-Output Linearization.....	551
<i>Yasuyuki Kataoka, Jon Peterson</i>	
What Type of Drug Would Be Antiarrhythmic in Acute Myocardial Ischemia? Insights from Simulations.....	555
<i>Ander Loidi, Nuria Lopez, Beatriz Trenor, José M Ferrero</i>	
Validation of Wearable Derived Heart Rate Variability and Oxygen Saturation from the Garmin's Health Snapshot.....	559
<i>Kieran Williams, Alexandra Jamieson, Nishi Chaturvedi, Alun Hughes, Michele Orini</i>	
Multimodal Deep Learning Approach to Predicting Neurological Recovery from Coma After Cardiac Arrest.....	563
<i>Felix Krones, Ben Walker, Guy Parsons, Terry Lyons, Adam Mahdi</i>	
A Causal Discovery Approach to Streamline Ionic Currents Selection to Improve Drug-Induced TdP Risk Assessment.....	567
<i>Safaa Al-Ali, Jordi Llopis-Lorente, Maria Teresa Mora, Maxime Sermesant, Beatriz Trenor, Irene Balelli</i>	
Performance of Noncontact Video-Based Detection of Pulse Rate and Atrial Fibrillation on Personal Computers Utilizing a Webcam .....	571
<i>Gill R Tsouri, Alex Page, Margot Lutz, Jean-Philippe Couderc</i>	
Automatic Detection of Acute Mental Stress with Camera-Based Photoplethysmography .....	575
<i>Hannes Ernst, Hagen Malberg, Martin Schmidt</i>	
Frequency and Time Domain EEG Analysis for Prognostication of Postanoxic Comatose Patients .....	579
<i>Subhash Khambampati, Sushanth Reddy Dondapati, Chaithanya Kalyan Reddy Bhuma, Bharadwaj Madiraju, Rahul Krishnan Pathinarupothi</i>	
Quantification of Local Calcium Releases Contribution to Diastolic Depolarization in a 3D Model of Single Rabbit Sinoatrial Node Cell .....	583
<i>Eugenio Ricci, Chiara Bartolucci, Stefano Severi</i>	
Subcutaneous Tissue Transient Thermal Profiling Under RF-Energy Pulsed Wireless Supply to 3W–8W Rated LVAD in the Living and Cadaver Models.....	587
<i>Omar J Escalona, Brommely Finn, Mohammad L Karim, Antonio Bosnjak, David McEneaney</i>	
A Modified Fitzhugh-Nagumo Model that Reproduces the Action Potential and Dynamics of the Ten Tusscher Et Al. Cardiac Model in Tissue.....	591
<i>Evan Rheaume, Hector Velasco-Perez, Darby Cairns, Maxfeild Comstock, Elisa Rheaume, Abuzar Kaboudian, Ilijia Uzelac, Elizabeth M Cherry, Flavio H Fenton</i>	
A Multilayer CNN Using the ECG, Age and Sex Predicts Ventricular Arrhythmias in the General Population.....	595
<i>Julia Ramirez, Antonio Miguel, Stefan Van Duijvenboden, Michele Orini, William J Young, Andrew Tinker, Pier D Lambiase, Patricia B Munroe, Juan Pablo Martinez</i>	
A Comparative Analysis of Data-Driven Modelling Techniques for 30-Day Heart Failure Readmission Prediction .....	599
<i>Ryan Missel, Jesdin Raphael, Christopher Haggerty, Dustin Hartzel, Jeffery Ruhl, Brandon Fornwalt, Linwei Wang</i>	

Prospects of Cuffless Pulse Pressure Estimation from a Chest-Worn Accelerometer Contact Microphone .....	603
Arash Shokouhmand, Haoran Wen, Samiha Khan, Joseph A. Puma, Amisha Patel, Philip Green, Farrokh Ayazi, Negar Ebadi	
Exploring Ventricular Repolarization Gradients in Control Subjects Using the Equivalent Dipole Layer.....	607
Manon Kloosterman, Machteld J Boonstra, Iris Van Der Schaaf, Peter Loh, Peter M Van Dam	
A Temporal-Spectral Based Single-lead Electroencephalogram Feature Fusion Network May Provide Potential Clinical Biomarker for Cardiac Arrest .....	611
Zhaoyang Cong, Minghui Zhao, Li Ling, Feifei Chen, Lukai Pang, Keming Cao, Jianqing Li, Chengyu Liu	
DL-LVEF: Deep-Learning Measurement of the Left Ventricular Ejection Fraction from Echocardiographic Images .....	615
Agnese Sbrollini, Mhd Jafar Mortada, Selene Tomassini, Haidar Anbar, Micaela Morettini, Laura Burattini	
Computing in Cardiology 2023 Awards Summary .....	619
Rosanna Degani Young	
HyperEnsemble Learning from Multimodal Biosignals to Robustly Predict Functional Outcome After Cardiac Arrest .....	623
Morteza Zabihi, Alireza Chaman Zar, Pulkit Grover, Eric S. Rosenthal	
Towards Invariant Soft Biometrics from Electrocardiograms .....	627
Arian Ranjbar, Bjørn-Jostein Singstad, Jesper Ravn, Henrik Schirmer	
Analysis of Reward Formulation Based on Mean Arterial Pressure in Reinforcement Learning for Critically Ill Septic Patient .....	631
Cristian Drudi, Maximiliano Mollura, Riccardo Barbieri	
Study of Traditional and Enhanced Poincare Plot Descriptors for Atrial Fibrillation Detection .....	635
Sadaf Moharreri, Shahab Rezaei, Nader Jafarnia Dabanloo, Saman Parvaneh	
Quantifying Uncertainty of a Deep Learning Model for Atrial Fibrillation Detection from ECG Signals .....	639
Md Moklesur Rahman, Massimo Walter Rivolta, Fabio Badilini, Roberto Sassi	
Speeding Up Cardiac Simulations with Parallel-In-Time Solvers.....	643
Maxfield R Comstock, Elizabeth M Cherry	
Interdependence in the Cardiorespiratory Network of Preterm Infants with Pulmonary Hypertension Using Mutual Information Analysis.....	647
Pravitha Ramanand, Premananda Indic, Samuel J Gentle, Namasivayam Ambalavanan	
Assessment of Consumer-Grade Wearable Devices to Track Sleep in Healthy Individuals in Free-Living Conditions.....	651
Sanjay Rajput, Alexandra Jamieson, Nishi Chaturvedi, Alan Hughes, Michele Orini	
A Machine Learning-Based Approach for Automatic Coronary Sinus Vein Segmentation and Anatomy Reconstruction .....	655
Aleksandr Sinitca, Mikhail Chmelevsky, Stepan Zubarev, Aleksandr Shirshin, Arsenii Dokuchaev, Margarita Budanova, Chiara Arduino, Svyatoslav Khamzin, Anastasia Bazhutina, Sergei Rud, Werner Rainer	

Inverse Solution Accuracy Using 12-Lead ECG Vs 9 Significant Electrodes Derived by Greedy Algorithm .....	659
<i>Beata Ondrusova, Peter Tino, Jana Svehlikova</i>	
Should I Tilt Or Should I Push? Effect of Contact Force and Catheter Inclination in Cardiac RF Ablation .....	663
<i>Massimiliano Leoni, Argyrios Petras, Zoraida Moreno Weidmann, Jose M Guerra, Luca Gerardo-Giorda</i>	
Random Forest and Attention-Based Networks in Quantifying Neurological Recovery .....	667
<i>Mostafa Moussa, Hessa Alfallahi, Mohanad Alkhodari, Leontios Hadjileontiadis, Ahsan Khandoker</i>	
Generated ECG Signal Feasibility Evaluation for Classification .....	671
<i>Gi-Won Yoon, Segyeong Joo</i>	
Oxidative Stress Markers Identify Cardiac Autonomic Neuropathy Progression: Applying Machine Learning Methods.....	675
<i>Alaa Alqaryuti, Nadeen Faraj, Mohamed Abdelmagid, Maher Maalouf, Herbert F Jelinek</i>	
Reading Between the Leads: Local Lead-Attention Based Classification of Electrocardiogram Signals .....	679
<i>Gouthamaan Manimaran, Sadasivan Puthusserypady, Helena Dominguez, Jakob E Bardram</i>	
Evaluation of a QT Adaptation Time Estimator for ECG Exercise Stress Test in Controlled Simulation .....	683
<i>Cristina Pérez, Esther Pueyo, Juan Pablo Martínez, Leif Sörnmo, Pablo Laguna</i>	
Effects of Biventricular Pacing Locations on Anti-Tachycardia Pacing Success in a Patient-Specific Model .....	687
<i>Eric N Paccione, Matthias Lange, Benjamin A Orkild, Jake A Bergquist, Eugene Kwan, Bram Hunt, Derek Dosdall, Rob S Macleod, Ravi Ranjan</i>	
Computational Study of Drug Effects on Different Atrial Fibrillation Stages.....	691
<i>Violeta Puche-García, Lucía Romero, Javier Saiz</i>	
A Novel Wearable Insole BCG as a Surrogate of the Standard Vertical Weighing Scale BCG .....	695
<i>José A. García-Limón, Carlos Alvarado-Serrano, Ramon Casanella</i>	
Image-Guided Cardiac Interventions Using Contemporary Mid-Field Magnetic Resonance Imaging.....	699
<i>Adrienne E Campbell-Washburn</i>	
Differential Diagnosis of Wide QRS Complex Arrhythmias Using a Novel Slow Conduction Index Algorithm .....	703
<i>Mikhail Chmelevsky, Margarita Budanova</i>	
Optimal Artificial Neural Network for the Diagnosis of Chagas Disease Using Approximate Entropy and Data Augmentation .....	707
<i>Maria Fernanda Rodriguez, Diego Rodrigo Cornejo, Luz Alexandra Díaz, Antonio Ravelo-García, Esteban Alvarez, Victor Cabrera-Caso, Dante Condori-Merma, Miguel Vizcarro Cornejo</i>	
Deep Learning System for Left Ventricular Assist Device Candidate Assessment from Electrocardiograms.....	711
<i>Antonio Mendoza, Mehdi Razavi, Joseph R. Cavallaro</i>	

PhysioZoo: The Open Digital Physiological Biomarkers Resource .....	715
<i>Joachim A Behar, Jeremy Levy, Eran Zvuloni, Sheina Gendelman, Aviv Rosenberg, Shany Biton, Raphael Derman, Jonathan A Sobel, Alexandra Alexandrovich, Peter H Charlton, Márton Á Goda</i>	
Improved Machine Learning Strategies and Algorithms for Transmembrane Potential Estimation in Homogeneous Medium .....	719
<i>Enrique Feito-Casares, Francisco M. Melgarejo-Meseguer, Arcadi García-Alberola, José Luis Rojo-álvarez</i>	
Patient-Specific Atrial Fibrillation Simulation Prediction Depend on Rhythm Used for Calibration .....	723
<i>Caterina Vidal Horrach, Ovais Ahmed Jaffery, Ross J Hunter, Shohreh Honarbakhsh, Caroline Roney</i>	
Prediction of Left Ventricular Ejection Fraction Using an ECG-Based LSTM Model in Chagas Disease Patients .....	727
<i>João Gabriel Soares Ferreira, Luís Otávio Rigo, Roberto Coury Pedrosa, João Paulo Do Vale Madeiro</i>	
Automated Customization of Cardiac Electrophysiology Models to Facilitate Patient-Specific Modeling .....	731
<i>Darby I Cairns, Maxfield R Comstock, Flavio H Fenton, Elizabeth M Cherry</i>	
Capturing the Influence of Conduction Velocity on Epicardial Activation Patterns Using Uncertainty Quantification .....	735
<i>Anna Busatto, Lindsay C Rupp, Karli Gillette, Akil Narayan, Gernot Plank, Rob S Macleod</i>	
Computational Investigation of Atrial Driving: How Sinoatrial Node Heterogeneity Affects the Heart Rate.....	739
<i>Eugenio Ricci, Chiara Bartolucci, Moreno Marzella, Stefano Severi</i>	
Morphological and Temporal Variations of Seismocardiograms Across the Chest: A Guide for Single Channel Sensor Placement .....	743
<i>Deboleena Sadhukhan, Christian Dorme, Mathias Fink, Ros Kiri Ing</i>	
FHSU-NETR: Transformer-Based Deep Learning Model for the Detection of Fetal Heart Sounds in Phonocardiography.....	747
<i>Murad Almadani, Mohanad Alkhodari, Samit Kumar Ghosh, Ahsan H Khandoker</i>	
Dronedarone's Efficacy in Preventing Arrhythmias During Myocardial Ischemia Or Short QT Syndrome: A Computational Study .....	751
<i>Li Lyu, Wei Wang, Yuxin Lin, Kuanquan Wang</i>	
Introducing the ARGO Dataset of Post-Ischemic Ventricular Tachycardia Bipolar Electrograms.....	755
<i>Marco Orrú, Giulia Baldazzi, Stefano Bandino, Davide Zirolia, Livio Bertagnolli, Graziana Viola, Danilo Pani</i>	
Synchronization of Conventional Electrocardiogram Recordings for Accurate Vectorcardiography Reconstruction.....	759
<i>Elisa Ramírez, Samuel Ruipérez-Campillo, Francisco Castells, Rubén Casado-Arroyo, José Millet</i>	
Deep Learning Models for Arrhythmia Classification Using Stacked Time-Frequency Scalogram Images from ECG Signals .....	763
<i>Parshuram N. Aarotale, Ajita Rattani</i>	

Functional Outcome Prediction After Cardiac Arrest Using Machine Learning and Network Dynamics of Resting-State Electroencephalography .....	767
<i>Charlotte Maschke, Kira Dolhan, Beatrice P De Koninck, Miriam Han, Stefanie Blain-Moraes</i>	
QRS Width and T-Peak to T-End Interval Are Prolonged in Preadolescents with Severe Intrauterine Growth Restriction at Birth When Compared to Controls.....	771
<i>Freddy L Bueno-palomeque, Konstantinos A Mountris, Nuria Ortigosa, Raquel Bailón, Bart Bijnens, Fátima Crispí, Esther Pueyo, Ana Mincholé, Pablo Laguna</i>	
Spatiotemporal Correlation Analysis of Cardiac Activation Patterns in Langen-Dorff-Perfused Human Hearts: Insights for Arrhythmia Prediction.....	775
<i>Anna Crispino, Alessandro Loppini, Ilija Uzelac, Simonetta Filippi, Flavio H. Fenton, Alessio Gizzi</i>	
A Comparison of Infrasonic and Audio Components in the Seismocardiogram .....	779
<i>Johannes J Struijk, Peter Søgaard, Kasper Sørensen, Lana Barawi, Bertram Vorm, Mette Thomsen, Samuel E Schmidt</i>	
A Deep Learning Model for Recognizing Pediatric Congenital Heart Diseases Using Phonocardiogram Signals.....	781
<i>Md Hassanuzzaman, Nurul Akhtar Hasan, Mohammad Abdullah Al Mamun, Khawza I. Ahmed, Ahsan H. Khandoker, Raqibul Mostafa</i>	
Case Study: Fetal Breathing Movements as a Proxy for Fetal Lung Maturity Estimation.....	785
<i>Márton Á Goda, Ron Beloosesky, Chen B David, Zeev Weiner, Joachim A Behar</i>	
An Approach for Designing Patient-Specific Prosthetic Aortic Valves Based on CTA Images Using Fluid-Structure Interaction (FSI) Method.....	789
<i>Yingyi Geng, Yue Wang, Yanqiong Ye, Zhenyin Fu, Dongdong Deng, Yanqiu Feng, Wufan Chen, Ling Xia</i>	
Ultra-Short Beat-to-Beat Repolarization Variability Predicts Cardiovascular Events in Individuals Without Cardiovascular Disease.....	793
<i>Michele Orini, Stefan Van Duijvenboden, Julia Ramírez, Will Young, Andrew Tinker, Patricia B Munroe, Pier D Lambiase</i>	
Comparison of Pericardium Modeling Approaches for Mechanical Whole Heart Simulations .....	797
<i>Jonathan Krauß, Tobias Gerach, Axel Loewe</i>	
A Neurological Recovery Prediction Algorithm Based on Multi-Feature Extraction and Bagging Aggregation.....	801
<i>Ke Jiang, Zirui Wang, Runze Shen, Sibo Wang, Yang Liu, Yizhuo Feng, Xiaohe Lisun, Zhenfeng Li</i>	
A 3D Camera-Based Approach to High-Density ECG Imaging.....	805
<i>Nikhil Shenoy, Maryam Toloubidokhti, Linwei Wang, Vivek Singh, Ankur Kapoor</i>	
Continuity of Microscopic Cardiac Conduction in a Computational Cell-By-Cell Model.....	809
<i>Joshua Steyer, Fatemeh Chegini, Mark Potse, Axel Loewe, Martin Weiser</i>	
Changes in T-Peak-to-T-End Morphology Measured by Time-Warping Are Associated with Ischemia-Induced Ventricular Fibrillation in a Porcine Model.....	813
<i>Neurys Gómez, Julia Ramírez, Alba Martín-Yebra, Marina M Demidova, Pyotr Platonov, Juan Pablo Martínez, Pablo Laguna</i>	

Neurological Outcome Prediction After Cardiac Arrest: A Multi-Level Deep Learning Approach with Feature and Decision Fusion .....	817
<i>Bill Chen, Jiamu Yang, Ke W Wang, Hayoung Jeong, Perisa Ashar, Leeor Hershkovich, Md Mobashir Hasan Shandhi, Jessilyn P Dunn</i>	
Physiological Variations in CX43 and Fibrosis Deposition Affect Human Ventricular Electrophysiology Promoting Arrhythmia.....	821
<i>Laura García-Mendivil, María Pérez-Zabalza, Ricardo M Rosales, José M Vallejo-Gil, Javier Fañanás-Mastral, Manuel Vázquez-Sancho, Javier A Bellido-Morales, Alexander S Vaca-Núñez, Carlos Ballester-Cuenca, Laura Ordovás, Esther Pueyo</i>	
Feasibility of ECGI Endocardial Solutions in Localizing the VT Reentrant Circuit .....	825
<i>Maryam Toloubidokhti, Omar A Gharbia, Natalia Trayanova, John Sapp, Linwei Wang</i>	
Spatial Dispersion of Activation and Repolarization Times Associated with Different Cardiac Pacing Modes .....	829
<i>Saúl Palacios, Radovan Smisek, Karol Curila, Uyen Nguyen, Frits W Prinzen, Josef Halamek, Filip Plesinger, Pavel Jurak, Juan Pablo Martínez, Esther Pueyo</i>	
Virtual Histology of the Heart Through CT Imaging: Preliminary Results of a Novel Noninvasive Approach for Cardiac Tissue Characterization .....	833
<i>Riccardo Forni, Carmine Gelormini, Cristiana Corsi, Paolo Gargiulo</i>	
Localization of Ischemic Myocardial Segments from 12-Lead ECG Using the Spatial ECG.....	837
<i>Vito Starc</i>	
Single Reference Segmentation to Estimate T-Wave Alternans .....	841
<i>E Sánchez-Carballo, F M Melgarejo-Meseguer, J L Rojo-Álvarez, A García-Alberola, Y Rudy</i>	
3D Printed Dry Electrodes for Single-Lead Newborn ECG Monitoring.....	845
<i>Abdelrahman Abdou, Niraj Mistry, Sridhar Krishnan</i>	
Predicting Neurological Recovery from Coma After Cardiac Arrest: The George B. Moody PhysioNet Challenge 2023 .....	849
<i>Matthew A Reyna, Edilberto Amorim, Reza Sameni, James Weigle, Andoni Elola, Ali Bahrami Rad, Salman Seyed, Hyeokhyen Kwon, Wei-Long Zheng, Mohammad M Ghassemi, Michel Jam Van Putten, Jeannette Hofmeijer, Nicolas Gaspard, Adithya Sivaraju, Susan T Herman, Jong Woo Lee, M Brandon Westover, Gari D Clifford</i>	
ECG Decomposition Using Cascaded Spline Projection Residual Auto Encoders .....	853
<i>Kaveh Samiee, Péter Kovács</i>	
Implications of Hemodynamic Forces on Device Stability in Transcatheter Mitral Valve Replacement .....	857
<i>Samuel J Hill, Ronak Rajani, Adelaide De Vecchi</i>	
Use of AI to Assess Control and Diseased Children at 10 Years of Age .....	861
<i>Taher A Biala, Ahmad Ramahi, Obianom Ekenedirichukwu, Xin Li, Fernando S Schlindwein</i>	
Abnormal Cardiac Rhythm Detection Based on Photoplethysmography Signals and a Recurrent Neural Network .....	865
<i>Loïc Jeanningros, Jérôme Van Zaen, Clémentine Aguet, Mathieu Le Bloa, Alessandra Porretta, Cheryl Teres, Claudia Herrera, Giulia Domenichini, Patrizio Pascale, Adrian Luca, Jorge Solana Muñoz, Jean-Marc Vesin, Jean-Philippe Thiran, Etienne Pruvot, Mathieu Lemay, Fabian Braun</i>	

Using Wearable Photoplethysmography for Detecting Atrial Fibrillation in Ambulatory Conditions .....	869
<i>Tuomas Halkola, Sinikka Yli-Mäyry, Kjell Nikus, Antti Vehkaoja</i>	
Supervised Classification of Brugada Syndrome Patients by ECG-Derived Markers.....	873
<i>Alba Isabel-Roquero, Pedro Gomis, Luis Tortosa, Alvaro Leva, Flavio Palmieri, Elena Arbelo</i>	
Prediction of Spiral-Tip Trajectories Via Pseudo-ECGs and LSTM Networks.....	877
<i>Vasanth Kumar Babu, Jaya Kumar Alageshan, Rahul Pandit</i>	
Incremental Pacing Induces Sustained Reentry in a Computational Model of Brugada Syndrome .....	881
<i>Niccolò Biasi, Paolo Seghetti, Alessandro Tognetti, Edward J Vigmond</i>	
GPU Load Balancing Using Sparse Cartesian Grids: Making Interactive WebGL Simulations of Complex Ionic Models Even Faster on 3D Heart Structures.....	885
<i>Abouzar Kaboudian, Elizabeth M Cherry, Flavio H Fenton</i>	
Formation of the Wenckebach Periodicity in a Mathematical Model of Rabbit AV Node .....	889
<i>Elena Ryzhii, Maxim Ryzhii</i>	
Leveraging Unlabeled Electroencephalographic Data to Predict Neurological Recovery for Comatose Patients Following Cardiac Arrest.....	893
<i>Isaac Sears, Augusto Garcia-Agundez, George Zerveas, William Rudman, Laura Mercurio, Corey E. Ventetuolo, Adeel Abbasi, Carsten Eickhoff</i>	
In Silico Computation of Electrograms and Local Electrical Impedance to Assess Non-Transmural Fibrosis .....	897
<i>Carmen Martínez Antón, Jorge Sánchez, Nansi Caslli, Lena Heinemann, Laura Anna Unger, Axel Loewe, Olaf Dössel</i>	
Combining Complementary Models: Fusing CNNs, RNNs, and XGBoost for Enhanced Outcome Prediction of Comatose Patients After Heart Attack .....	901
<i>Shuaixun Wang, Siyi Liu, Martyn G Boutilie</i>	
SAF-Net: Self-Attention Fusion Network for Myocardial Infarction Detection Using Multi-View Echocardiography.....	905
<i>Ilke Adalioglu, Mete Ahishali, Aysen Degerli, Serkan Kiranyaz, Moncef Gabbouj</i>	
Detection of Persistent Atrial Fibrillation Using ECG Signal .....	909
<i>Md Mayenul Islam, Mohammad Abdul Motin</i>	
Synthetic Data Generation in Small Datasets to Improve Classification Performance for Chronic Heart Failure Prediction .....	913
<i>Roy S Zawadzki, Saman Parvaneh</i>	
A Novel Mapping Strategy of Repetitive Patterns in Consecutive Recordings to Localize Atrial Fibrillation Sources: An In-Silico Study.....	917
<i>Victor G Marques, Ali Gharaviri, Simone Pezzuto, Angelo Auricchio, Pietro Bonizzi, Stef Zeemering, Ulrich Schotten</i>	
Clinical Decision Support for Early Diagnosis of Cardiomegaly by Using Deep Learning Techniques on Chest X-Rays.....	921
<i>Erdem Yanar, Firat Hardalaç</i>	
Assessing Brain Dynamics for Predicting Postanoxic Coma Recovery: An EEG Based Approach.....	925
<i>Marc Goettling, Richard Hohmuth, Franz Ehrlich, Hannes Ernst, Alexander Hammer, Matthieu Scherpf, Martin Schmidt</i>	

Towards the Development of Virtual Heart Technology for Creating Digital Twins of Cardiac Electrophysiology.....	929
<i>Matthias Af Gsell, Luca Azzolin, Karli K Gillette, Aurel Neic, Thomas Schrotter, Franz Thaler, Gernot Plank</i>	
Revealing the Origin of Typical and Atypical Forms of Atrioventricular Nodal Reentrant Tachycardia with a Compact Computer Model of Rabbit AV Node.....	933
<i>Maxim Ryzhii, Elena Ryzhii</i>	
Substrate-Specific Simulations of Atrial Fibrillation Reproducing Electrophysiological Clinical Markers.....	937
<i>Maria Termenón-Rivas, Javier Barrios-álvarez De Arcaya, Giada S. Romitti, Pau Romero, Dolors Serra, Ignacio García-Fernandez, Miguel Lozano, Rafael Sebastian, Alejandro Liberos, Miguel Rodrigo</i>	
A Machine Learning Approach for Outcome Prediction in Postanoxic Coma Patients Using Frequency Domain Features.....	941
<i>Vijay Vignesh Venkataramani, Akshit Garg, Maitreya Maity, U Deva Priyakumar</i>	
Brain-Heart Interactions Modulate EEG Activity During Elicited Emotional States.....	945
<i>Feryal A Alskafi, Ahsan H Khandoker, Faezeh Marzbanrad, Herbert F Jelinek</i>	
Signal Processing and Machine Learning Automated Evaluation of Phrenic Nerve Affectation by Cardiac Stimulation.....	949
<i>Roberto Mateos-Gaitán, Antonio Gil-Izquierdo, F Javier Gimeno-Blanes, Francisco M Melgarejo-Meseguer, Carmen Muñoz-Esparza, José Luis Rojo-álvarez, Arcadi Garcia-Alberola, Juan José Sánchez-Muñoz, Francisco-Javier Gimeno-Blanes</i>	
Weakly Supervised P Wave Segmentation in Pathological Electrocardiogram Signals Using Deep Multiple-Instance Learning .....	953
<i>Jakub Hejc, Richard Redina, David Pospisil, Ivana Rakova, Jana Kolarova, Zdenek Starek</i>	
Optimizing Multiscale Entropy Analysis for the Detection of Cardiac Pathology .....	957
<i>Sara Nasrat, Ahsan Khandoker, Herbert Jelinek</i>	
An Embedding Approach for Biomarker Identification in Hypertrophic Cardiomyopathy .....	961
<i>Arash Kazemi-Díaz, Luis Bote-Curiel, María Sabater-Molina, Juan Ramón Gimeno-Blanes, Salvador Sala-Pla, Francisco Javier Gimeno-Blanes, Sergio Muñoz-Romero, José Luis Rojo-álvarez</i>	
Uncertainty Quantification of Fiber Orientation and Epicardial Activation.....	965
<i>Lindsay C Rupp, Anna Busatto, Jake A Bergquist, Karli Gillette, Akil Narayan, Gernot Plank, Rob S Macleod</i>	
Reconstruction of Corrupted Photoplethysmography Signals to Facilitate Continuous Monitoring.....	969
<i>Aikaterini Vraka, Juan M. Gracia-Baena, Flavia Ravelli, Philip Langley, Raúl Alcaraz, José J Rieta</i>	
Autonomic Regulation During Acute Mental Stress is Characterized by Dynamic Interactions .....	973
<i>Richard Hohmuth, Hannes Ernst, Hagen Malberg, Martin Schmidt</i>	
Detecting Patent Ductus Arteriosus in Neonatal Phonocardiograms.....	977
<i>Mohammad Ali Zamani, Ethan Grooby, James Lacey, Atul Malhotra, Faezeh Marzbanrad</i>	
Towards the Development of an in Silico Model for the Zebrafish Action Potential.....	981
<i>Ludovica Cestariolo, Jose M Ferrero, Zachary Long, T Alexander Quinn, Jose F Rodriguez Matas</i>	

An In-Silico Study of Sex Differences in Carotid Hemodynamic Waveforms.....	985
<i>Irene Suriani, R Arthur Bouwman, Massimo Mischi, Kevin D Lau</i>	
Characterising Resuscitation Events Using Wavelet Transforms of Digital Stethoscope Recordings During Cardiac Arrest.....	989
<i>Olibhéar McAlister, Adam Harvey, Paul Crawford, Raymond R Bond, Dewar D Finlay</i>	
An Automated Algorithm for Generating of AHA Model Based on 3D Heart Geometry .....	993
<i>Anastasia Bazhutina, Svyatoslav Khamzin, Mikhail Chmelevsky, Stepan Zubarev, Aleksandr Sinitca, Margarita Budanova, Werner Rainer</i>	
Evaluation of Automata-Based Simulations for Atrial Fibrillation in 2D/3D Geometries Reproducing Disease Progression .....	997
<i>Giada S. Romitti, Alejandro Liberos, María Termenón-Rivas, Javier Barrios-álvarez De Arcaya, Pau Romero, Dolors Serra, Ignacio García-Fernandez, Miguel Lozano, Rafael Sebastian, Miguel Rodrigo</i>	
Computationally Efficient Early Prognosis of the Outcome of Comatose Cardiac Arrest Survivors Using Slow-Wave Activity Features in EEG .....	1001
<i>Miikka Salminen, Juha Partala, Eero Väyrynen, Jukka Kortelainen</i>	
Photoplethysmogram Morphology in Stress: from Mental to Pain to Physical Activity-Induced Stress .....	1005
<i>Andrius Rapalis, Daivaras Sokas, Vilma Pluščiauskaitė, Sofija Jurgonytė, Živilė Stankevičiute, Jesús Lázaro, Asta Savaneviciene, Raquel Bailón, Eugenijus Kanudas, Vaidotas Marozas</i>	
Predicting Neurological Recovery After Cardiac Arrest from Electroencephalogram Using Residual Network and Random Forest.....	1009
<i>Beibei Wang, Hao Zhang, Mengxue Yan, Lirui Xu, Haonan Zhao, Jianqiang Liu, Jihang Xue, Zhen Fang</i>	
Using Embedding Extractor and Transformer Encoder for Predicting Neurological Recovery from Coma After Cardiac Arrest .....	1013
<i>Jan Pavlus, Kristyna Pijackova, Zuzana Koscova, Radovan Smisek, Ivo Viscor, Vojtech Travnicek, Petr Nejedly, Filip Plesinger</i>	
Generating Precordial-Lead Electrocardiogram from Smartwatch .....	1017
<i>Hyeon-Hwa Choi, Segyeong Joo</i>	
Artificial Neural Network for Predicting Cardiovascular Autonomic Reflex Tests from Inflammatory Markers.....	1021
<i>Moustafa Abdelwanis, Shahmir Khan, Ammar Hummieda, Shayaan Syed, Karim Moawad, Maher Maalouf, Herbert F Jelinek</i>	
Identifying Spatiotemporal Dispersion in Catheter Ablation of Persistent Atrial Fibrillation: A Comparative Study of Machine Learning Techniques Using Both Real and Realistic Synthetic Multipolar Electrograms.....	1025
<i>Sara Frusone, Rafael Costa De Almeida, Douglas Almonfrey, Fabien Squara, Vicente Zarzoso</i>	
An Algorithm for Non-Invasive Mapping Based on Cardiac Anatomy and 12-Lead Electrocardiogram Data.....	1029
<i>Svyatoslav Khamzin, Anastasia Bazhutina, Alexandr Sinitca, Mikhail Chmelevsky, Stepan Zubarev, Margarita Budanova, Werner Rainer</i>	
Cardiac Effect of Acupuncture on the Neiguan Point.....	1033
<i>Rita Laureanti, Paolo A Terranova, Alberto Lomuscio, Valentina Da Corino, Luca T Mainardi</i>	

Relevance of Pre-Training in the Development of a Light Convolutional Neural Network for ECG Quality Assessment .....	1037
<i>Alvaro Huerta, Arturo Martinez-Rodrigo, José J Rieta, Raúl Alcaraz</i>	
Combined Linear IIR and FIR Denoising Processes for Arm-ICG Waveform Features Determination in Ambulatory Cardiac Stroke-Volume Monitoring.....	1041
<i>Nicole Cullen, Omar J Escalona, Rafatul A Fahima, Idongesit Weli</i>	
Assessment of Deep Learning Approaches for the Detection of Cardio-Respiratory Causal Interactions .....	1045
<i>Andrea Rozo, Dries Testelmans, Bertien Buyse, Carlo Iorio, Xiao Hu, Carolina Varon</i>	
Using Consumer Camera and Custom Firmware to Monitor Heart Rate in Terminally Ill Children During Music Therapy.....	1049
<i>Maurice Rohr, Monika Hoog Antink, Sebastian Dill, Christoph Hoog Antink</i>	
Batrial Modelling for in Silico Prediction of Atrial Fibrillation Inducibility .....	1053
<i>Semhar B Misghina, Jose A Solis-Lemus, Edward J Vigmond, Steven A Niederer, Caroline H Roney</i>	
Heart Rate Variability During Sleep-Related Wake Phases in REM Sleep Behavior Disorder .....	1057
<i>Parisa Sattar, Elisa Facchini, Giulia Baldazzi, Nicla Mandas, Elisa Casaglia, Michela Figorilli, Laura Giorgetti, Pietro Mattioli, Dario Arnaldi, Monica Puligheddu, Danilo Pani</i>	
Risk of Post-Percutaneous Coronary Intervention Adverse Cardiac Events: What Does the Autonomic Nervous Systems Have to Do with It?.....	1061
<i>Herbert F Jelinek, Lama Rehman, Mika Tarvainen, Mohammed Andron</i>	
Dependence of Atrial Fibrillatory Rate Variations Induced by Head-Up/Down Tilt-Test on Autonomic Action .....	1065
<i>Chiara Celotto, Carlos Sánchez, Mostafa Abdollahpur, Frida Sandberg, Pablo Laguna, Esther Pueyo</i>	
The Correlation Between Phase Coherence of Respiratory Sinus Arrhythmia and Slow Wave Brain Activity is Altered in Depressed Patients with and Without Obstructive Sleep Apnea During Sleep .....	1069
<i>Yahya Alzaabi, Mostafa M. Moussa, Ahsan H Khandoker, Name. Yahya Alzaabi</i>	
A Digital Twin Approach for Stroke Risk Assessment in Atrial Fibrillation Patients .....	1073
<i>Matteo Falanga, Antonio Chiaravalloti, Corrado Tomasi, Cristiana Corsi</i>	
Predicting Coma Recovery After Cardiac Arrest with Residual Neural Networks.....	1077
<i>Kuba Weimann, Tim Of Conrad</i>	
Predicting Recovery from Coma Following Cardiac Arrest with a Reduced Set of EEG Channels .....	1081
<i>Nathan T Riek, Jonathan Elmer, Salah Al-Zaiti, Murat Akcakaya</i>	
Improvement Performance Deep Learning-Based Multi-Class ECG Classification Model with Limited Medical Dataset .....	1085
<i>Sanghoon Choi, Segyeong Joo</i>	
A Parameter Identification Approach Towards Analyzing Hemodynamics Based on Capnography.....	1089
<i>Wolfgang J Kern, Simon Orlob, Gabriel Putzer, Judith Martini, Martin Holler</i>	
Analysis of the Window Size Effect for T-Wave Alternans Detection Through Machine Learning Methods.....	1093
<i>Lidia Pascual-Sánchez, Rebeca Goya-Esteban, Fernando Cruz-Roldán, Antonio Hernández-Madrid, Manuel Blanco-Velasco</i>	

Atrial Fibrosis Distribution Generation Based on the Diffusion Models .....	1097
<i>Alexander M Zolotarev, Caroline H Roney</i>	
Classification of Cardiac Rhythms During Load-Distributing Band Cardiopulmonary Resuscitation .....	1101
<i>Andoni Elola, Iraia Isasi, Sara Entenza, Elisabete Aramendi, Lars Wik</i>	
Feature Extraction Strategies for Predicting Reduced Left Ventricular Ejection Fraction in Chagas Disease Patients .....	1105
<i>João Paulo Do Vale Madeiro, Luís Otavio Rigo, Roberto C Pedrosa</i>	
Automatic Prediction of the Origin in Outflow Tract Ventricular Arrhythmias with Machine Learning Combining Clinical Data and Electrocardiogram Analysis.....	1109
<i>Álvaro José Bocanegra, Diego Penela, Rafael Sebastian, Guillermo Jimenez-Perez, Andrea Saglietto, David Soto-Iglesias, Antonio Berrezzo, Gemma Piella, Oscar Camara</i>	
Observability Analysis of Data Reconstruction Strategies for a Cardiac Ionic Model.....	1113
<i>Laura M Muñoz, Anna E Marks, Julio A Santiago-Reyes, Mark O Ampofo, Elizabeth M Cherry</i>	
Predicting Recovery from Coma After Cardiac Arrest Using Low-Level Features from EEG Recordings and a Small-sized LSTM Network .....	1117
<i>Benjamin Cauchi, Marco Eichelberg, Andreas Hein</i>	
A Comparative Study on Detecting Heart Beats in Photoplethysmography Signals in Presence of Various Cardiac Arrhythmias.....	1121
<i>Loïc Jeanningros, Mathieu Le Bloa, Cheryl Teres, Claudia Herrera, Alessandra Porretta, Patrizio Pascale, Adrian Luca, Jorge Solana Muñoz, Giulia Domenichini, Jean-Marc Vesin, Jean-Philippe Thiran, Etienne Pruvot, Mathieu Lemay, Fabian Braun</i>	
MemoryInception: Predicting Neurological Recovery from EEG Using Recurrent Inceptions.....	1125
<i>Bjørn-Jostein Singstad, Jesper Ravn, Arian Ranjbar</i>	
Abnormal Rhythm Detection from a Single-Lead ECG Via a Recurrent Neural Network .....	1129
<i>Jérôme Van Zaen, Guillaume Bonnier, Jakub Parak, Mikko Salonen, Yara-Maria Proust, Luisa Marques, Alia Lemkadem, Cyril Pellaton, Mathieu Lemay</i>	
A Semantic Segmentation-Based Digitization of ECG Papers.....	1133
<i>Davyd Melo, João Paulo Madeiro, Luís O Rigo, Cláudia Do Ó Pessoa, Jose Antonio Macêdo, Danielo G Gomes</i>	
Prediction of Functional Recovery Post-Cardiac Arrest Using an Ensemble of Extreme Gradient-Boosted Trees .....	1137
<i>Matthew Kolisnyk, Xiaoyu Wang, Chao Guo, Shigeng Xie, Karnig Kazazian, Loretta Norton, Teneille Gofton, Saptharishi Lalgudi Ganesan, Adrian M Owen, Derek Debicki</i>	
Crucial Events Identify Emotion Granularity from Long-Term ECG Recordings .....	1141
<i>Sara Nasrat, Ahsan Khandoker, Herbert Jelinek</i>	
Role of Heterogeneous Ionic Profiles in Atrial Fibrillation Propagation. a Population of Models Study.....	1145
<i>Alejandro Liberos, Ximo Garcia-Gimeno, Giada S. Romitti, Ignacio García-Fernandez, Miguel Lozano, Rafael Sebastian, Miguel Rodrigo</i>	
Inflammation-Induced Remodeling and Atrial Arrhythmias in Systemic Lupus Erythematosus: in Silico Insights .....	1149
<i>Jorge Sánchez, Karla Arévalo Ruales, María Macarulla-Rodríguez, Cristian Barrios Espinosa, Axel Loewe, María S Guillem</i>	

Characterization of Cardiopulmonary Coupling in Pediatric Patients with Obstructive Sleep Apnea .....	1153
<i>Pablo Armañac-Julián, Adrián Martín-Montero, Salla Hietakoste, Jesús Lázaro, Samu Kainulainen, David Gozal, Roberto Hornero, Pablo Laguna, Gonzalo Gutiérrez-Tobal, Eduardo Gil, Raquel Bailón</i>	
A Multi-Channel EEG Data Analysis for Poor Neuro-prognostication in Comatose Patients with Self and Cross-Channel Attention Mechanism.....	1157
<i>Hemin Ali Qadir, Naimahmed Nesaragi, Per Steiner Halvorsen, Ilangko Balasingham</i>	
MelicientNet: Harnessing Mel-Spectrograms and EfficientNet Architectures for Predicting Neurological Recovery Post-Cardiac Arrest.....	1161
<i>Wenlong Wu, Ying Tan</i>	
Thermal Infrared Imaging for Investigating Changes of Vasomotion in Peripheral Circulation .....	1165
<i>Asger E Knudsen, Emil Korsgaard, Jeppe Færgemand B, Nikolaj Justesen, Samuel E Schmidt, Andrei Ciubotariu</i>	
Comparison of Machine Learning Detection of Low Left Ventricular Ejection Fraction Using Individual ECG Leads .....	1169
<i>Jake A Bergquist, Brian Zenger, James Brundage, Rob S Macleod, Rashmee Shah, Xiangyang Ye, Ann Lyones, Ravi Ranjan, Tolga Tasdizen, T Jared Bunch, Benjamin A Steinberg</i>	
Accelerometry-Guided Inter-Beat-Interval Assessment from Wrist Photoplethysmography .....	1173
<i>Peter H Charlton, Joachim A Behar, Márton Áron Goda, Jonathan Mant, Panicos A Kyriacou</i>	
Long-Term ECG Analysis Through Image Conversion and Deep Learning .....	1177
<i>Carlos Hernández-Fernández, Hilario Gómez-Moreno, Roberto Holgado-Cuadrado, Manuel Blanco-Velasco</i>	
Wearable ECG-Derived Respiration Performance for Respiratory Monitoring with a Non-Standard ECG Lead .....	1181
<i>Dolores Blanco-almazán, John Morales, Willemijn Groenendaal, Francky Catthoor, Raimon Jané</i>	
Variational Autoencoders for Electroencephalogram Feature Extraction in Patients with Coma After Cardiac Arrest.....	1185
<i>Adel Hassan, Liam Ferreira</i>	
ECG Morphology-Based Markers for Risk Stratification in Hypertrophic Cardiomyopathy .....	1188
<i>Inés Noguero-Soler, Javier Ramos-Maqueda, Pablo Revilla-Martí, Esther Pueyo, Ana Mincholé</i>	
Effect of Diurnal Rhythm on RR Interval Correlations of Long QT Syndrome Patients .....	1192
<i>Matias Kanniainen, Teemu Pukkila, Matti Molkkari, Esa Räsänen</i>	
A Dynamical Systems Approach to Predicting Patient Outcome After Cardiac Arrest .....	1196
<i>Richard J Povinelli, Mathew Dupont</i>	
EEG-Based Cardiac Arrest Outcome Estimation with Highly Interpretable Features.....	1200
<i>Álvaro José Bocanegra, Anaïs Espinoso, Ralph G Andrzejak, Oscar Camara</i>	
Investigation of Key Cellular Targets in Atrial Fibrillation Induced Electromechanical Remodeling Using Human Atrial Cardiomyocytes Model .....	1204
<i>Fazeelat Mazhar, Chiara Bartolucci, Cristiana Corsi, Stefano Severi</i>	

Can Multi-Source Phonocardiography Enable Inexperienced Users to Record Heart Sounds for  
Telemonitoring Applications? a Comparative Analysis..... 1208  
*Noemi Giordano, Samanta Rosati, Gabriella Balestra, Marco Knaflitz*

Pro-Arrhythmic Effects of Gaseous Pollutants Under Healthy Conditions: An In-Silico Study ..... 1212  
*Laura C Palacio, Javier Saiz, Catalina Tobón*

**Author Index**