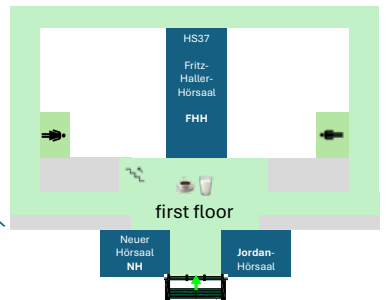
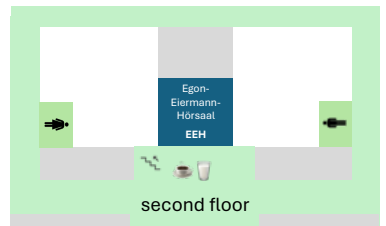
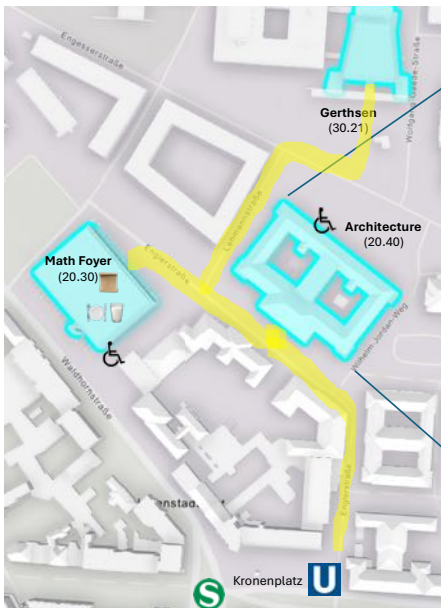


CiNC 24
Karlsruhe

51st International
**Computing in Cardiology
Conference**

Karlsruhe, Germany
September 8-11, 2024





Plenary sessions take place in *Gerthsen*, poster sessions in *Math* and parallel sessions in *Architecture*. Closest tram and underground stop: *Kronenplatz*. See pages 6 and following for more maps.

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Karlsruhe Institute of Technology

Endorsed by:



Welcome to Karlsruhe!

We are delighted to welcome you together with more than 400 participants to the beautiful city of Karlsruhe for the 51st edition of Computing in Cardiology: *#CinC2024*. It is a great honor to host the conference in the year we celebrate its 50th anniversary. This is only the third time since its inception and the first time in the 21st century that the conference is held in Germany. We are certain that Karlsruhe is a very good choice and eager to show you why in the coming days.

Karlsruhe was planned 300 years ago with the palace tower at the center and 32 streets radiating out from it like the spokes of a wheel, or the ribs of a folding fan, so that one nickname for Karlsruhe in German is the “fan city” (*Fächerstadt*). Almost all of these streets survive to this day. The lively cultural landscape in Karlsruhe will make the hearts of all culture lovers beat faster: over 50 museums, theatres and galleries in Karlsruhe are waiting to be visited. As one of the warmest cities in Germany, the Mediterranean flair entices locals and guests alike to enjoy mild summer evenings in the restaurants of the lively squares around the city centre.

The Sunday Symposium program is all about cardiac modeling. Presentations by international experts will feature different approaches for modeling cardiac function from nano scale to macro scale. The conference will be held on campus at the Karlsruhe Institute of Technology (KIT), the only German university of excellence with a national large-scale research section.

We have been working very hard to organize this event and are looking forward to meeting all of you in the coming days. Welcome to Karlsruhe and welcome to *#CinC2024*!

The CinC 2024 Local Organizing Committee



Axel Loewe, Jonathan Krauß, Tomas Stary, Joshua Steyer, G. Seemann, O. Dössel, I. Windbiel, M. Gahr

Welcome from the President

We are back in Europe again for CinC 2024 and it feels good, made even better by the outstanding organization of our local team this year. Although the CinC Society started in the US and is still officially registered there, the heart of our membership has resided for many years across the full area of Europe (and yes, we still include the UK (-:). It is also wonderful to have CinC back in Germany after 25 years, much too long a gap in my mind! It was even better to be in Karlsruhe, just an hour north of where I was a high school student. It feels like a homecoming. Karlsruhe has both a rich technical distant past (Heinrich Herz) and an ongoing role as a world leader in modeling and simulating cardiac function. The Sunday symposium will highlight this spectrum of cardiac modeling and frame its future.

As a discipline, our biggest opportunity and challenge (the two always go hand in hand) today is the role that AI and Machine Learning will play in our field. We are the people who will guide this transition, exploring where these tools can help, integrating them into the deep reservoir of centuries of knowledge about the heart, and then deciphering their meaning for our clinical colleagues. The CinC conferences will be a regular chance to learn, exchange ideas, and determine the future of these exciting technologies.

This is the first year in which the CinC has an explicit Code of Conduct. This comes about not because of any events within the organization or the conferences but rather because of the world outside our wonderful bubble. We live in contentious times and it felt essential to assure all conference participants that they would be respected at CinC.

This year is special for me as, after nine years as a Board member and seven as President, I have the pleasure of passing the torch to Olivier Meste. Olivier ran the fabulous Nice edition of CinC in 2015 and has been a Board member since 2020. For me, this has been an amazing ride that has given much more than it has taken. And the best of all has been the people I have met and become friends with, friends from all over the world who all teach me something. I will spend the next year as a past president, which mostly requires me to stay out of the way and let the next generation take the Society in exciting new directions. It also means I will have more time to explore our host locations on my bicycle so let's connect for a ride!



Welcome from the Mayor of Karlsruhe

The international conference “Computing in Cardiology” is the leading conference in the field of cardiology technology, which aims to achieve a better understanding of heart disease using computer-aided methods. I am delighted that the 51st conference will be held in Karlsruhe and that we will be able to welcome more than 400 researchers from different academic backgrounds from all over the world as our guests in the heart of Europe.



Despite global digital networking activities, personal encounters remain indispensable when it comes to exchanging knowledge, experience and examples of best practice. After all, it is precisely the personal contacts, the small conversations in between, that trigger motivation for joint research endeavours and thus help to promote scientific exchange. Across national borders, you work towards a common goal: to understand heart disease better by using computer-aided methods in order to improve the possibilities of treating and curing sick people.

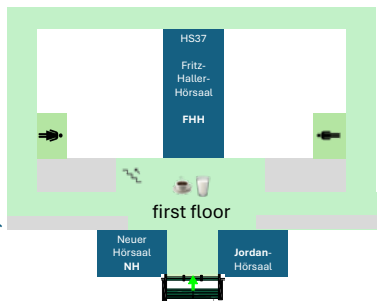
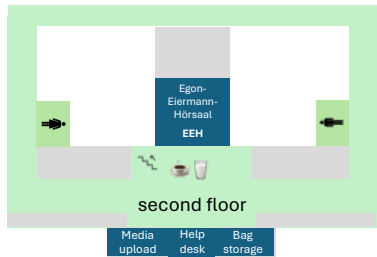
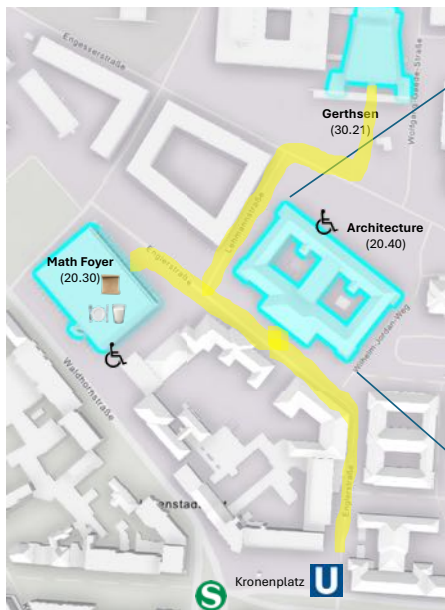
I therefore extend a warm welcome to the participants of the international conference “Computing in Cardiology” in the science and research city of Karlsruhe. Our city is an innovative and international location with a high quality of life that actively promotes, utilises and communicates new developments in business and science. A dense network of universities, research institutions and high-tech companies makes Karlsruhe the digital centre of the region.

I wish the conference much success, its participants a lively exchange of experiences and many new insights for the promotion of global heart health. May you also have a little time to get to know our beautiful city.

A handwritten signature in black ink that reads "Frank Mentrup". The signature is written in a cursive, slightly stylized font.

Dr. Frank Mentrup
Mayor of the City of Karlsruhe

KIT Campus Venues



Plenary sessions on Monday morning and Wednesday afternoon will be held in the Gerthsen lecture hall (building 30.21, Wolfgang-Gaede-Straße 9). The parallel sessions will be held in the first and the second floor of the architecture building (building 20.40, Englerstraße 7). Poster sessions and lunch are located in the foyer of the math building (building 20.30, Englerstraße 2) on the other side of the street.

The Sunday Symposium, the Welcome Reception, the Conference Dinner and the City Hall reception are held off-campus. Details are given in the respective chapters.

An interactive map with Google Maps links for all venues is provided on the webpage: cinc2024.org/travel/venues

Building 30.21 (Gerthsen lecture hall, plenary sessions)



Architecture building (parallel sessions)



Math building (posters and lunch)



Sunday Symposium

The Sunday Symposium will be held at *Albert-Schweitzer-Saal* (Reinhold-Frank-Straße 48a, 76133 Karlsruhe) and the Welcome Reception afterwards at the local brewery *Badisch Brauhaus* (Stephanienstraße 38-40, 76133 Karlsruhe). As can be seen on the map below, these locations are very close to each other within 5 min walking distance. The closest tram stop to both Sunday venues is *Europaplatz/Postgalerie*.





Modeling Cardiac Function from Nano Scale to Macro Scale

8:30 *Pre-conference AI & Signal Processing Workshop*

11:00 *Pre-conference PhysioNet Challenge Hackathon*

12:30 *Registration opens*

13:30 *Welcome*

13:40 *Unveiling the Heart's Gender Divide: Sex-Specific Multi-scale Mechanisms of Atrial Arrhythmia Susceptibility*
Eleonora Grandi

14:20 *Modeling the Heart Cell by Cell*
Mark Potse

15:00 *Coffee break*

15:45 *Atrial Cardiomyopathy – The Substrate of Arrhythmogenesis in Atrial Fibrillation and Contractile Dysfunction with Risk for Thrombo-embolic Stroke*

Amir Jadidi

16:25 *Generation of Synthetic Databases of 12 lead ECGs using Electrophysiological Simulations*

Karli Gillette

17:05 *Panel discussion*

18:00 *Welcome reception at Badisch Brauhaus (see below)*

Welcome Reception – Badisch Brauhaus



Sunday starting 18:00, Stephaniensstraße 38-40, 76133 Karlsruhe (5 min walking from the Sunday Symposium location)

Tram stop: *Europaplatz / Postgalerie*

Monday Social Program

The networking program will start with boxed lunch right after the 10:30–12:00 parallel sessions. Be on time in the foyer of the architecture building (where the parallel sessions are held) to grab your lunch and find your group!

Black Forest Hike

Recommendations: Comfortable athletic attire, proper footwear, sun protection, a backpack with additional water(!), snacks. If you have Komoot, download the tour provided on the cinc2024.org webpage.

Water Fun

Recommendations: Comfortable athletic attire, sports shoes, sun protection, extra clothing and a towel (you may get wet), water.

High Rope Course

Recommendations: Comfortable athletic attire, sports shoes, sun protection, water.

City Walk

Recommendations: Comfortable attire, walking shoes, sun protection, water.

Brewery Tour

Recommendations: Proper footwear, a jacket (or sweater). There are large temperature differences between the individual production areas.

Zoo

Recommendations: Comfortable attire, walking shoes, sun protection, water.

ZKM Museum - Center for Art and Media

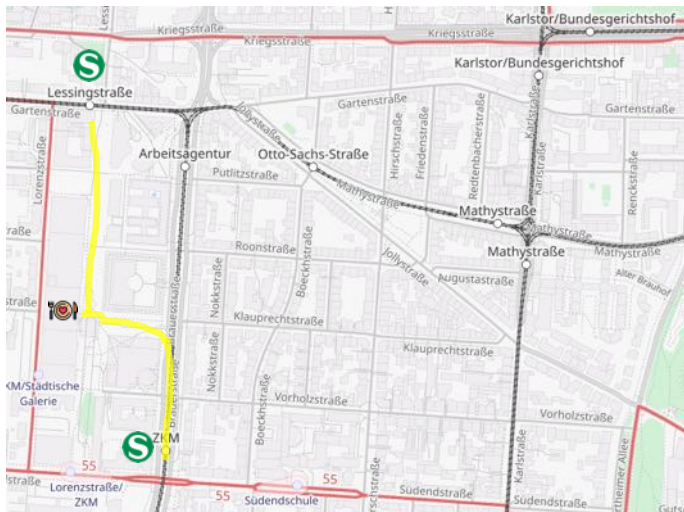
Recommendations: No backpacks allowed inside.

Gala Dinner at ZKM

The conference dinner will be held at ZKM, the Center for Art and Media (Lorenzstraße 19, 76135 Karlsruhe) on Monday starting at 18:30.



Tram stops: Either line 2 or S1/S11 at stop *ZKM*, then walk west or line 3, 4, S2, or S5/S51 at stop *Lessingstraße*, then walk south to get to the venue. The entrance is aside the cube pictured above.



Tuesday City Hall Reception

On Tuesday, the City of Karlsruhe is inviting all CinC participants for a reception at the city hall (Karl-Friedrich-Straße 10, 76133 Karlsruhe) at 19:00. We will be welcomed by a mayor of Karlsruhe and Prof. Dr. Michael Beigl, spokesperson of the *KIT Center Health Technologies*. No specific registration is required.



Tram stop: *Marktplatz (Pyramide)*



Afterwards, we recommend to walk a few meters north to the castle to watch the *Schlosslichtspiele*, a free light show on the facade of the Karlsruhe castle. www.schlosslichtspiele.de



Conference Information

Please wear your badge at all times. It is both your ticket to access the conference (meals, dinner, reception, etc.) and your free ticket for public transportation inside of Karlsruhe.

Code of Conduct

All participants in CinC events must behave professionally, ethically, and responsibly in all interactions with other CinC participants, e.g., at all CinC conferences, in formal or informal social activities, within related online communities, and on social media. All individuals participating in CinC activities must comply with the following standards of conduct. All participants at CinC events are expected to:

- Exercise consideration and respect for others in their speech and actions; listen to and respect other points of view.
- Refrain from speech or actions that are demeaning, discriminatory, or harassing. Any form of harassment, including sexual harassment, is prohibited.
- Treat everyone equally regardless of age, ethnicity, nationality, gender, political views, religious affiliation, cultural practices and beliefs. (This does not prevent anyone from expressing their own beliefs and respectfully disagreeing with others.)
- Uphold the principles of scientific inquiry, be open to new ideas, and use logic and empirical evidence as tools to justify our question research.
- Be mindful of their surroundings, their fellow participants, and the impact their actions and words might have on others.
- Alert a member of the conference staff or the CinC Board if they notice a dangerous situation, someone in distress, or violations of this Code of Conduct, even if they seem inconsequential. All alerts will be treated sensitively and in a timely fashion.

The CinC Board reserves the right to prohibit attendance by anyone violating this code of conduct immediately and at any future meeting.

Whova Conference App

We are using the Whova platform for both onsite and online attendees of #CinC2024. Download it on your phone to setup your individual schedule, network with fellow attendees and stay up to date with the latest news. All abstracts, preprints and poster can be accessed via Whova. Whova is available for Android, iOS and via any web browser. Check out the Whova User Guide for detailed instructions: https://whova.com/portal/compu_202409

Transportation

On the backside of your name badge, you have a personalized public transport ticket. It is also attached to the email confirming your registration and covers all trams and busses inside of the city of Karlsruhe (“Tarifwabe 100”).

Google Maps is mostly accurate for walking and public transport options, the KVV local transportation website/app is sometimes more up to date: www.kvv.de
Free floating rental bikes can be used after signing up at www.kvv-nextbike.de.
eScooters are available from voi and TIER.

Registration and Information Desk

On Sunday, you can register before and during the Sunday Symposium at Albert-Schweitzer-Saal (see page 8 for directions) starting 12:30. On Monday morning starting 7:45, the registration will be located right at the entrance of the Gerthsen lecture hall (building 20.31, see map on first page). From Monday 10:00 on, the registration and help desk will be located on the second floor of the architecture building (building 20.40) opposite of the Egon Eiermann lecture hall (see map on first page).

WiFi

On campus and in most parts of the city, you can access *eduroam* if your home institution is part of this association. Otherwise, there is a free public WiFi name *KA-WLAN*.

At the Welcome Reception in Badisch Brauhaus, you can use the *LAN1* network, which does not require a password.

Meals

The Sunday Symposium includes a coffee break (but no lunch) and an evening welcome reception at *Badisch Brauhaus*. Boxed lunch and dinner on Monday will be provided as part of the social program. Lunch will be provided on Tuesday and Wednesday in the foyer of the math building (see map on first page). Throughout the conference, coffee breaks (coffee, tea, water, pastry) are included as well and water dispensers are available. Also tap water is always a good option and strictly controlled in Germany. Drinks and nibbles are included during the Tuesday reception at the City Hall.

Accompanying Persons (Guests)

Registered guests are welcome to join the Welcome Reception at Badisch Brauhaus on Sunday evening, the social program on Monday afternoon (please be in the foyer of building 20.40 (architecture) at 12:30 or a few minutes earlier on Monday), the Conference Dinner on Monday evening, and the Reception at the City Hall on Tuesday evening.

Accessibility

All venues are accessible also with wheelchairs. For the *Architecture* and *Math* buildings, accessible entrances are different from the main entrance and indicated on the map on the first page. Look for CinC signs with the wheelchair icon. Accessible restrooms are available in all venues, some can only be accessed with the *EuroKey*. Don't hesitate to approach a volunteer if you don't have this key or need any other help!

Sustainability

We are committed to sustainability and have planned our event to be as green as possible. Here are some of our efforts, and we encourage you to take advantage of the suggestions below to "raise the sustainability bar".

Food

Our caterer will provide reusable food packaging. Plant based options will be offered. We serve buffets to avoid food waste.

Drinks

We try to avoid single-use plastics and cans. A reusable water bottle is included in the participant bag and we provide water dispensers. Also tap water is always a good option and strictly controlled in Germany.

Waste

Waste that cannot be avoided should be recycled. The city of Karlsruhe collects garbage separately for paper, plastic packaging, glass, and residual waste. Please support this recycling effort and dispose of your garbage in the appropriate containers.

Getting around

Karlsruhe is reachable by train within just a few hours from many European cities. Also direct bus connections exist throughout Europe. If you need to fly in, consider offsetting your carbon emissions.

Most of the hotels are at a walking distance from the conference venues. A public transport ticket covering all trams and buses within Karlsruhe is included in the conference registration. The ticket is included in your confirmation email and valid from Sunday to Wednesday.

Paper

We have attempted to minimize printouts and only provide a program booklet. You can access all abstracts and the published preprints using the Whova conference app.

Shirts

The conference shirts are organically sourced and fair trade.

Accommodation

All recommended hotels include attendee-specified temperature control. Please try to limit that temperature control while you are away from your room. All rooms have optional daily refreshing of linens, towels and consumables. We encourage everyone to request these services only when needed. cd

Practical Information

Weather

For the time of the conference, the usual average high is 21 °C (16°-27°), and the average low is 12 °C (8°-17°). It's often dry but can be rainy as well.

Time Zone

During September, Karlsruhe operates in Central European Summer Time (CEST/MESZ/UTC+2). The sun rises at around 7am and sets at around 8pm.

Emergency Phone Number

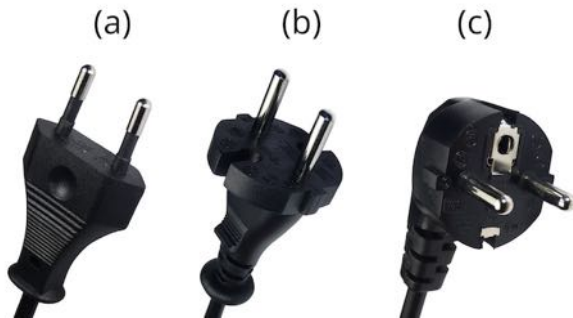
In case of an emergency, call 112. To learn where to get non-emergency medical aid, call 116117. As a European citizen, you can receive healthcare services using a European Health Insurance Card (EHIC) issued in your country of origin.

Money and Currency

Germany uses the Euro. Most places accept Visa and Mastercard, some, however don't. Especially food stands and some smaller shops might not accept cards. So it's always a good idea to have a few Euros in cash with you. You can withdraw Euros with your credit card at ATMs, which are quite ubiquitous. When in a restaurant or bar, it's nice to tip the waiter. 5-10 % are a usual range.

Electric Standards

The standard electric voltage in Germany is 230 V at a frequency of 50 Hz. The plug types commonly used are shown below.



Safety and Security

As everywhere, crime happens but Germany in general can be considered a rather safe place. Among the German cities with 100k inhabitants or more, Karlsruhe is slightly below the average incident rate. Walking or taking public transport during night time is common although it's always a good idea to stay in groups of two or more.

For Authors and Speakers

Oral Presentations

- The time allocated for each oral presentation is 10 minutes, followed by 5 minutes for Q&A. The only exception to the 10-minute limit for oral presentations is for the four finalists in the Rosanna Degani Young Investigator Award competition, who are each allotted 15 minutes for their talks, followed by 5 minutes for discussion.
- Light indicators inform you how much time is left for your presentation. Green: everything alright, orange: 2 min left, red: finish your presentation now.
- You will be introduced by the session's chairperson, who will also open the Q&A session after your presentation.
- Questions will be exclusively asked at the end of each speech, aiming to minimize interruptions and ensure a seamless online experience for attendees.
- Speakers are expected to adhere strictly to the event schedule, which will be enforced to finish sessions on time and to permit participants to move successfully from one parallel session to another.
- The preferred option is to use the presentation computer provided by us (Powerpoint, Keynote, web browser and PDF viewer available). Speakers have been contacted by email before the conference to upload their presentation online. Alternatively, you can bring a USB memory stick to the help desk (see map on first page) to upload your presentation. As a last resort, you can also bring a USB memory stick to the staff in the session room right at the end of the previous session. If you rather want to use your own device, you can connect to Zoom via Whova and share your screen. Be aware that this depends on your WiFi connection and might cause a bit of delay on the presentation screen, especially during animations or videos. No audio will be transmitted through Zoom, so this option is not for you if you have sound included in your presentation.
- Prepare your presentation before coming to the conference using suitable software, e.g., Microsoft PowerPoint, Apple Keynote, or PDF. If your

presentation includes video content, make sure it plays properly on the system available at the conference venue by testing it beforehand.

- All speakers must come to the room where you will present at least 10 minutes prior to your session, find and check in with one of the session chairs.
- The session chairpersons need to know who will present each scheduled paper. Help them by introducing yourself, and letting them know which paper you will present.
- There will also be a local helper available to provide technical assistance.

Poster Presentations

- All presenters will upload their poster as a PDF file (max. size of 10 MB) to the conference hosting site, Whova and have the option of also uploading a 3 minute video presenting the poster.
- In-person presenters will come to their poster session and present and discuss their study with conference attendees during their scheduled session (see page 23). Remote participants will be able to communicate with conference attendees (remote and in-person) via Whova's messaging features.
- Discuss your work with other conference attendees during the poster session. Authors are required to be present at their onsite posters during their assigned sessions. Authors presenting more than one poster in a session will normally find their posters assigned to adjacent locations; ask the poster session chair to reassign poster stands if necessary.
- All posters that are presented at the conference must be in portrait (i.e., vertical) orientation and be no larger than A0 size. A0 is equivalent to 841 (width) x 1189 (height) mm or 33.1 x 46.8 inches.
- Please mount your posters before your respective poster session on the poster boards provided in the foyer of building 20.30 (Math, see map on first page) and removed after the poster session.
- Posters are grouped by subject area, and each poster should be hung up on the stand assigned to it.

Scientific Program

See the back side of this booklet for an overview of sessions.

Welcome to CinC 2024 (Wel)

Mon, Sep 9 08:30-09:00 in room Gerthsen-Hörsaal (Gerthsen)

Chairs: Rob MacLeod, Axel Loewe

Rosanna Degani Young Investigator Finals (RDYIA)

Mon, Sep 9 09:00-10:30 in room Gerthsen-Hörsaal (Gerthsen)

Chairs: Marianna Meo, Rob MacLeod

09:00 *Model-based Analysis of Pulse Transit Time Characteristics During Obstructive Apnea (340)*

Arthur Ben-Tolila; Virginie le Rolle; Jean-Louis D. Pepin; Alfredo Hernandez

09:20 *Insights from Explainable Machine Learning on Batrial Arrhythmia Vulnerability Assessment (308)*

Patricia Martinez Diaz; Pascal Maierhofer; Michael Beigl; Axel Loewe; Olaf Doessel

09:40 *Maximum Shortening Velocity and Power Are Reduced in a Human Cross-bridge Model of Type 2 Diabetes (205)*

Julia H. Musgrave; June-Chiew Han; Marie-Louise Ward; Andrew Taberner; Kenneth Tran

10:00 *A Machine Learning Approach to Automated Localization of Targets for Ventricular Tachycardia Ablation Using Sinus Rhythm Signal Features (286)*

Xuezhe Wang; Adam Dennis; Tarv Dhanjal; Pier Lambiase; Michele Orini

ECG Analysis Technology (S21)

Mon, Sep 9 11:00-12:30 in room Fritz-Haller-Hörsaal (FHH)

Chairs: Stef Zeemering, Jake Bergquist

11:00 *A Transfer Learning Model -Based Patient-Specific ECG Lead Synthesis Algorithm (357)*

Joel Xue

11:15 *ECG Generation Based on Denoising Diffusion Probabilistic Models (27)*

Zhongyu Wang; Caiyun Ma; Minghui Zhao; Shuo Zhang; Jianqing Li; Chengyu Liu

11:30 *ECG Classification with Deep Unfolding Variable Projection Network (444)*

Gergo Bogrnar; Peter Kovacs

- 11:45 *Transferability and Adversarial Training in Automatic Classification of the Electrocardiogram with Deep Learning (96)*
Arvid Eriksson; Thomas B. Schön; Antonio H. Ribeiro
- 12:00 *Multi-label Classification of Electrocardiogram Based on Label Distribution (163)*
Yuwen Li; Ben Wang; Chengyu Liu; Zhang Zhimin
- 12:15 *A Survey of Augmentation Techniques for Enhancing ECG Representation through Self-Supervised Contrastive Learning (223)*
Deekshith Reddy Dade; Jake Bergquist; Rob MacLeod; Ravi Ranjan; Benjamin A. Steinberg; Tolga Tasdizen

Whole Heart Modeling (S22)

Mon, Sep 9 11:00-12:30 in room Egon-Eiermann-Hörsaal (EEH)

Chairs: Blanca Rodriguez, Gernot Plank

- 11:00 *Gizmo – A Near Real-time Re-entrant Eikonal Based ECG Simulator (44)*
Matthias Gsell; Thomas Schrotter; Gernot Plank
- 11:15 *Calibration and Validation of a Healthy Human Baseline Electromechanical Model: Insights from Modelling and Simulation (390)*
Zhinuo Jenny Wang; Maxx Holmes; Ruben Doste; Julia Camps; Francesca Margara; Blanca Rodriguez
- 11:30 *Development of an Automated Pipeline for Large-Scale in Silico Trials in Electromechanical Patient-Specific Ventricular Models (400)*
Ruben Doste; Julia Camps; Zhinuo Jenny Wang; Lucas Arantes Berg; Marcel Beetz; Abhirup Banerjee; Vicente Grau; Blanca Rodriguez
- 11:45 *Anatomically Detailed Patient-specific Closed-loop Modeling of Heart-pacemaker Interaction (140)*
Niccolò Biasi; Paolo Seghetti; Davide Matteo Vultaggio; Marco Laurino; Alessandro Tognetti
- 12:00 *Selecting Cardiac Resynchronization Therapy Strategy for Left Bundle Branch Block at Different Levels: In Silico Comparative Study (349)*
Lev Malishevskii; Arsenii Dokuchaev; Stepan Zubarev; Dmitry Lebedev; Olga Solovyova
- 12:15 *Implications of IUGR-related heart geometric changes on electrophysiology: an in silico perspective (462)*
Freddy L Bueno-Palomeque; Ernesto Zacur; Esther Pueyo; Fàtima Crispí; Pablo Laguna; Ana Mincholé

Special Session. Photoplethysmography Imaging (S23)

Mon, Sep 9 11:00-12:30 in room Neuer Hörsaal (NH)

Chairs: Christoph Hoog Antink, Hannes Ernst

- 11:00 *Photoplethysmography Imaging – Future Prospects and Challenges (78)*
Christoph Hoog Antink; Hannes Ernst
- 11:30 *Morphology of PPGI Signals upon Stimulation (203)*
Sebastian Zaunseder; Vincent Fleischhauer
- 11:45 *Across Frequency Bands: from the Central Oscillator to Slow Rhythms in Skin Perfusion via Photoplethysmography Imaging (141)*
Stefan Borik
- 12:00 *Applications of PPGI: from Incubator to Psychiatry (285)*
Markus Johannes Lüken; Steffen K. Leonhardt

Cardiovascular Magnetic Resonance (S24)

Mon, Sep 9 11:00-12:30 in room Jordan-Hörsaal (Jordan)

Chairs: Cristiana Corsi, Cristian Linte

- 11:00 *DeepValve: the first automatic detection pipeline for the mitral valve in cardiac magnetic resonance imaging (114)*
Giulia Monopoli; Daniel Haas Becattini Lima; Nickolas Forsch; Vajira Thambawita; Gabriel Balaban; Mary M. Maleckar
- 11:15 *4D Flow MR Imaging for Blood Velocity Field Validation: A Preliminary Study in Atrial Fibrillation Patients (181)*
Camilla Cortesi; Matteo Falanga; Perrine Marsac; Nadjia Kachenoura; Cristiana Corsi
- 11:30 *Impact of electrical cardioversion on cavotricuspid trajectory differentials: a machine-learning approach to ablation of typical atrial flutter within an interventional MRI (198)*
Andrei Alexandru Mircea; Agathe De Cidrac; Jorge Solana Muñoz; Adrian Luca; Leo Gribinski; Cheryl Teres; Ingo Paetsch; Cosima Jahnke; Juerg Schwitter; Etienne Pruvot
- 11:45 *Minimalist Approach to 3-D Heart Modeling: A Novel Morphing Algorithm Relying on Four Anatomical Landmarks (276)*
Mhd Jafar Mortada; Agnese Sbröllini; Laura Burattini; Peter M. van Dam
- 12:00 *Self-gated ASL perfusion mapping of myocardium using MRI (345)*
Jiri Vitous; Ondrej Macicek; Radovan Jirik
- 12:15 *Pulmonary Capillary Wedge Pressure Estimation Using Statistical Shape Models (465)*
Abhijit Adhikary; Adelaide De Vecchi; Pablo Lamata

ECG Analysis in Atrial Arrhythmias (S31)

Tue, Sep 10 08:30-10:00 in room Fritz-Haller-Hörsaal (FHH)

Chairs: Joao Salinet, Frida Sandberg

- 08:30 *Post-Stroke Atrial Fibrillation Predicted By P-wave Variability Analysis From a Single-Lead ECG (90)*
Federica Ricci; Massimiliano Rizzo; Eugenio Mattei; Giovanni Calcagnini; Stefano Strano; Federica Censi
- 08:45 *Improved Detection of Paroxysmal Atrial Fibrillation Using an ECG-based Semisupervised Model (365)*
Sara Artal; Juan Pablo Martínez; Antonio Miguel; Julia Ramírez
- 09:00 *Evidential Deep Learning Model for Atrial Fibrillation Detection from Holter Recordings (384)*
Md Moklesur Rahman; Massimo W Rivolta; Pierre Maison Blanche; Fabio Badilini; Roberto Sassi
- 09:15 *Comparing RR-Interval-Based and Whole-Signal-Based Machine Learning Models for Atrial Fibrillation Detection from Single-lead Electrocardiograms (59)*
Zixuan Ding; Jonathan Mant; James Brimicombe; Tommaso Bucci; Benjamin JR Buckley; Peter Calvert; Wern Yew Ding; Andrew Dymond; Gregory Lip; Riccardo Proietti; Kate Williams; Elena Punskeya; Peter H. Charlton
- 09:30 *Learning Discriminative Representations of Superimposed P Waves With Weakly Supervised Temporal Contrastive Learning (267)*
Jakub Hejc; Richard Redina; David Pospisil; Jana Kolarova; Zdenek Starek
- 09:45 *Improved Prediction of Atrial Fibrillation by Identifying ECG Patient Trajectories Over Time (291)*
Myrte Barthels; Henri Gruwez; Thomas De Cooman; Noella Pierlet; David Duncker; Pieter Vandervoort

Cellular and Tissue Models (S32)

Tue, Sep 10 08:30-10:00 in room Egon-Eiermann-Hörsaal (EEH)

Chairs: Beatriz Trenor, Molly Maleckar

- 08:30 *Sinoatrial node heterogeneity and fibrosis increase robustness of atrial driving in a computational human tissue model (116)*
Eugenio Ricci; Fazeelat Mazhar; Moreno Marzolla; Stefano Severi; Chiara Bartolucci
- 08:45 *In Silico Simulation of Mouse Atrioventricular Conduction Including Sinus Node and Atrial Myocardium (123)*
Diego Gazzoni; Eugenio Ricci; Chiara Bartolucci; Stefano Severi
- 09:00 *Simulation of Cardiac Contractility Modulation with Single Cell Action Potential Human Models (405)*
Chiara Bartolucci; Stefano Severi
- 09:15 *Beat-to-Beat Variability in Computational hv-CM and hiPSC-CM Models (176)*

Venla Koivunen; Teemu Pukkila; Jari A. Hyttinen; Esa Rasanen;
Jussi T. Koivumäki

09:30 *Effects of Optogenetic Defibrillation on Cardiac Electrophysiology (202)*

Sophia Ohnemus; Linda Tillert; Johannes Vierock; Peter Kohl; Franziska Schneider-Warme; Viviane Timmermann

09:45 *Primary and Secondary Effects of IKur Block Response During Atrial Fibrillation and its Rate Dependency (182)*

Fazeelat Mazhar; Chiara Bartolucci; Stefano Severi

Heart Rate Variability (S33)

Tue, Sep 10 08:30-10:00 in room Neuer Hörsaal (NH)

Chairs: Roberto Sassi, Esa Räsänen

08:30 *Siamese Neural Networks for IUGR identification in Cardiotocographic recordings (280)*

Giulio Steyde; Luca Subitoni; Edoardo Spairani; Giovanni Magenes; Maria G. Signorini

08:45 *Singular Value Decomposition Entropy Analysis and Deep Learning models based on Genetic Algorithms for early diagnosis of Fetal Arrhythmia (150)*

Zayd Isaac Valdez; Luz Alexandra Díaz; Miguel Vizcardo; Antonio Gabriel Ravelo-García; SantiagolsmaelFlores SantiagolsmaelFlores SantiagolsmaelFlores

09:00 *The Case of Ties in Bubble Entropy (172)*

George Manis; Dimitrios Platakis; Roberto Sassi

09:15 *Assessing Autonomic Balance in Peripheral Arterial Disease Patients: A Generalized Multiscale Entropy Analysis of Heart Rate Variability (368)*

Oscar Barquero-Perez; Eva Cirugeda; Luis Alvarez-Jeronimo; Rebeca Goya-Esteban; Elena Sarabia-Cachadía; Alberto Sanchez-Sixto; Blanca de la Cruz-Torres; Jose Naranjo-Orellana

09:30 *Unique RR Interval Dynamics Preceding Sudden Cardiac Death (269)*

Teemu Pukkila; Jussi Aleksi Hernesniemi; Matti Molkkari; Matias Kanninen; Kjell Nikus; Terho J. Lehtimäki; Esa Rasanen

09:45 *Non-invasive Total Serum Bilirubin Estimation in Preterm Infants with Modified Mixed-Effect Random Forest (120)*

Meng Chen; Alain Beuchee; Fabrice Tudoret; Alfredo Hernandez

Cardiac Vibration Signals (S34)

Tue, Sep 10 08:30-10:00 in room Jordan-Hörsaal (Jordan)

Chairs: Kouhyar Tavakolian, Samuel Schmidt

- 08:30 *Model-Based Analysis of the Ballistocardiogram Signal During Obstructive and Central Apnea (234)*
Arthur Ben-Tolila; Virginie Le Rolle; Alfredo Hernandez
- 08:45 *Evaluating Piezoelectric Ballistocardiography for Post-Surgical Heart Rate Monitoring (309)*
Sepehr SeifiZarei; Ismail M. Elnaggar; Lars Rikken; Stephan Linckens; Enrico Toffoli; Ine Vandewauw; Marcel CG van de Poll; Antti Airola; Matti Kaisti; Margreet de Kok; Tero Koivisto
- 09:00 *Feasibility of 24-hour Monitoring and Circadian Analysis of the Cardiac Electro-Mechanical Activity Using Wearable Inertial Sensors (350)*
Federica Mozzini; Sarah Solbiati; Emanuela Teresa Locati; Enrico Caiani
- 09:15 *Separation Of The Valvular Contribution To Heart Sounds Through Blind Source Separation In Multi-Channel Phonocardiography (246)*
Noemi Giordano; Silvia Cannone; Gabriella Balestra; Samanta Rosati; Marco Knaflitz
- 09:30 *Mapping the Impact of Breast Tissue on Wearable Phonocardiography (184)*
Nirmani Nayanathara Rathnayake; Andrew McDonald; Maximilian Nussbaumer; Anurag Agarwal
- 09:45 *A database of synchronously recorded electrocardiograph, phonocardiograph, photoplethysmograph and accelerometer signals at different heart rates (147)*
Jovana Petrovic; Predrag Tadić; Marija Ivanovic; Masa Tiosavljevic; Vladimir Atanasoski; Aleksandar Lazovic; Ljupčo Hadžievski; Arsen D. Ristic; Vladan D. Vukcevic

Special Session. Open Questions in Open Research in Cardiovascular Data Science (S41)

Tue, Sep 10 10:30-12:00 in room Fritz-Haller-Hörsaal (FHH)

Chairs: Peter H. Charlton, Sharon Yuen Shan Ho

- 10:30 *Past, present and Future Challenges in Sharing Science: From PhysioNet to Foundation Models (39)*
Gari Clifford
- 11:00 *Open Science to Foster Progress in Automatic ECG Analysis: Status and Future Directions (57)*
Nils Strodthoff
- 11:15 *Listening to the Heart: Unifying Open Audio Databases for Cardiology Research (23)*
Jing Han; Erika Bondareva; Tomasz Jadczyk; Cecilia Mascolo
- 11:30 *Uncertainty in PPG-Based Cuffless Blood Pressure Trend Monitoring: A Personalized Approach (98)*

Mantas Rinkevicius; Peter H. Charlton; Vaidotas Marozas

Modeling Atrial Arrhythmias (S42)

Tue, Sep 10 10:30-12:00 in room Egon-Eiermann-Hörsaal (EEH)

Chairs: Natalia Trayanova, Simone Pezzuto

10:30 *Effect of Fiber Direction and ionic heterogeneities in atrial driver location (264)*

Javier Barrios Álvarez de Arcaya; María Termenón Rivas; Giada Sira Romitti; Alejandro Liberós; Miguel Rodrigo

10:45 *A Full Physics Real-Time Solver for Simulating Arrhythmias in the Human Heart (412)*

Thomas Schrotter; Matthias Gsell; Aurel Neic; Gernot Plank

11:00 *Global Sensitivity Analysis of Left Atrial Electrophysiology Models (115)*

Mariya Mamajiwala; Cesare Corrado; Steven Niederer; Richard Wilkinson; Richard H. Clayton

11:15 *From Clinic to Computation: Mapping Novel Electrophysiologic AF Metrics to Computational Models via Gaussian Process Emulation (71)*

Dhani Dharmapranj; Caroline Roney; Steven Niederer; Anand Ganesan

11:30 *Dyssynchrony Between Endo- and Epicardial Activation in a Bilayer Model of the Left Atrium with Heterogeneous Endoepicardial Dissociation (146)*

Elham Zakeri Zafarghandi; Vincent Jacquemet

11:45 *Design of engineered heart tissues to minimize arrhythmic risk after implantation in infarcted hearts (376)*

Ricardo Maximiliano Rosales; Manuel Doblare; Manuel M. Mazo Vega; Esther Pueyo

Cardiovascular Variability (S43)

Tue, Sep 10 10:30-12:00 in room Neuer Hörsaal (NH)

Chairs: George Manis, Virginie Le Rolle

10:30 *Joint Analysis of Cardiovascular Control and Shear Wave Elastography to Assess the Vulnerability of Carotid Artery Plaque (233)*

Vlasta Bari; Beatrice Cairo; Francesca Gelpi; Fabiana Fancoli; Nicoletta Curcio; Giulia Matrone; Giovanni Nano; Alberto Porta; Daniela Mazzaccaro

10:45 *An Approach to Decompose the Information Shared between Cardiovascular and Respiratory Physiological Systems (351)*

Chiara Bara; Yuri Antonacci; Michal Javorka; Luca Faes

11:00 *Real-Time Respiratory Event Detector Based on a Gated Recurrent Unit (213)*

- Pierre Hayek; Jeremy Beaumont; Jean-Louis D. Pepin; Virginie le Rolle; Alfredo Hernandez
- 11:15 *A Computational Method for Empirically Validating Synchronisation Between Musical Phrase Arcs and Autonomic Variables (380)*
Natalia Cotic; Vanessa Clare Pope; Mateusz Solinski; Pier Lambiasi; Elaine Chew
- 11:30 *Differences in Exercise Capacity of Heart Failure and Chronic Obstructive Pulmonary Disease Patients Undergoing Exercise Rehabilitation (166)*
Ganesh Raam Kumarasamy; H el ene De Canni ere; Julie Deckers; Daimy Roebroek; Julie Vranken; Peter Karsmakers; David Ruttens; Pieter Vandervoort
- 11:45 *A Mathematical Model for Skin Sympathetic Nerve Activity Simulation (239)*
Runwei Lin; Gozewijn Dirk Laverman; Ying Wang

Ventricular Arrhythmias in Experiment and in silico Models (S44)

Tue, Sep 10 10:30-12:00 in room Jordan-H orsaal (Jordan)

Chairs: Cees Swenne, Mark Potse

- 10:30 *Analysis of Phase Singularities in Experimental Optical Mapping Data of Isolated Rat Hearts Experiencing Ventricular Fibrillation Using Phase Mapping and Directed Graph Mapping (99)*
Sebastiaan Lootens; Nele Vandersickel; Vineesh Kappadan; Fu Siong Ng
- 10:45 *A Computational Method for the Analysis of Fast and Transient Regimes that Determine Arrhythmia Formation and Termination (300)*
Aaron Gobeyn; Desmond Albert Kabus; Elena G. Tolkacheva; Hans Dierckx
- 11:00 *Quantification of Delayed Activation in Right Ventricular Outflow Tract in Brugada Patients (364)*
Sofia Romagnoli; Alba Isabel Roquero; Flavio Palmieri; Jose Daniel Fernandez-Font; Esther Pueyo; Pedro Gomis; Pablo Laguna; Elena Arbelo Lainez; Ana Minchol e
- 11:15 *Phase-2 Reentry Without Heterogeneity in Brugada Syndrome: Insights from Human Heart Experiments (454)*
Ilija Uzelac; Flavio Fenton
- 11:30 *Propagation Direction for Enhanced Accessory Pathway Localization: In Silico Heart Model Evaluation (470)*
Adrian Marti Roig; Karli Gillette; Elisa Ramirez; Francisco Castells; Jose Millet; Gernot Plank
- 11:45 *Computational Analysis of the Effects of Acute Myocardial Ischemia on Cardiac Electrophysiology (101)*
Alessandra Corda; Stefano Pagani; Christian Vergara

Beyond Academia: Career Paths for PhDs and Early-Stage Researchers in Industry (SC)

Tue, Sep 10 12:15-12:45 in room Math, SR1.067 (MathSR)

Chairs: Marianna Meo

Photoplethysmography (S51)

Tue, Sep 10 13:00-14:30 in room Fritz-Haller-Hörsaal (FHH)

Chairs: Peter H. Charlton, Vlasta Bari

13:00 *Modeling-based Radial Pressure Waveform Reconstruction using Photoplethysmography Signals (332)*

Jérôme Diaz; François Kimmig; Fabrice Vallée; Arthur Le Gall; Romain Kirszenblat; Marie Willemet; Philippe Moireau

13:15 *MSPTDfast: An Efficient Photoplethysmography Beat Detection Algorithm (45)*

Peter H. Charlton; Jonathan Mant; Panicos A. Kyriacou

13:30 *Development of a Ring-Shaped Pulse Oximeter to Analyse Angle Dependency in SpO₂ Estimation (260)*

Lara J. Reichelt; Idoia Badiola; Vladimir Blazek; Steffen K. Leonhardt; Markus Johannes Lüken

13:45 *Smartwatches in Clinical Pre-diagnosis: Enhancing Tilt Test Analysis for Prolonged COVID-19 Symptoms (407)*

Ana Leticia Gomes dos Santos; Samuel Minucci Camargo; William Tsutomu Watanabe; Stella Tassinari Maximo; Kelly Correa Baioco Da Silva; Christian Goncalves Sassaki; Jose L. Puglisi; Daniel Gustavo Goroso

14:00 *Lab vs. Real-world PPG Characterization for Blood Pressure Stratification in Healthy Individuals (438)*

Marcello Sicbaldi; Serena Moscato; Luca Palmerini; Alessandro Silvani; Igor Diemberger; Lorenzo Chiari

14:15 *Towards Remote Blood Pressure Estimation Using RGB Cameras (404)*

Matthieu Scherpf; Hannes Ernst; Hagen Malberg; Martin Schmidt

ECG Analysis in Ischemia and Repolarization (S52)

Tue, Sep 10 13:00-14:30 in room Egon-Eiermann-Hörsaal (EEH)

Chairs: Laura Bear, Jorge Sánchez

13:00 *Machine Learning Estimation of Myocardial Ischemia Severity Using Body Surface ECG (144)*

Rui Jin; Jake Bergquist; Deekshith Reddy Dade; Brian Zenger; Ravi Ranjan; Benjamin A. Steinberg; Tolga Tasdizen; Rob MacLeod

13:15 *Baseline Drifting Removal Affects Microvolt T-Wave Alternans Measurement (386)*

- Thais Winkert; Paulo Roberto Benchimol-Barbosa; Jurandir Nadal
- 13:30 *Evaluating the quality of CycleGAN generated ECG data for myocardial infarction classification (457)*
Sara Battiston; Roberto Sassi; Massimo W Rivolta
- 13:45 *Adversarial Multitask Learning Reduces the Correlation Between Age and Deep Learning Predictions of Myocardial Infarction from Electrocardiograms (451)*
Silvia Ibrahimi; Massimo W Rivolta; Roberto Sassi
- 14:00 *Dynamics of T-peak-to-T-end Morphology Changes in an Open-chest Porcine Model, and its Relation to Arrhythmic Events (453)*
Neurys Gómez Fonseca; Julia Ramírez; Alena S. Tsvetkova; Pyotr Platonov; Jan Azarov; Juan Pablo Martínez; Pablo Laguna
- 14:15 *Comparing Predictive Models for AF Recurrence Post-Catheter Ablation: CHA2DS2-VASc Score vs. HRV-Derived Features from Implantable Cardiac Monitors (328)*
Javier Saiz-Vivo; Mirko de Melis; Yong K. Cho

Atrial Signal Analysis (S53)

Tue, Sep 10 13:00-14:30 in room Neuer Hörsaal (NH)

Chairs: Ismael Hernández, Miguel Rodrigo

- 13:00 *Surface ECG Analysis for Non-invasive Diagnosis of Atrial Cardiomyopathy - Clinical Implications and Methods (494)*
Martin Eichenlaub
- 13:30 *P Wave Characterization during Respiratory Events in Sleep Apnea Patients with and without Paroxysmal Atrial Fibrillation (241)*
Luca Cerina; Maarten Jlpn van den Broek; Gabriele Papini; Sebastiaan Overeem; Lukas Dekker
- 13:45 *Wavelet based denoising of fractionated EGM signals (157)*
Tanger Niklas; Dylan Vermoortele; Hans Dierckx; Peter Haemers; Piet Claus
- 14:00 *Characterization of Cardiac Tissue by Heterogeneity Using High-Density Grid Catheter: Validation in porcine model (358)*
Lucía Ronda; Elisa Ramirez; Jose Millet; Martin Pesl; Samuel Ruiperez-Campillo
- 14:15 *Exploring ICA for Differentiating Intracavitary Signals Based on Tissue Composition (379)*
Raúl Alós; Elisa Ramirez; Samuel Ruiperez-Campillo; Raul Llinares; Francisco Castells; Jakub Hejc; Martin Pesl; Zdenek Starek; Jose Millet

PhysioNet Challenge I (S54)

Tue, Sep 10 13:00-14:30 in room Jordan-Hörsaal (Jordan)

Chairs: Gari Clifford, Matthew Reyna

- 13:00 *Digitization and Classification of ECG Images: The George B. Moody PhysioNet Challenge 2024 (11)*
 Matthew A. Reyna; James Tyler Weigle; Deepanshi Deepanshi; Andoni Elola; Kiersten S. Campbell; Salman Seyedi; Zuzana Koscova; Gari Clifford; Reza Sameni
- 13:15 *A modular framework for the interpretation of paper ECGs (118)*
 Sara Summerton; Tuija Leinonen; George Searle; Matti Kaisti; David C. Wong
- 13:30 *Transformer-Based Deep Learning Approach for the Digitization and Classification of Physical ECG Paper Images (159)*
 Mohanad Alkhodari; Mostafa Mohamed Moussa; Leontios J. Hadjileontiadis; Ahsan Khandoker
- 13:45 *Enhanced ECG Signal Classification and Reconstruction Using Deep Features and Extra Trees Classifier (222)*
 Ruhallah Amandi
- 14:00 *Dual Deep Learning System to Digitalize and Classify 12-Lead ECGs from Scanned Images (224)*
 ChunTi Chou; Sergio González Vázquez
- 14:15 *WAVIE: A Modular and Open-Source Python Implementation for Fully Automated Digitisation of Paper Electrocardiograms (229)*
 Mathilde A. Verlyck; Joshua R. Dillon; Stephen A. Creamer; Debbie Zhao

ML and Clinical Applications (S61)

Tue, Sep 10 14:45-16:15 in room Fritz-Haller-Hörsaal (FHH)

Chairs: Alfredo Hernández, Pedro Gomis

- 14:45 *AI from the clinical perspective (491)*
 Benjamin Meder
- 15:15 *Sex-Specific, Multi-Modal Assessment of Cardiac Function in Type 2 Diabetes Using the UK Biobank (406)*
 Ambre Bertrand; Andrew Lewis; Vicente Grau; Blanca Rodriguez
- 15:30 *Interpretable Clustering for Patient Phenotyping using Advanced Machine Learning Models (16)*
 Roy S. Zawadzki; Saman Parvaneh
- 15:45 *Explainable AI analysis of a prediction model for detecting premature atrial and ventricular complexes (88)*
 Pedro Moreno-Sánchez; Guadalupe García Isla; Valentina Corino; Mark van Gils; Luca Mainardi
- 16:00 *Prediction of In-Hospital Atrial Fibrillation After Acute Myocardial Infarction (327)*
 Matteo Bulloni; Guadalupe García Isla; Pedro Moreno-Sánchez; Erica Rurali; Alice Bonesi; Mattia Chiesa; Pablo Werba; Giancarlo Marenzi; Valentina Corino; Claudio Tondo; Mark van Gils; Linda Pattini; Luca Mainardi

ML and Signal Processing Applications (S62)

Tue, Sep 10 14:45-16:15 in room Egon-Eiermann-Hörsaal (EEH)

Chairs: Shijie Zhou, Óscar Barquero

14:45 *Cross-Modal Attention Fusion of Electrocardiogram Emotion and Voiceprint for Depression Detection (183)*

Minghui Zhao; Lulu Zhao; Hongxiang Gao; Keming Cao; Zhijun Xiao; Feifei Chen; Zhaoyang Cong; Jianqing Li; Chengyu Liu

15:00 *Machine Learning Prediction of Blood Potassium at Different Time Cutoffs (145)*

Jake Bergquist; Deekshith Reddy Dade; Brian Zenger; Ravi Ranjan; Rob MacLeod; Benjamin A. Steinberg; Tolga Tasdizen

15:15 *Prediction of Sex From a 12-lead ECG Using Deep Learning: External Validation and Interpretation (288)*

Myrte Barthels; Henri Gruwez; Thomas De Cooman; Noella Pierlet; David Duncker; Pieter Vandervoort

15:30 *Study of dry electrode ECG signal characteristics towards explainable AI (151)*

Abdelrahman Abdou; Niraj Mistry; Sri Krishnan

16:00 *Identification of abdominal ECG lead location over fetal development for non-invasive single channel W-NETR fetal ECG extractor (395)*

Murad Almadani; Leontios J. Hadjileontiadis; Ahsan Khandoker

Atrial Mapping (S63)

Tue, Sep 10 14:45-16:15 in room Neuer Hörsaal (NH)

Chairs: Olaf Dössel, Karli Gillette

14:45 *Topology-guided Ablation of Atrial Tachycardia (17)*

Robin Van Den Abeele; Sander Hendrickx; Mattias Duytschaever; Nele Vandersickel

15:00 *Uncertainty Quantification of Fibrotic Conductivity Effects on Digital Twin-Derived Ablation of Atypical Left Atrial Flutter (21)*

Jake Bergquist; Ben A. Orkild; Eric N. Paccione; Eugene Kwan; Brian Zenger; Rob MacLeod; Akil Narayan; Ravi Ranjan

15:15 *Panoramic Optical Frequency Mapping Characterization of Atrial Arrhythmias Induced in Isolated Rabbit Hearts (209)*

Italo Sandoval Ramos de Oliveira; Jimena Gabriela Siles Paredes; Vinicius de Paula Silva; Tainan Cerqueira Neves; Angélica Drielly Quadros; Jose Carlos Pachon-M; Ilija Uzelac; Joao Salinet

15:30 *Physics-informed Neural Networks to Reconstruct Phase Maps during Cardiac Arrhythmias (315)*

Francisco Sahli Costabal; Simone Pezzuto

- 15:45 *Functional and Structural Differences in Fibrosis Determine Atrial Fibrillation Inducibility (414)*
Eugene Kwan; Bram Hunt; Eric N. Paccione; Ben A. Orkild; Jake Bergquist; Kyoichiro Yazaki; Edward W. Hsu; Irina Polejaeva; Derek Dossall; Rob MacLeod; Ravi Ranjan
- 16:00 *Comparative Characterization of Electrical and Panoramic Optical Mapping in Langendorff-Perfused Rabbit Hearts: From Sinus Rhythm to Fibrillation (425)*
Jimena Gabriela Siles Paredes; Ilija Uzelac; Tainan Cerqueira Neves; Vinicius de Paula Silva; Angélica Drielly Quadros; Italo Sandoval Ramos de Oliveira; Giovanni Lazzarin Weber; Jose Carlos Pachon-M; Joao Salinet

PhysioNet Challenge II (S64)

Tue, Sep 10 14:45-16:15 in room Jordan-Hörsaal (Jordan)

Chairs: Gari Clifford, Matthew Reyna

- 14:45 *Digital signal and image-based ECG classification and its performance by modern residual convolutional networks (231)*
Ľubomír Antoni; Erik Bruoth; Peter Bugata; Peter Bugata Jr.; Dávid Gajdoš; Dávid Hudák; Vladimíra Kmečová; Manohar Gowdru Shridhara; Monika Staňková; Gabriela Vozáriková; Ivan Žežula
- 15:00 *Driving ECG digitization - Using Techniques from Autonomous Driving to Detect Regions of Interest in ECG Images (247)*
Philip Hempel; Nicolai Spicher
- 15:15 *U-Net Guided Digitization of 12-Lead Printed ECGs (265)*
Álvaro José Bocanegra; Etel Silva Garcia; Andrea Saglietto; Oscar Camara
- 15:30 *Text-to-ECG Generation and Image Style Transfer Helps ECG Images Digitalization and Classification (326)*
 Zisheng Liang; Shanwei Zhang; ; Qinghao Zhao; Deyun Zhang; Shijia Geng; Jun Li; Yuxi Zhou; Shenda Hong
- 15:45 *Image-Based Electrocardiogram Classification using Pre-trained ConvNext Models with Demographic Data (398)*
Felipe Meneguitti Dias; Estela Ribeiro; Quenaz Bezerra Soares; Jose Krieger; Marco Antonio Gutierrez
- 16:00 *Deep Learning Image Segmentation for Time-Series Reconstruction from ECG Images (481)*
Samer Jammoul; Abdullatif Hassan; Emily Zhang; Philip Warrick; Jonathan Afilalo

Cardiovascular Imaging (P71)

Tue, Sep 10 16:15-17:45 in room Math Foyer (Math)

Poster session¹

- 16:15 *Enhanced Automatic Coronary Sinus Veins Segmentation Model Based on Hausdorff Distance Loss Function and Multi-Architecture Neural Network Ensemble (remote) (19)*
Chiara Arduino; Stepan Zubarev; Margarita Budanova; Mikhail Chmelevsky; Sergei Rud; Aleksandr Sinitca
- 16:15 *Enhancing Cardiovascular Risk Prediction through Deep Learning Analysis of Chest Radiographs (remote) (30)*
Erdem Yanar
- 16:15 *Enhanced Automatic Segmentation of Epi-Endocardial Ventricular Anatomy Using Multi-Architecture Neural Network Ensemble (remote) (43)*
Chiara Arduino; Stepan Zubarev; Margarita Budanova; Mikhail Chmelevsky; Sergei Rud; Gennady Trufanov; Aleksandr Sinitca
- 16:15 *Automated Quantitative Analysis of Cardiac MR Short-Axis Cine Images in the NAKO Health Study: Segmentation Pipeline and Quality Control (remote) (46)*
Christopher Schuppert; Peter M. Full; Fabian Isensee; Manuel Hein; Maximilian F. Russe; Fabian Bamberg; Jeanette Schulz-Menger; Klaus Prof. Maier-Hein; Christopher L. Schlett; Nako Mri Study Investigators
- 16:15 *How does the dispersive patch affect the efficacy of radiofrequency ablation? (52)*
Minha Anees; Jose Guerra; Luca Gerardo Giorda; Argyrios Petras
- 16:15 *Exploring Pixel Value Scaling in the Application of Convolutional Neural Network U-Net Models for Segmentation of the Myocardium in Magnetic Resonance Images (93)*
Trygve Eftestøl; Mina Farmanbar; Tomas Royal Choat; Otto Nessa Ljosdal; Mathias Dyvik; Casper Cappelen; Vidar Frøysa; Jørn Kværness; Gøran Jansson Berg; Stein Ørn
- 16:15 *Segmentation of Late Gadolinium-Enhanced Cardiac Magnetic Resonance Images Based on Residual Attention Mechanisms (remote) (138)*
Zhaokai Kong; Zhenyin Fu; Yingyi Geng; Ling Xia; Ruiqing Dong; Jucheng Zhang; Dongdong Deng
- 16:15 *Improving Myocardial Scar Segmentation with End-to-End and Cascaded CNN using Hybrid Loss and Multi-Modality CMR Imaging (148)*
Farheen Ramzan; Chen Chen; Richard H. Clayton

¹Those marked as *Remote* did not indicate in person presentation by the date of printing but may still be presented onsite.

Cardiovascular Mechanics (P72)

Tue, Sep 10 16:15-17:45 in room Math Foyer (Math)

Poster session¹

- 16:15 *Estimation of Cardiac Contractility Using Work-Loop End-Systolic Relations is Problematic (22)*
Kenneth Tran; Andrew Taberner; Toan Pham; June-Chiew Han
- 16:15 *Investigating the Impact of Parameter Selection on Reentry Characteristics in a 3D Slab Simulation (remote) (153)*
 Chuxin Zhang; Zhaokai Kong; Zhenyin Fu; Yingyi Geng; Ling Xia; Ruiqing Dong; Jucheng Zhang; Dongdong Deng
- 16:15 *Heart Failure Prediction in Patients with Remotely Monitored Implanted Cardiac Devices: a Multiparametric Model (164)*
 Eleonora Malloni; Alberto Bandini; Matteo Falanga; Stefano Severi; Cristiana Corsi
- 16:15 *Optimization of Patient-specific Mitral Valve Model Using CFD Simulation and Machine Learning (171)*
 Yingyi Geng; Yue Wang; Zhenyin Fu; Zhaokai Kong; Ruiqing Dong; Dongdong Deng; Jucheng Zhang; Ling Xia
- 16:15 *Skeletal muscle transcriptional dysregulation of genes involved in senescence is associated with prognosis in severe heart failure (255)*
Alen Lovric; Eric Rullman

Ventricular Arrhythmias (P73a)

Tue, Sep 10 16:15-17:45 in room Math Foyer (Math)

Poster session²

- 16:15 *Markers of self-organized criticality in atrial and ventricular fibrillation (70)*
Dhani Dharmapranjani; Feng Xiong; Sobhan Salari Shahrbabaki; Evan Jenkins; Darius Chapman; Campbell Strong; Ivaylo R. Tonchev; Luke P. O'Loughlin; Lewis Mitchell; Martyn P. Nash; Richard H. Clayton; Anand Ganesan
- 16:15 *Ventricular Fibrillation Dynamics: Manifold Learning and Neural Network Approach (106)*
Dafne Lozano Paredes; Juan José Sánchez Muñoz; Luis Bote-Curiel; Francisco-Manuel Melgarejo-Meseguer; Antonio Gil Izquierdo; Francisco-Javier Gimeno-Blanes; Jose Luis Rojo-Alvarez
- 16:15 *Personalisation Of Action Potentials Based On Activation Recovery Intervals In Post-Infarcted Pigs: A Simulation Study (132)*

¹Those marked as *Remote* did not indicate in person presentation by the date of printing but may still be presented onsite.

²Those marked as *Remote* did not indicate in person presentation by the date of printing but may still be presented onsite.

Jairo Rodriguez Padilla; Rafael Silva; Buntheng Ly; Mihaela Pop; Maxime Sermesant

16:15 *A Computational Model of the Sympathetic Neuron for Investigating New CPVT Drug Treatments (142)*

Finbar John Argus

16:15 *Effect of Scar Interpolation Methods on Simulated Ventricular Tachycardia in Infarcted Heart Models (263)*

Manisha Sahota; Fernando Campos; Steven E. Williams; Matthijs Cluitmans; Gernot Plank; Steven Niederer; Martin Bishop

16:15 *Measurements and changes in the ECG of patients suffering from Brugada syndrome: a longitudinal study (remote) (281)*

Alba Isabel Roquero; Monica Veenhoven; Jose Daniel Fernandez-Font; Pedro Gomis; Elena Arbelo Lainez; Flavio Palmieri

Atrial Signal Analysis (P73b)

Tue, Sep 10 16:15-17:45 in room Math Foyer (Math)

Poster session¹

16:15 *Phase Index Calculation for Anatomical Reentry Using Cross-correlation (54)*

Arthur Bezerra; Sander Hendrickx; Robin Van Den Abeele; Eike Moritz Wülfers; Bjorn Verstraeten; Sebastiaan Lootens; Arstanbek Okenov; Timur Nezlubinskii; Nele Vandersickel

16:15 *Non-Invasive Localization of Atrial Cardiomyopathy Using Body Surface Potential Maps and Graph Neural Networks (remote) (56)*

Maria Macarulla-Rodriguez; Jorge Sánchez; Cristian Alberto Barrios Espinosa; Axel Loewe; Ernesto Zacur; Andreu M. Climent; Maria de la Salud Guillem Sánchez

16:15 *Towards Trustworthy Atrial Fibrillation Classification from Wearables Data: Quantifying Model Uncertainty (68)*

Ciaran A. Bench; Nils Strodthoff; Philip Aston; Andrew J. Thompson

16:15 *Beat-to-beat In Silico Assessment of AV-nodal Conduction Dynamics during AF (83)*

Mattias Gustav Karlsson; Pyotr Platonov; Frida Sandberg; Mikael Wallman

16:15 *Correlation-based Estimation of Activation Frequency in Intracardiac and ECG signals during Atrial fibrillation (95)*

Duna De Luis Moura; María Termenón Rivas; Javier Barrios Álvarez de Arcaya; Giada Sira Romitti; Alejandro Liberos; Miguel Rodrigo

16:15 *Characterization of conduction velocity from intracavitary electrical recordings during atrial fibrillation (remote) (100)*

¹Those marked as *Remote* did not indicate in person presentation by the date of printing but may still be presented onsite.

- María Termenón Rivas; Javier Barrios Álvarez de Arcaya; Giada Sira Romitti; Alejandro Liberos; Miguel Rodrigo
- 16:15 *In-Silico Investigation of the Right and Left Atrial Contributions to the P-Wave Morphology in ECG of Healthy and Atrial Fibrillation Patients (122)*
Jakub Grzelak; Shaheim Ogbomo-Harmitt; Oleg Aslanidi
- 16:15 *A Comparison of Methods for Fiber Direction Estimation from Electrograms (131)*
Elena van Breukelen; Johannes Willem de Vries; Mathijs van schie; Natasja de Groot; Richard C. Hendriks
- 16:15 *An Innovative Approach to ECG Ventricular Activity Suppression in Persistent Supraventricular Tachycardia (168)*
Francisco-Manuel Melgarejo-Meseguer; Antonio Gil Izquierdo; Juan José Sánchez Muñoz; Francisco-Javier Gimeno-Blanes; arcadi Garcia; Jose Luis Rojo-Alvarez
- 16:15 *Dynamic changes in episodes of atrial fibrillation as predictors of permanent atrial fibrillation using implantable device (remote) (214)*
Raquel Cervigon; Maria Luz Dominguez; Silvia Perea; Miguel Fernandez; Francisco Castells; Samuel Ruiperez-Campillo; Jose Millet
- 16:15 *Peak-Based Spatio-Temporal Dispersion Classifier of Multipolar Intracardiac EGMs in Persistent Atrial Fibrillation (236)*
Sara Frusone; Fabien Squara; Vicente Zarzoso
- 16:15 *Patterns of Time-Evolving Frequencies on Surface ECG Predict Long-Term Outcome of Ablation in Atrial Fibrillation (242)*
Adrian Luca; Jean-Marc Vesin; Jorge Solana Muñoz; Andrei Alexandru Mircea; Mathieu Le Bloa; Cheryl Teres; Laurent Roten; Michael Kühne; Sven Knecht; Christian Sticherling; Patrizio Pascale; Etienne Pruvot
- 16:15 *Characterizing Surface Fibrillatory Waves Through the Lagged Poincaré Plot for Preoperative Prediction of Ablation Success in Persistent Atrial Fibrillation (259)*
Pilar Escribano Cano; Juan Ródenas; Manuel García; Flavia Ravelli; Michela Masè; Jose J Rieta; Raul Alcaraz
- 16:15 *CAPPA: Consistent Analysis of Action Potential Parameters for Various Types of Cardiomyocytes (273)*
Christian Goetz; Amelie Paasche; Felix Wiedmann; Manuel Kraft; Merten Prueser; Norbert Frey; Axel Loewe; Constanze Prof. Schmidt
- 16:15 *A Novel Deep-Learning Method for Fibrillatory Waves Extraction from Electrocardiograms (275)*
Luca Goffi; Agnese Sbröllini; Mhd Jafar Mortada; Micaela Morettini; Laura Bu-rattini

- 16:15 *Semi-Supervised Learning for Enhancing Ablation Outcomes in Persistent Atrial Fibrillation (297)*
Noor Qaqos; Fernando Soares Schindwein; Ekenedirichukwu Nelson Obianom; Shamsu Idris Abdullahi; Fan Feng; Abdulhamed Mohammed Jasim; G. Andre Ng; Xin Li
- 16:15 *Spectral Analysis for Slow Pathway Characterization in Atrioventricular Nodal Reentry Tachycardia (361)*
Giorgia Bongiovanni; Matteo Fioravanti; Francesco Soliani; Antonio Crocamo; Francesca Notarangelo; Cristiana Corsi
- 16:15 *Bayesian P Wave Amplitude Estimation (474)*
Angie Wang; Seshadri Balaji; James McNames

Misc Pathologies with ECG (P74a)

Tue, Sep 10 16:15-17:45 in room Math Foyer (Math)

Poster session¹

- 16:15 *Assessment of instantaneous heart rate and accelerometry changes during 6-minute walk tests in pulmonary hypertension using a multi-modality patch (125)*
Xiaojuan Xia; Daniel Lachant; Jean-Philippe Couderc
- 16:15 *Identification of cardiac autonomic neuropathy progression from ECG signals using multiscaled crucial events and multifractal analysis (remote) (155)*
Sara Nasrat; Ahsan Khandoker; Herbert F. Jelinek
- 16:15 *Research on Electrocardiogram Patterns as Early Markers of Cognitive Decline in Elderly (remote) (160)*
Zhang Zhimin; Ben Wang; Jia Fei Dai; Yuwen Li
- 16:15 *Assessment of Ventricular Repolarization Variability in Wake States in REM Sleep Behaviour Disorder and Parkinson's Diseases (271)*
Parisa Sattar; Giulia Baldazzi; Nicla Mandas; Elisa Casaglia; Michela Figorilli; Laura Giorgetti; Pietro Mattioli; Francesco Calizzano; Francesco Fama; Dario Arnaldi; Danilo Pani; Pablo Laguna; Raquel Bailón
- 16:15 *An AutoML Pipeline for the Classification of Noisy and Clean Electrocardiogram Signals Using Bayesian Optimization (42)*
Lucia Billeci; Lorenzo Bachi; Chiara Podrecca; Maurizio Varanini; Pia Cincione
- 16:15 *Detecting Atrial Fibrillation from Reduced-Lead Electrocardiograms of Mobile Patches Using Interpretable Features (292)*
Alexander Hammer; Boris Schmitz; Hagen Malberg; Martin Schmidt
- 16:15 *Unraveling the Influence of Right Ventricle Presence on Paced ECGs (329)*

¹Those marked as *Remote* did not indicate in person presentation by the date of printing but may still be presented onsite.

- Fernando Campos; Cristobal Rodero; John Whitaker; Gernot Plank; Christopher Aldo Rinaldi; Martin Bishop
- 16:15 *Education the Spatial relation of the ECG (409)*
Kinga Gładys; Klaudia Proniewska; Danila Potyagaylo; Peter M. van Dam
- 16:15 *"Leveraging Cardiologists Prior-Knowledge and a Mixture of Experts Model for Hierarchically Predicting ECG Disorders" (477)*
Diogo Tuler Chaves; Jose Geraldo Fernandes; Gabriel Lemos dos Santos; Pedro Robles Dutenhefner; Turi Vasconcelos Rezende; Gisele Pappa; Gabriela Paixão; Antonio Luiz Ribeiro; Wagner Meira Jr
- 16:15 *Mapping Simulated ECG to Early Acute Kidney Injury Based on Electrolyte Disturbances (remote) (15)*
Jiaqi Liu; Yan Tong; Dongdong Deng; Ling Xia; Yang Li; Hanyu Zhu; Xiangmei Chen
- 16:15 *Estimation of Cardiac and Non-cardiac Discharge Diagnosis from Electrocardiogram Features (remote) (49)*
Juan Miguel Lopez Alcaraz; Nils Strodthoff
- 16:15 *Left Bundle Branch Block Detection in 12-Lead ECG using End-to-End Deep Learning with Explainability (67)*
Junmo An; Richard Gregg; Ben Bailey; Yu-He Zhang; Dillon J. Dzikowicz
- 16:15 *Cardiac Anatomical and Electrical Axes: Proposed Definitions and Interplay (69)*
Mohammad Kayyali; Ana Mincholé; Shuang Qian; Alistair Young; Devran Ugurlu; Elliot Fairweather; Steven Niederer; John Whitaker; Martin Bishop; Pablo Lamata
- 16:15 *Exploring the Impact of Left Ventricular Hypertrophy on ECG Morphology through Computational Modelling (91)*
Mohammadreza Kariman; Karli Gillette; Matthias Gsell; Anton J. Prassl; Gernot Plank; Christoph Augustin
- 16:15 *Into-the-Field Assessment of Maximal Heart Rate during Exercise (248)*
Agnese Sbrollini; Micaela Morettini; Laura Burattini
- 16:15 *Role of the Historical Electrocardiogram in Identifying Acute Coronary Syndrome (250)*
Agnese Sbrollini; Laura Burattini; Cees A. Swenne
- 16:15 *Automatic Analysis of Activation Recovery Interval in Heterogeneous Fibrotic Tissue from Chronically Infarcted Swine (417)*
Rafael Silva; Jairo Rodriguez Padilla; Mihaela Pop; Maxime Sermesant
- 16:15 *Using Dynamic Time Warping and Agglomerative Clustering of ECG data to group distinct PQRST morphologies in patients with Chagas Disease (446)*

- Carlos Magno Dantas de Figueirêdo Belém; João Paulo do Vale Madeiro
16:15 *Prediction of Coronary Artery Blood Flow Abnormalities Using MultiCNN-BiLSTM Model with Magneto-cardiogram (12)*
Cui Yangyang; Bai Guiyu; Yadan Zhang; Peilun Li; Xiang Min; Ziyuan Huang
16:15 *On Edge Wearable ECG Signal Quality Assessment using Residual Hermite Projection and Liquid State Machine, a Hierarchical Domain Adaptation Approach (130)*
Kaveh Samiee; Peter Kovacs

BSPM and ECGI (P74b)

Tue, Sep 10 16:15-17:45 in room Math Foyer (Math)

Poster session¹

- 16:15 *The Suggested Electrode Number in Electrocardiographic Imaging for Identifying Atrial Fibrillation Drivers (2)*
Yadan Zhang; Wu Jian; Xiang Min; Cui Yangyang
16:15 *A Threshold Method for Computing Activation Maps from Reconstructed Transmembrane Voltages (29)*
Emma Lagracie; Lisl Weynans; Yves Coudière
16:15 *Non-Invasive Dominant Frequency Characterization of Different Induced Arrhythmias in an Isolated Rabbit Heart Animal Model (211)*
Tainan Cerqueira Neves; Angélica Drielly Quadros; Jimena Gabriela Siles Paredes; Vinicius de Paula Silva; Italo Sandoval Ramos de Oliveira; Shiva Eghdamian; Jose Carlos Pachon-M; Ilija Uzelac; Joao Salinet
16:15 *Optimising Beat Selection and Averaging for ECGI to Enhance EGM Reconstruction Fidelity (218)*
Nikesh Bajaj; Kiran Haresh Kumar Patel; Job Stoks; Matthijs Cluitmans; Declan P. O'Regan; Pier Lambiase; Jesus Requena Carrion; Fu Siong Ng
16:15 *Continuous and Differentiable Propagation Velocities in Cardiac Models by Means of All-pass Filters (295)*
Erik Engelhardt; Norbert Frey; Gerhard Schmidt
16:15 *Evaluating the Effects of Respiration, Body orientation and Heart rate on Body Surface Potentials in Healthy Controls (318)*
Deepthi Priya Chandrasekaran; Iris van der Schaaf; Peter Loh; Johan De Bie; Peter M. van Dam; Manon M. Kloosterman
16:15 *Performance of Iterative Methods of ECGI in the Atria (356)*
Jorge Vicente Puig; Ismael Hernández-Romero; Raúl Moreno López; Clara Herrero Martín; Maria de la Salud Guillem Sánchez; Andreu M. Climent; Judit Chamorro-Servent

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- 16:15 *Multi-task Deep Neural Network for Intracardiac Activity Reconstruction in Atrial Fibrillation (410)*
Miriam Gutiérrez Fernández-Calvillo; Miguel Ángel Cámara-Vázquez; Ismael Hernández-Romero; Carlos Fambuena Santos; Maria de la Salud Guillem Sánchez; Andreu M. Climent; Karen Lopez Linares; Oscar Barquero-Perez

Cellular, Tissue and Whole Heart Models (P75)

Tue, Sep 10 16:15-17:45 in room Math Foyer (Math)

Poster session¹

- 16:15 *A model of drug effects on heart failure and hypertrophic cardiomyopathy in human ventricular cardiomyocytes (51)*
 Raquel Monllor-Parres; Carla Bascuñana; Jose M Ferrero
- 16:15 *Inducibility Tests of Atrial Fibrillation by Automata-based Efficient Simulations (remote) (104)*
Giada Sira Romitti; Alejandro Liberos; María Termenón Rivas; Javier Barrios Álvarez de Arcaya; Pau Romero; Dolors Almor Serra; Ignacio Garcia-Fernandez; Miguel Lozano; Rafael Sebastian; David Calvo Cuervo; Miguel Rodrigo
- 16:15 *"Influence of Conduction Velocity Restitution Steepness on Atrial Fibrillation Vulnerability and Maintenance" (105)*
Silvia Becker; Cristian Alberto Barrios Espinosa; Laura Anna Unger; Axel Loewe
- 16:15 *A Machine Learning Approach to the Personalization of Atrial Electrophysiological Models (remote) (119)*
 Marco Chen Bai; Giada Sira Romitti; Miguel Lozano; Ignacio Garcia-Fernandez; Miguel Rodrigo; Alejandro Liberos
- 16:15 *The Role of Population Size in Computational Assessment of Pharmacological Cardiotoxicity (143)*
Matteo Costi; Jose M Ferrero; Jose F Rodriguez Matas
- 16:15 *Compact Computer Model of Rabbit Atrioventricular Node with Autonomic Nervous System Control (remote) (162)*
Maxim Ryzhii; Elena Ryzhii
- 16:15 *Pharmacological Prevention of Paroxysmal Fibrillatory Episodes in 2D Atria Considering Atrial Dominant Frequency (remote) (251)*
Violeta Puche-García; Laura Martinez-Mateu; David Filgueiras-Rama; Lucía Romero; Javier Saiz
- 16:15 *Investigating the Influence of Parameters on Electrogram Morphology Using Gaussian Process Emulators (312)*

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- Manisha Sahota; Fernando Campos; Shuang Qian; John Whitaker; Steven E. Williams; Matthijs Cluitmans; Steven Niederer; Martin Bishop
- 16:15 *Stretch of the Papillary Muscle Insertion Region Triggers Reentrant Arrhythmia (320)*
Lena Myklebust; Giulia Monopoli; Mary M. Maleckar; Hermenegild Arevalo
- 16:15 *Study of the Influence of Atrial Dilatation on the Development of Atrial Fibrillation Through Its Modeling (337)*
Luisa Maria Gavier Moreno; Violeta Puche-García; Javier Saiz; Marcos Latorre
- 16:15 *The Role of Stellate Ganglion Induced Repolarization Heterogeneities in Post-Myocardial Infarction Arrhythmias: A Computational Approach (428)*
Javier Villar Valero; Lledo Nebot; Juan F. Gomez; Bastiaan J.D Boukens; Beatriz Trenor

Software Platforms (P76a)

Tue, Sep 10 16:15-17:45 in room Math Foyer (Math)

Poster session¹

- 16:15 *Graphics User Interface for Processing and Analyzing Cardiac Optical and Electrical Mapping Recorded During Animal Arrhythmic Models (360)*
Vinicius de Paula Silva; Tainan Cerqueira Neves; Angélica Drielly Quadros; Jimena Gabriela Siles Paredes; Ilija Uzelac; Joao Salinet
- 16:15 *Improving Patient Safety by Continuous Monitoring at Regular Wards (484)*
Antti Vehkaoja; Jarmo Verho; Anna Parviainen; Siri Sytelä; Juho Kuusela; Julius Jukka Olavi Alamäki; Markus T. Parviainen; Mikko Huopainen; Borje T. Rantala

Databases (P76a)

Tue, Sep 10 16:15-17:45 in room Math Foyer (Math)

Poster session²

- 16:15 *A database of simultaneously recorded ECG signals with and without electromyographic noise (362)*
Vladimir Atanasoski; Marija Ivanovic; Lana Popovic Maneski; Marjan Miletic; Milos Babic; Aleksandra Nikolic; Jovana Petrovic

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- 16:15 *Extension of the PhysioNet Brno University of Technology Smartphone PPG Database (55)*
 Andrea Nemcova; Radovan Smisek; Martin Vitek; Lucie Saclova; Marina Filipenska; Eniko Vargova; Pavlina Sikorova; Pavel Gálík; Oto Janousek; Lukas Smital

Heart Rate Variability (P77)

Tue, Sep 10 16:15-17:45 in room Math Foyer (Math)

Poster session¹

- 16:15 *An Automatic Multi-Head Self-Attention Sleep Staging Method Using Single-Lead Electrocardiogram Signals (8)*
Songlu Lin; Yuzhe Wang; Zhihong Wang
- 16:15 *Cardiorespiratory Coupling During Spinal Anesthesia Assessed via Causal Squared Coherence (10)*
Francesca Gelpi; Vlasta Bari; Beatrice Cairo; Maddalena Alessandra Wu; Valentina Palmaverdi; Beatrice Lazzari; Riccardo Colombo; Alberto Porta
- 16:15 *Autocorrelation function based signal quality assessment on photoplethysmographic recordings for opportunistic accurate estimation of RR time series (20)*
Miguel Angel Garcia-Gonzalez; Mahtab Mohammadpoorfashkodi; Mireya Fernandez Chimeno; Juan Jose Ramos-Castro
- 16:15 *The Impact of Heart Rate Data Filtering on Heart Rate Asymmetry Measures (40)*
Rafal W. Pawłowski; Katarzyna Buszko
- 16:15 *Can the Low-Frequency Component of the Maximal First Derivative of Arterial Pressure Waveform Indicate the Sympathetic Response to Isometric Exercise? (47)*
Alejandra Guillén-Mandujano; Salvador Carrasco-Sosa
- 16:15 *Active Standing Test Provokes Different Effects on the Variability of Diastolic and Systolic Electromechanical Subintervals (48)*
 Salvador Carrasco-Sosa; Alejandra Guillén-Mandujano; Aldo Rodrigo Mejía-Rodríguez
- 16:15 *Influence of Autonomic Nervous System Activity on Cerebral Autoregulation in Traumatic Brain Injury (87)*
Marc Goetting; Bernhard Meyer; Maximilian Schwendner; Sandro Krieg; Florian Tetschke; Hagen Malberg; Martin Schmidt
- 16:15 *ECG-based Deep Convolutional Recurrent Network with Attention Mechanism for Sleep Apnea Detection (remote) (109)*

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- Faustine Faccin; El-Hadi Djermoune; Laurent Bougrain; Pauline Guyot
16:15 *Beat-to-Beat Blood Pressure Variability for Long-term Risk Assessment (121)*
Ebenezer Tolman; Jessa Deckwa; Eddison Ivan Williams; Ethan Brovman; Timothy Ruchti

PhysioNet Challenge III (P78)

Tue, Sep 10 16:15-17:45 in room Math Foyer (Math)

Poster session¹

- 16:15 *Automated Conversion and Analysis of Printed ECG Using Random Signal Pretrained Digitizer (4)*
Jan Pavlus; Kristyna Pijackova; Petr Nejedly; Filip Plesinger
- 16:15 *Overcoming Modality Gaps: Self-Supervised Learning for Image-based Cardiovascular Disease Detection (remote) (73)*
Yeongyeon Na; Minje Park; Taehyung Yu; Jeonghwa Lim; Younghoon Ji; Sunghoon Joo
- 16:15 *Combining Hough Transform and Deep Learning Approaches to Reconstruct ECG Signals From Printouts (97)*
Felix H. Krones; Terry J. Lyons; Adam Mahdi; Benjamin Walker
- 16:15 *A Novel Multi-Task Learning Framework for Simultaneous Digitization and Classification of Electrocardiogram Images (remote) (128)*
Jingsu Kang; Hao Wen
- 16:15 *From Paper to Digital: ECG Processing with U-Net Digitization and ResNet Classification (remote) (134)*
Xiankai Yu; Yangcheng Huang; Jian Wu; Jiahao Wang; Wenjie Cai
- 16:15 *VinDigitizer: An Image Processing Approach to Digitize Paper ECG Records (remote) (135)*
Cuong V. Nguyen; Hieu Xuan Nguyen; Nhat Duong Anh; Cuong Do
- 16:15 *An electrocardiogram (ECG) digital system for the extraction and classification of paper-based ECG (158)*
; Yulin Sun; Leshui David; ; Runnan He; Xiuyun Liu
- 16:15 *ECGFusion: Adaptive Multi-Model Framework for Noise-Robust Digitization and Fine-Grained Classification of Paper ECGs (remote) (167)*
Runze Shen; ke jiang; ; sibo wang
- 16:15 *Comprehensive ECG classification using Tree Models and YOLOv8 (174)*
Shreyasvi Natraj; Diego Paez
- 16:15 *Automated Digitization of Paper ECG Records Using Convolutional Networks: a Faster R-CNN and U-Net Approach (199)*

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- Haoliang Shang; Clemens Hutter; Yani Zhang
 16:15 *GIRAFFE: Crafting Deep Learning Ensembles for Classifying ECG Paper Printouts (remote) (210)*
Damian Marek Kucharski; Arkadiusz Paweł Czerwiński; Agata Maria Wijata; Jacek Kawa; Yalin Zheng; Gregory Lip; Jakub Nalepa
- 16:15 *DeRC_ECG: Combined UNet-ResNet Framework for Automated Denoising and Classification of Noisy Paper-Based ECGs (remote) (225)*
Weijie Sun; Siqi Cao; Sunil V. Kalmady; Md Saiful Islam; Tayyib Ul Hassan; Abram Hindle; Russell Greiner; Padma Kaul
- 16:15 *Segmentation-based Extraction of Key Components from ECG Images: A Framework for Precise Classification and Digitization (remote) (227)*
Hong-Cheol Yoon; Dong-Kyu Kim; Hyun-Seok Kim; Woo-Young Seo; Chang-Hoe Heo; Sung-Hoon Kim
- 16:15 *ECG-DUaL: pose-invariant Digitization of printed electrocardiograms via U-net and Local edge detection (262)*
Elias Stenhede; Bjørn-Jostein Singstad; Arian Ranjbar
- 16:15 *Advanced Object Detection and Thresholding Techniques for ECG Digitalization Using YOLOv8 and Synthetic Training Data (remote) (272)*
 Martin Kropf; Dieter Hayn; Martin Baumgartner; Sai Pavan Kumar Veeranki; Fabian Wiesmueller
- 16:15 *Automated Digitization of Paper-Based ECGs: A Methodological Approach Enhanced by Denoising Autoencoders (remote) (277)*
Chaithanya Kalyan Reddy Bhuma; Subhash Khambampati; Sushanth Reddy Dondapati; Tejo Vardhan Kattamuri; Bharadwaj Madiraju; Kunal Achintya Reddy Seerapu; Rahul Krishnan Pathinarupothi
- 16:15 *Hybrid Approach for Electrocardiogram Images Classification: Residual Network and Random Forest (343)*
Jingzhi Gong; Noor Qaqos; Chintan Patel; Ekenedirichukwu Nelson Obianom; Shamsu Idris Abdullahi; Fan Feng; Abdulmalik Koya; Abdulhamed Mohammed Jasim; Zaid A. Abod; G. Andre NG; Xin Li
- 16:15 *Enabling ECG Digitization and Classification with Hierarchical End-To-End Training (370)*
Tizian Claus Dege; Maurice Rohr; Christoph Hoog Antink
- 16:15 *Leveraging Binarized Generated Images for Enhanced Denoising and Digitization of Scanned ECGs (372)*
Rafael Silva; Yingyu Yang; Maëlis Morier; Safaa Al-Ali; Maxime Sermesant
- 16:15 *Efficient End-to-End Neural Network Architecture for Denoising-Extraction-Classification on ECG Images (remote) (375)*
Zirui Wang; Sunxiaohe Li; Yizhuo Feng; Yang Liu

- 16:15 *A Versatile, Advanced Framework for Enhanced Multi-Label ECG Classification Leveraging Synergistic Deep and Traditional Machine Learning Techniques (remote) (382)*
Vinayaka Vivekananda Malgi; Sunil Aryal
- 16:15 *Optimizing 12-Lead Electrocardiogram Abnormality Detection with VGNet and ResNet (remote) (385)*
Ravindu Hiran Weerakoon; Sasika Pamith Amarasinghe; Isiri Amani Withanawasam
- 16:15 *Transformative Multimodal Fusion Techniques for ECG Image Analysis: PulsePlex's Approach for Classification and Waveforms Reconstruction (remote) (393)*
MD. Kamrujjaman Mobin
- 16:15 *Comparative Analysis of Digitization and Direct Classification Approaches for Arrhythmia Detection from Paper ECGs Using CNN Based Architectures (remote) (402)*
Jana F. Abedeljaber; Biswajit Padhi; Ping Zhang
- 16:15 *A hybrid method combining graph convolutional network and structured state space model for reconstructing and classifying paper ECGs (remote) (468)*
Xiang Wang
- 16:15 *Contrastive Waveform-Image Pretraining for Electrocardiogram Digitization and Classification (remote) (472)*
Adel M. Hassan; Muhammad Nuhan Ahnaf
- 16:15 *Multi-step Approach for the Extraction of RR Intervals from Scanned Paper ECGs (28)*
Marcus Vollmer; Marc Dörner; Stefanie Schreiber; Stefan Vielhaber; Lars Kaderali
- 16:15 *Fusion of Deep Learning and Rule-Based Techniques for Enhanced Paper-Based ECG Digitization (495)*
Amaan Kazi; Kelvin K. Nguyen; Varun Sendilraj; Shadi Manafi; Sasan Esfahani; Zaniar Ardalan; Saman Parvaneh
- 16:15 *Applying pre-trained deep learning models for Multi-Label Classification of Realistic and Noisy Electrocardiogram Images (remote) (496)*
Navchetan Awasthi; Swati Gupta
- 16:15 *Automated ECG Image Classification with InceptionV3 (remote) (498)*
David YN Njoroge; Victor Ruto; Antony Gitau; Lorna Mugambi; Victoria A. Sitati; Austin Kaburia
- 16:15 *Heart Disease Classification Using EfficientNet B5 with Three-Dimensional Scaled Electrocardiogram Images (remote) (499)*

David Wachira Warutumo; Paul K. Bett; Clinton Mwangi Kuya; Mary Wambui Kariuki

Special Session. Grasping Atrial Fibrillation: Untangling Mechanisms, Approaches, and Future Directions (S81)

Wed, Sep 11 08:30-10:00 in room Fritz-Haller-Hörsaal (FHH)

Chairs: Jichao Zhao, Axel Loewe

08:30 *Computational Insights into Atrial Fibrillation: Modeling Mechanisms and Guiding Treatment Strategies (133)*

Jichao Zhao

09:00 *Development of a User-Friendly Pipeline for Constructing Atrial Models at Scale: Importance of the End-User for Clinical Uptake (14)*

Laura Bevis; Semhar Biniyam Misghina; Elisa Rauseo; Carlos Edgar Lopez Barrera; Gernot Plank; Edward Vigmond; Axel Loewe; Elias Karabelas; Steffen E. Petersen; Gregory Slabaugh; Anthony Mathur; Caroline H. Roney

09:15 *Atrial fibrillation: how to move forward in this complex arrhythmia (108)*

Nele Vandersickel

09:30 *Atrial Fibrillation Goes Beyond Arrhythmias: You Will Have Stroke If You Do Not Treat It. Let's Model It! (490)*

Oscar Camara

Software Platforms (S82)

Wed, Sep 11 08:30-10:00 in room Egon-Eiermann-Hörsaal (EEH)

Chairs: Jari Hyttinen, Philip Warrick

08:30 *A Resource-Efficient Open-Source Solver for Monodomain Equations in Cardiac Electrophysiology (319)*

Alessandro Gatti; James D. Trotter; Tor Skeie; Hermenegild Arevalo; Xing Cai

08:45 *Facilitating Reproducible in silico Experiments with openCARP: a Step Toward FAIR and Open Science in Cardiac Electrophysiology (232)*

Marie Houillon; Jorge Sánchez; Matthias Gsell; Aurel Neic; Anton J. Prassl; Gunnar Seemann; Gernot Plank; Edward Vigmond; Axel Loewe

09:00 *Constructing Ventricular Digital Twins From Multi-Modal Clinical Data at Large Scale (311)*

María Correas García; Ines Llorente; Ernesto Zacur; Jana Reventós Presmanes; Andreu M. Climent; Maria de la Salud Guillem Sánchez; Jorge Sánchez

09:15 *Assessing ion channel blockade and electromechanical biomarkers' interrelations through a novel Multi-Channel Causal Variational Autoencoder (408)*

Safaa Al-Ali; Maria T Mora; Maxime Sermesant; Beatriz Trenor; Irene Balelli

09:30 *CosmoNote/PhysioNet: Simple Web Viewing, Annotating, and Time Map Navigating for PhysioBank Databases (455)*

Lawrence Fyfe; Elaine Chew

09:45 *The MUSIC Database: Sudden Cardiac Death in Heart Failure Patients (355)*

Alba Martin; Antonio Bayés-de-Luna; Rafael Vazquez; Pablo Laguna; Juan Pablo Martínez

Cardiovascular Mechanics I (S83)

Wed, Sep 11 08:30-10:00 in room Neuer Hörsaal (NH)

Chairs: Laura Buratinni, Óscar Cámara

08:30 *Analyzing the Fiber Effects of Combining Different Laplace-Dirichlet Rule-Based Methods for Simulating Heart Electromechanics (237)*

Roberto Piersanti; Luca Dede'; Natalia Trayanova; Alfio Quarteroni

08:45 *Cardiac Sensitivities to Biomechanical Changes in a Chronic Alcoholic Heart: A Case Study Using 3-Dimensional Electro-Mechanical Heart Modelling (456)*

Shahrokh Rahmani; Jim Pouliopoulos; Angela Lee; Rosie Kate Barrows; Marina Stocchi; Cristobal Rodero; Abdul Qayyum; Caroline H. Roney; Christoph Augustin; Gernot Plank; Andrew Jabbour; Diane Fatkin; Steven Niederer

09:00 *Torsional adaptations in the left ventricle post-myocardial infarction (480)*

Tanmay Mukherjee; Emilio A. Mendiola; Reza Avazmohammadi

09:15 *Model-based analysis of myocardial strains in obstructive and non-obstructive hypertrophic cardiomyopathy (240)*

Francesca Menna; Joan Duprez; Marion Taconne; Adrien al Wazzan; Eleonore Serrano; Lotfi Senhadji; Erwan Donal; Jari A. Hyttinen; Alfredo Hernandez; Virginie le Rolle

09:30 *Sensitivity Analysis of an Elastance-based Cardiovascular Model for CRT Optimization (489)*

Guilhem Fauré; Romano Setzu; Serge Cazeau; Alfredo Hernandez

09:45 *Chief Complaints and Survival of Heart Failure Patients at Critical Care Units (77)*

Filip Plesinger; Eniko Vargova; Zuzana Koscova; Radovan Smisek; Jan Pavlus; Veronika Bulkova; Pavel Jurak

Methods in ECGI (S84)

Wed, Sep 11 08:30-10:00 in room Jordan-Hörsaal (Jordan)

Chairs: Yesim Seringaoglu, Matthijs Cluitmans

08:30 *Towards Reduced Order Modelling of Cardiac Electroanatomical Mapping (32)*

- Olivier Crabbe; Karim El Houari; Louis Rigal; Sophie Collin; Pierre L'Eplattenier; Christelle Grivot; Michel Rochette; Antoine Simon; Pascal Haigron; Raphael Martins
- 08:45 *Finite Element-Based Space-Time Total Variation Regularization of the Inverse Problem in ECGI (290)*
Manuel Haas; Thomas Grandits; Thomas Pinetz; Simone Pezzuto; Alexander Effland
- 09:00 *Improved Performance of Data-Adaptive Regression Framework Based on Multivariate Adaptive Regression Splines for Electrocardiographic Imaging (294)*
Amael Mombereau; Yesim Serinagaoglu Dogrusoz; Remi Dubois; Laura R. Bear
- 09:15 *ECGI Without Geometry: a Deep Learning Based Estimation of Heart Surface Potentials (215)*
Tiantian Wang; Joel Karel; Pietro Bonizzi; Niels Osnabrugge; Kurt Driessens; Job Stoks; Matthijs Cluitmans; Paul Volders; Ralf L.M. Peeters
- 09:30 *In-silico Framework for Estimation of Atrial Septal Ectopic Beats: A Combination of Mathematical Models, Electrocardiographic Imaging, and Support Vector Machines (323)*
Rubén Molero Alabau; Raúl Moreno-Lopez; Andrea Cano Cabañero; Clara Herrero Martín; Carlos Fambuena Santos; Andreu M. Climent; Maria de la Salud Guillem Sánchez
- 09:45 *Revolutionizing Cardiac Diagnostics: Innovative Real-Time Fully Automated Non-Invasive Electroanatomical Mapping System (469)*
Mikhail Chmelevsky; Aleksandr Sinitca; Chiara Arduino; Svyatoslav Khamzin; Arsenii Dokuchaev; Anastasia Bazhutina; Stepan Zubarev; Margarita Budanova; Werner Rainer

ECG and Structural Heart Diseases (S91)

Wed, Sep 11 10:30-12:00 in room Fritz-Haller-Hörsaal (FHH)

Chairs: Pyotr Platonov, Jana Svehlikova

- 10:30 *Semi Automated Pipeline to Create Anatomical Twins and Perform Electrophysiology Simulations for Hypertrophic Cardiomyopathy (394)*
Shambhavi Mallik; Ludovica Cicci; Abdul Qayyum; Rahul Ghelani; Ji-Jian Chow; Alistair Young; Gernot Plank; Prapa Kanagaratnam; Steven Niederer
- 10:45 *Improving ECG diagnosis of left ventricular hypertrophy with contrastive ECG-echocardiogram learning (427)*
Mously Dior Diaw; Stéphane Papelier; Alexandre Durand-Salmon; Julien Oster
- 11:00 *ECG Deep Learning Dissects Physiology of Hypertrophic Cardiomyopathy (126)*

Sunil Manohar; Betty Raman; Alfonso Bueno-Orovio; Marcel Beetz; Yuling Sang; Zuzanna Borawska; Blanca Rodriguez; Raymond Y. Kwong; Milind Desai; William S. Weintraub; Christopher M. Kramer; Stefan Neubauer; Hugh Watkins; Vicente Grau; Sanjay Manohar; Rina Ariga

11:15 *In Silico Pace Mapping Outperforms ECGi in Identifying Focal Origins (325)*

Fernando Campos; Mark K. Elliot; Nadeev Wijesuriya; Marina Strocchi; John Whitaker; Sofia Monaci; Gernot Plank; Christopher Aldo Rinaldi; Martin Bishop

11:30 *ECG-Based Unsupervised Model Predicts Heart Failure and Major Adverse Cardiovascular Events in the General Population (422)*

Josseline Nicole Madrid; Stefan van Duijvenboden; Patricia Munroe; Ana Mincholé; Julia Ramírez

11:45 *Scar Imaging Minimally Affects Ablation Target Identification with In-silico Pace-mapping (377)*

Fernando Campos; Pranav Bhagirath; Zhong Chen; Sofia Monaci; John Whitaker; Gernot Plank; Christopher Aldo Rinaldi; Martin Bishop

Medical Technology (S92)

Wed, Sep 11 10:30-12:00 in room Egon-Eiermann-Hörsaal (EEH)

Chairs: Luca Mainardi, Guy Carrault

10:30 *Comparison of Simultaneous Recordings from Medical-Grade and Smartwatch ECGs (419)*

Haashim Mohammad Amir; Bhavini J. Bhatt; Alun Hughes; Siana Jones; Michele Orini

10:45 *Comparison between a Medical-Grade Device and a Cuffless Consumer-Grade Device for Day and Night Blood Pressure Monitoring (432)*

Bhavini J. Bhatt; Haashim Mohammad Amir; Siana Jones; Alun Hughes; Michele Orini

11:00 *Monitoring the Association Between Movements and Heart Rate Changes During Sleep: Feasibility of a Multi-sensor Wearable System Setup (431)*

Marcello Sicbaldi; Paola di Florio; Abdul Haleem Butt; Luca Palmerini; Lorenzo Chiari; Alessandro Silvani

11:15 *Determining Human Activity through ECG Motion Artifacts (152)*

Abdelrahman Abdou; Wagner Hoffmann; Andrew Lowe; Sri Krishnan

11:30 *Changes in Signal Morphology of Hand-held ECG Devices with Dry Electrodes (434)*

Markus Johannes Lüken; Matthias Zink; Steffen K. Leonhardt

11:45 *Investigation of the Influence of the Moisture Content of Clothes on Capacitive Electrocardiography (252)*

Onno Linschmann; Steffen K. Leonhardt; Markus Johannes Lüken

Cardiovascular Mechanics II (S93)

Wed, Sep 11 10:30-12:00 in room Neuer Hörsaal (NH)

Chairs: Filip Plesinger, Pablo Lamata

10:30 *Combined estimation of cross-sectional area, flow rate and Pulse Wave Velocity using Physics-Informed Neural Networks with 1D hemodynamic model data (378)*

Javier Orera; Pilar Garcia-Navarro; Julia Ramírez; Javier Murillo

10:45 *Identifiability As a Crucial Step For Using 0D Models To Derive Deeper Physiological Insights: An Application To Neonatal Cardiovascular Modelling (149)*

Robyn Walker May; Gonzalo D. Maso Talou; Finbar John Argus

11:00 *Preliminary Implementation of Novel Bifurcation Pressure Loss Model in a Reduced-Order Cardiovascular Flow Model (191)*

Natalia Leonie Rubio; Luca Pegolotti; Martin R. Pfaller; Eric Darve; Alison L. Marsden

11:15 *Predicting High-Risk Patients: A Biomechanical-Based Machine Learning Approach for Coronary Vulnerable Plaques Detection (314)*

Anna Corti; Marco Stefanati; Matteo Leccardi; Ovidio De Filippo; Alessandro Depaoli; Pietro Cerveri; Francesco Migliavacca; Valentina Corino; Jose F Rodriguez Matas; Luca Mainardi; Gabriele Dubini

11:20 *Towards the Creation of a Bioprinted Aortic Valve Prosthesis (25)*

Aadi N. Bhensdadia

11:45 *A CMR-based Study of 3D Torsional Behavior of Left Ventricle Post Mitral Valve Repair Surgery (475)*

Vahid Naeini; Seyed Babak Peighambari; Tanmay Mukherjee; Emilio A. Mendiola; Reza Avazmohammadi

Clinical Applications of ECGI (S94)

Wed, Sep 11 10:30-12:00 in room Jordan-Hörsaal (Jordan)

Chairs: María Guillem, Peter van Dam

10:30 *T-Wave Alternans Estimation with Manifold Learning (204)*

Estela Sánchez-Carballo; Francisco-Manuel Melgarejo-Meseguer; Arcadi Garcia; Juan José Sánchez Muñoz; Ramya Vijayakumar; Yoram Rudy; Jose Luis Rojo-Alvarez

10:45 *Assessment of 12-lead ECG-based Noninvasive Electroanatomical Mapping Accuracy: Incorporating Fibrosis Data in Advanced Computational Algorithms (342)*

- Anastasia Bazhutina; Svyatoslav Khamzin; Aleksandr Sinitca; Mikhail Chmelevsky; Margarita Budanova; Olga Aparina; Elena M. Rimskaya; Olga Stukalova; Sergey Ternovoy; Sergey Golitsyn
- 11:00 *Automatic real-time cardiac mapping system for the evaluation of cardiac resynchronization therapy (334)*
Rubén Molero Alabau; Marta Martínez Pérez; Mariona Regany Closa; Margarida Pujol Lopez; Berta Pellicer Sendra; Roger Borràs; Freddy Rainier Graterol; Jaume Serrano Campaner; Jana Reventós Presmanes; Till Althoff; Ivo Roca Luque; Eduard Guasch; Jose Maria Tolosana; Lluís Mont; Andreu M. Climent; Maria de la Salud Guillem Sánchez
- 11:15 *Comparing Inverse Reconstructed Endocardial and Epicardial Activation and Recovery with Invasive Electroanatomic Mapping (257)*
Manon M. Kloosterman; Machteld Boonstra; Iris van der Schaaf; Anneline te Riele; Peter Loh; Peter M. van Dam
- 11:30 *Impact of CRT Device Settings on Interventricular Dyssynchrony: An Analysis Using Non-Invasive Activation Map Reconstruction (353)*
Svyatoslav Khamzin; Stepan Zubarev; Anastasia Bazhutina; Margarita Budanova; Aleksandr Sinitca; Mikhail Chmelevsky
- 11:45 *Bayesian Estimation for Cardiac Activity Reconstruction using Clinical Data (298)*
Beata Ondrusova; Jana Svehlikova; Yesim Serinagaoglu Dogrusoz

Cardiovascular Imaging (PA1)

Wed, Sep 11 12:00-14:00 in room Math Foyer (Math)

Poster session¹

- 12:00 *Investigation of Left Ventricle Shape Dynamics in Preterm Infants Studied by Geometric Morphometrics (266)*
Tatiana Chumarnaya; Roman Rokeakh; Evgeniya Gusarova; Lev Malishevskii; Olga Solovyova
- 12:00 *Interpretable Echo Analysis Using Self-Supervised Parcels (302)*
Sylwia Majchrowska; Anders G.F. Hildeman; Ricardo Mokhtari; Philip A. Teare
- 12:00 *DIVAID: Automatic Division of Bi-Atrial Geometries Into Clinically Important Regions (316)*
Christian Goetz; Patricia Martinez Diaz; Till Althoff; Constanze Prof. Schmidt; Axel Loewe
- 12:00 *Exploring the Correlation Between Radiomics Features and Coronary Artery Calcification (321)*
Lida Alinezhad; Stefano Severi; Cristiana Corsi; Francesco Maffessanti

¹Those marked as *Remote* did not indicate in person presentation by the date of printing but may still be presented onsite.

- 12:00 *A Pipeline for Processing Ultrasound Image and Doppler Videos: Application to Dynamic Arterial Flowmetry and Diameter Measurement (333)*
Olivier Meste; Colin Lavigne; Fatimah Syam; Gregory M. Blain
- 12:00 *A Radiomics-Based Machine Learning Approach for Coronary Stenosis Assessment from Coronary Computed Tomography Angiography (335)*
 Francesca Ronchetti; Anna Corti; Francesca Lo Iacono; Mattia Chiesa; Gianluca Pontone; Gualtiero Colombo; Valentina Corino
- 12:00 *Enhanced Quality Assessment of Echocardiographic Images for Pulmonary Hypertension Using Convolutional Neural Networks (430)*
 Parnian Sattar; constance Verdonk; Frida Hermansson; Xiu Tang; Alison L. Marsden; Francois Haddad; Seraina Anne Dual
- 12:00 *Modelling Multi-phase Cardiac Anatomy with Generative Deep Learning (461)*
Thalia Seale; Blanca Rodriguez; Vicente Grau; Abhirup Banerjee
- 12:00 *Computed Tomography-Derived Myocardial Left-Ventricular Wall Thickness and Extracellular Volume Fraction Quantification and Correlation (426)*
Iulia Nazarov; Luca Azzolin; Aurel Neic; Ursula Rohrer; Ronak Rajani; John Whitaker; Martin Bishop

Cardiovascular Mechanics (PA2)

Wed, Sep 11 12:00-14:00 in room Math Foyer (Math)

Poster session¹

- 12:00 *Geometric Morphometrics Features of Left Ventricle Can Classify Responders and Non-responders to Cardiac Resynchronization Therapy (258)*
 Roman Rokeakh; Tatiana Chumarnaya; Stepan Zubarev; Lev Malishevskii; Olga Solovyova
- 12:00 *Enriched and Discontinuous Galerkin Discretizations for a Cardiac Mechanics Benchmark Problem (299)*
Laura Stengel; Jonathan Krauss; Axel Loewe; Christian Wieners
- 12:00 *In-silico Model to Study the Role of Anomalous Origin of Coronary Artery in Sudden Cardiac Death (remote) (331)*
 Seyyed Mahmoud Mousavi; Gianluca Zitti; Meri Gjika; Maurizio Brocchini
- 12:00 *Investigating the Mechanistic Effects of Medication on Pulmonary Hypertension (450)*

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Malak Ismail Sabry; Pablo Lamata; Ahmed Hassan; Onaiho O. Ojo; Magdi H. Yacoub; Adelaide De Vecchi

- 12:00 *Pulmonary Artery Pressure Differential Estimation using Machine Learning and Computational Fluid Dynamics Modeling Integration (479)*

Seyed Babak Peighambari; Tanmay Mukherjee; Rana Raza Mehdi; Emilio A. Mendiola; Reza Avazmohammadi

Ventricular Arrhythmias (PA3a)

Wed, Sep 11 12:00-14:00 in room Math Foyer (Math)

Poster session¹

- 12:00 *Shock Advisory Neural Network for Continuous Detection of Ventricular Fibrillation, Organized Rhythm and Asystole during Cardiopulmonary Resuscitation (282)*

Irena Ilijeva Jekova; Sarah Ménétré; Todor Stoyanov; Jean-Philippe Didon; Vessela Krasteva

- 12:00 *Longitudinal Analysis of EGM Dynamics near Ablation Points in Idiopathic Ventricular Arrhythmia (310)*

Janire Etxegia Apezetxea; Álvaro José Bocanegra; Giulio Falasconi; Diego Penela; Oscar Camara

- 12:00 *Slope Entropy as a Complexity Metric for the Characterization of Electrograms in Post-Ischemic Ventricular Tachycardia (421)*

Nicla Mandas; Marco Orrù; Giulia Baldazzi; Graziana Viola; Danilo Pani

- 12:00 *Simultaneous Endo-Epi Recording with Multi-Electrode Arrays and Optical Mapping of Atrial/Ventricular Tissue: A Feasibility Study in Pig Hearts (439)*

Jimena Gabriela Siles Paredes; Casey Lee-Trimble; Evan H. Rheaume; Mikael Toye; Henry Chionuma; Shahriar Iravanian; Ilija Uzelac; Joao Salinet; Flavio Fenton

- 12:00 *Attention-Enhanced Convolutional Neural Network for Inter-patient Classification of Premature Ventricular Contraction from ECG (remote) (463)*

Meng Chen; Yongjian Li; Wenzhuo Shi; Shoushui Wei

Atrial Mapping (PA3b)

Wed, Sep 11 12:00-14:00 in room Math Foyer (Math)

Poster session²

¹Those marked as *Remote* did not indicate in person presentation by the date of printing but may still be presented onsite.

²Those marked as *Remote* did not indicate in person presentation by the date of printing but may still be presented onsite.

- 12:00 *Magnetocardiography Imaging Based on Epicardial Sources for Mapping the Drivers of Atrial Fibrillation (3)*
Yadan Zhang; Xiang Min; Cui Yangyang; Peilun Li
- 12:00 *Catheter Configuration for Mapping Micro-Anatomic Reentries sustaining Atrial Fibrillation (remote) (102)*
María Termenón Rivas; Giada Sira Romitti; Miguel Rodrigo
- 12:00 *Temporal Analysis of Intracardiac Electrograms during Pulsed-Field Ablation (remote) (190)*
Vincent Schlageter; Badertscher Badertscher; Philipp Krisai; David Spreen; Stefan Osswald; Michael Kühne; Christian Sticherling; Sven Knecht
- 12:00 *In Silico Local Impedance Mapping Using Multielectrode Catheters (192)*
Carmen Martinez Anton; Laura Anna Unger; Axel Loewe; Olaf Doessel
- 12:00 *Source Ablation of Atrial Fibrillation Outperforms Conventional Ablation Strategies in Preventing Re-Initiation In-Silico (253)*
Victor Goncalves Marques; Ali Gharaviri; Simone Pezzuto; Pietro Bonizzi; Stef Zeemering; Ulrich Schotten
- 12:00 *Centrality Measures from Directed Network Mapping Identify Reentries Suggesting Different Mechanisms of Atrial Flutter (306)*
Davide Coluzzi; Massimo W Rivolta; Matteo Mancini; Laura Anna Unger; Armin Luik; Axel Loewe; Roberto Sassi
- 12:00 *Three-Dimensional Representation of Atrial Anatomy and Electrophysiology Enhanced by Mixed Reality (403)*
Klaudia Proniewska; Peter M. van Dam; Danila Potyagaylo

ML and Signal Processing Applications (PA4a)

Wed, Sep 11 12:00-14:00 in room Math Foyer (Math)

Poster session¹

- 12:00 *Universal ECG Noise Filter (478)*
Gabriel Soares Ferreira; João Paulo do Vale Madeiro
- 12:00 *Comparison of Noise Indexes for an Ambulatory Electrocardiogram Database with Ventricular Arrhythmias (287)*
Lorenzo Bachi; Maurizio Varanini; Magda Costi; David Lombardi; Lucia Billeci
- 12:00 *Automated RR Interval Detection and Quality Assessment in Telehealth Electrocardiograms (84)*
Sharon Yuen Shan Ho; Florian Kristof; Jonathan Mant; Peter H. Charlton
- 12:00 *Automatic Right Ventricular Hypertrophic Detection integrating Electrocardiography-based QRS Biomarkers with Machine Learning (85)*

¹Those marked as *Remote* did not indicate in person presentation by the date of printing but may still be presented onsite.

- Marion Taconne; Valentina Corino; Luca Mainardi
12:00 *Hearables: Deep Matched Filter for Online R-Peak Detection from In-Ear ECG in Mobile Application (89)*
Marek Zylinski; Harry J. Davies; Qiyu Rao; Danilo Mandic
- 12:00 *Neural Network-based automated ECG Delineation (124)*
Idriss Ngomseu Tchoupe; Mously Dior Diaw; Stéphane Papelier; Alexandre Durand-Salmon; Julien Oster
- 12:00 *Real-time Heartbeat Classification Based on Parallel QRS Detections (156)*
Wojciech Reklewski; Jeremiasz Potoczny; Marek Miśkowicz; Piotr Augustyniak
- 12:00 *ECG Feature Learning by Using Rational Variable Projection Autoencoders (165)*
Mátyás Márton Szabari; Gergo Bogнар; Peter Kovacs
- 12:00 *When does an ECG become abnormal? Determine the optimal transition between normal and abnormal ECG waveforms (175)*
Krzysztof Piotr Malinowski; Klaudia Proniewska; Peter M. van Dam
- 12:00 *Interpretable XGBoost-SHAP Model for Arrhythmic Heartbeat Classification (remote) (186)*
Rong Xiao; Meicheng Yang; Caiyun Ma; Lina Zhao; Jianqing Li; Chengyu Liu
- 12:00 *Analyzing Fetal Heart Rate Patterns via Latent Representations with Variational Recurrent Neural Networks (VRNNs) (219)*
Mahdi Shamsi; Aditi Lahiri; Yvonne W. Wu; Lawrence David Gerstley; Michael William Kuzniewicz; Marie-Coralie Cornet; Emily Hamilton; Philip Warrick; Robert E. Kearney
- 12:00 *Electrocardiographic signal broadband properties (228)*
Pavel Jurak; Ivo Viscor; Josef Halamek; Filip Plesinger; Radovan Smisek; Vlastimil Vondra; Magdalena Matejkova; Uyen Chau Nguyen; F. W. Prinzen; Karol Curila; Pavel Leinveber; Ladislav Soukup
- 12:00 *Assessment of ECG Signal Quality Index Algorithms using Synthetic ECG Data (270)*
Aron Syversen; Zhiqiang Zhang; Jonathan Batty; Matti Kaisti; David Jayne; David C. Wong
- 12:00 *Quantifying ECG Redundancy through Mutual Information Analysis among Leads and its Application in CNNs (324)*
Elisa Ramirez; Samuel Ruiperez-Campillo; Raúl Alós; Francisco Castells; Ruben Casado; Jose Millet
- 12:00 *ADAA: A Morphology-Aware Method for Local Activation Time Computation using Cross Correlation (339)*
Lucas Zoroddu; Pierre Humbert; Laurent Oudre; Thomas Demarcy; Laurent Launay; Francis Bessiere

- 12:00 *Estimation of EMG noise spectrum and its elimination from ECG signals (359)*
Vladimir Atanasoski; Marija Ivanovic; Lana Popovic Maneski; Marjan Miletic; Milos Babic; Aleksandra Nikolic; Jovana Petrovic
- 12:00 *Transforming ECG into a Poincaré Plot-Based Image for Its Quality Assessment Through a Pre-trained Convolutional Neural Network (374)*
Alvaro Huerta Herraiz; Oscar Ayo-Martin; Jose J Rieta; Raul Alcaraz
- 12:00 *Adaptive ECG Sampling – A Minimum-Error Approach (391)*
Debelo Oljira Hinaw; Piotr Augustyniak
- 12:00 *On the Estimation Performance of Patient-Specific Linear ECG-Lead Transformations in the Presence of Cardiac Conduction Changes (424)*
Daniel Guldenring; Alan Kennedy; Peter Doggart; Raymond Bond; Dewar Finlay
- 12:00 *AI model for automatic detection of P, T waves and QRS complex in ECG signals implemented using Brazilian data from the largest public health system in the world (467)*
Matheus Felipe Akira de Assis Oliveira; Derick Oliveira; Jermana Moraes; Wagner Meira JR; Antonio Luiz Ribeiro
- 12:00 *Does a Reduced ECG Lead Set Contain the Full 12-lead ECG information for Interpretation (remote) (473)*
Joel Xue
- 12:00 *Accurate Identification of Actionable Single-Lead ECG Data Using a Signal Quality Assessment Algorithm (remote) (24)*
Jordan Diven; Rebecca Hand; Jonathan Francey; Holly Easlea; Andrew Miller; David Burke
- 12:00 *Deep Learning End-to-End Approach for Precise QRS Complex Delineation Using Temporal Region-Based Convolutional Neural Networks (107)*
Richard Redina; Jakub Hejc; Fabian Theurl; Tomas Novotny; Irena Andrsova; Katerina Hnatkova; Zdenek Starek; Marina Filipenska; Marek Malik; Axel Bauer
- 12:00 *Inferring Laboratory Values from Electrocardiogram Signals - An Exploratory Study (remote) (112)*
Juan Miguel Lopez Alcaraz; Nils Strothoff
- 12:00 *The Potential of Wave Masking in 12-Lead Electrocardiogram Reconstruction (188)*
Ekenedirichukwu Nelson Obianom; G. Andre Ng; Xin Li
- 12:00 *Active Learning Approach for Clinical Noise Characterization in Long-Term ECG Monitoring (244)*

- Roberto Holgado Cuadrado; Francisco-Manuel Melgarejo-Meseguer; Jose Luis Rojo-Alvarez; Manuel Blanco-Velasco
- 12:00 *Denoising Autoencoders for the detection of patients out of distribution of healthy individuals (268)*
Mariette Dupuy; Remi Dubois; Marie Chavent
- 12:00 *Deep Transfer Learning for Detection of Atrial Fibrillation using Holter ECG Color Maps (283)*
Todor Stoyanov; Vessela Krasteva; Stefan Naydenov Naydenov; Ramun Schmid; Irena Ilieva Jekova
- 12:00 *In Search of an Optimal FIR filter for ECG Delineation (301)*
Vessela Krasteva; Irena Ilieva Jekova; Todor Stoyanov; Ramun Schmid
- 12:00 *Assessing ECG Signal Quality Using a Pre-trained Audio Network (449)*
Alvaro Huerta Herraiz; Oscar Ayo-Martin; Jose J Rieta; Raul Alcaraz
- 12:00 *Development of Explainable AI Techniques for Differential Diagnosis of Wide Complex Tachycardias Using Automated Analysis of 12-lead ECG (remote) (460)*
Mikhail Chmelevsky; Konstantin Egorov
- 12:00 *Spectral-Statistical Analysis for Fetal R-Peak and Heart Rate Variability Calculation from Abdominal ECG (remote) (482)*
Yousif Shwetar; Jack Twiddy; Michael Daniele

BSPM and ECGi (PA4b)

Wed, Sep 11 12:00-14:00 in room Math Foyer (Math)

Poster session¹

- 12:00 *An Experimental Rabbit Torso-tank Setup for Cardiac Rhythms Investigation Using ECGi (217)*
Angélica Drielly Quadros; Tainan Cerqueira Neves; Vinicius de Paula Silva; Italo Sandoval Ramos de Oliveira; Jimena Gabriela Siles Paredes; Shiva Eghdamian; Ilija Uzelac; Jose Carlos PACHON-M; Joao Salinet
- 12:00 *Deep Transfer Learning for Visually Induced Motion Sickness Detection Using Symmetric Projection Attractor Reconstruction of the Electrocardiogram (212)*
Emmanuel Molefi; Ramaswamy Palaniappan
- 12:00 *On the Feasibility of Locating Myocardial Bridge through the 12-Lead Electrocardiogram: a Case Study (278)*
Mhd Jafar Mortada; Agnese Sbrollini; Peter M. van Dam; Laura Burattini
- 12:00 *PhysECG: Heart Activity Reconstruction Algorithm Based on Physical Principles (423)*

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Sebastian Wildowicz; Tomasz Gradowski; Paulina Figura; Judyta Sobiech; Igor Olczak; Teodor Buchner

- 12:00 *Development and Implementation of a First-in-Class Web-based Cloud Platform for Non-Invasive Electroanatomical Mapping (remote) (466)*
Mikhail Chmelevsky; Aleksandr Sinitca; Chiara Arduino; Svyatoslav Khamzin; Arsenii Dokuchaev; Anastasia Bazhutina; Stepan Zubarev; Margarita Budanova; Werner Rainer

Modeling Arrhythmias and Drugs (PA5)

Wed, Sep 11 12:00-14:00 in room Math Foyer (Math)

Poster session¹

- 12:00 *T Wave Pseudonormalisation as a Stress ECG Manifestation of Myocardial Ischaemia in Hypertrophic Cardiomyopathy (65)*
James Coleman; Ruben Doste; Matteo Beltrami; Raffaele Coppini; Iacopo Olivotto; Betty Raman; Alfonso Bueno-Orovio
- 12:00 *The Autonomic Nervous System can Compensate for Hypocalcemia-Induced Bradycardia in Human and Rabbit Sinoatrial Node Cell Models (76)*
Moritz Linder; Tomas Stry; Axel Loewe
- 12:00 *Analysis and Generation of Fibrosis in Patient with Non-Ischemic Cardiomyopathy (111)*
Arstanbek Okenov; Timur Nezhlobinskii; Nele Vandersickel
- 12:00 *Inferring ion channel block from rabbit Purkinje fiber action potential recordings for cardiac pharmaceutical assessment (129)*
Luca Del Core; Gary Mirams
- 12:00 *In Silico Optogenetic Control of Spiral Waves in GtACR1-transduced Atrial Diffuse and Focal Fibrotic Tissues (remote) (169)*
Heqing Zhan; Kaiqi Liu; Guowei Sun
- 12:00 *Analysis of the Use of the BPS Model to Simulate Ischemia-induced Hyperkalemia (254)*
Delyar Asadbaji; Chiara Bartolucci; Stefano Severi; Jose M Ferrero
- 12:00 *Piezo1-Nitric Oxide Signaling in a Population-based Model of Arterial Myocytes in Acute Hyperglycemia (296)*
 Amin Forouzandehmehr; Nicole Anderton; Jari A. Hyttinen; Jussi T. Koivumäki
- 12:00 *Estimation of the PVC Origin from Simulations Using Cellular Automaton (303)*
Jana Svehlikova; Jan Zelinka; Milan Tysler
- 12:00 *A Novel Computational Model of the Zebrafish Atrial Action Potential and Intracellular Calcium Transient (330)*

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- Zachary D. Long; Ludovica Cestariolo; Jose M Ferrero; Alex Quinn; Jose F Rodriguez Matas
- 12:00 *Uncertainty Quantification in a Cardiac Arrhythmia Model: Application to Intra-Atrial Reentrant Tachycardia (348)*
Maarten Volkaerts; Marie Cloet; Tanger Niklas; Hans Dierckx; Piet Claus; Giovanni Samaey
- 12:00 *Dynamic Dofetilide-hERG Channel Model Considering Preferential State Binding and Trapping Properties (remote) (367)*
Fernando Escobar Ropero; Soren Friis; Nouran Adly; Julio Gomis-Tena Dolz; Javier Saiz; Sonja Stoelzle-Feix; Lucía Romero
- 12:00 *Enhancing 2D Patient Specific Electrophysiology with Physics-Informed Neural Networks (396)*
Adam Jakobsen; Vajira Thambawita; Thu Nguyen; Mary M. Maleckar; Gabriel Balaban
- 12:00 *Toxic and Proarrhythmic Effects of Airborne Particulate Matter Exposure. In-vitro, In-vivo and In-silico Study (remote) (442)*
Catalina Tobon; Laura Palacio; Angela M. Gómez; Juan P Ugarte; Isabel C. Ortiz; Natalia Acevedo; Sami Noujaim; Javier Saiz
- 12:00 *Multi-Modal Optical and Ultrasound Imaging of the Heart's Electromechanics: A High-Resolution Ex Vivo Platform (471)*
Jan Lebert; Shrey Chowdhary; Shai Dickman; Charles Gordon; Divya Krishnan; Farzan Shiju; Jan Christoph
- 12:00 *Geometrically-derived Action Potential Markers for Model Development: A Principled Approach? (488)*
Michael Clerx; Gary Mirams
- 12:00 *Application of Order and Sample Selection in Uncertainty Quantification of Cardiac Models (remote) (6)*
Anna Busatto; Lindsay Rupp; Karli Gillette; Gernot Plank; Akil Narayan; Rob MacLeod

Cardiac Vibration Signals (PA6a)

Wed, Sep 11 12:00-14:00 in room Math Foyer (Math)

Poster session¹

- 12:00 *Shoe Insole ballistocardiography as a Tool for Heart Rate Variability Estimation in Smart Insoles (416)*
Jose Alberto Garcia Limon; Ramon Casanella; Carlos Alvarado Serrano
- 12:00 *Porcine Model for Validation of Noninvasive Estimation of Pulmonary Hypertension (304)*

¹Those marked as *Remote* did not indicate in person presentation by the date of printing but may still be presented onsite.

Ali Agam; Aya Mohammed Alsadi; Gustav Oliver Kandel Damgaard; Bawi Chin Tial Siakhel; Ahmad Agam; Peter Søgaaard; Benedict Kjærgaard; Noemi Giordano; Emil Korsgaard; Johannes Struijk; Samuel Emil Schmidt

Photoplethysmography (PA6b)

Wed, Sep 11 12:00-14:00 in room Math Foyer (Math)

Poster session¹

12:00 *Estimating Continuous Blood Pressure from a Smartphone PPG Using 1D U-Net (64)*

Jan Sima; Andrea Nemcova; Radovan Smisek; Zuzana Novakova

12:00 *A Generative Methodology for PPG to ECG Reconstruction Based on Dual-Critic Approach (486)*

Rashmi Kumari; Prateek Agrawal; Spandan More; Nikhil Praveen; Surita Sarkar; Pabitra Das; Amit Acharyya

12:00 *Style Transfer-assisted Deep Learning Method for Photoplethysmogram Denoising (remote) (37)*

Sara Maria Pagotto; Federico Tognoni; Matteo Rossi; Dario Bovio; Caterina Salito; Luca Mainardi; Pietro Cerveri

12:00 *Simulation of Ventricular Tachycardia in Photoplethysmogram: Hardware Implementation (50)*

Andrius Solosenko; Saulius Daukantas; Daivaras Sokas; Vaidotas Marozas; Andrius Petrenas

12:00 *Protocol for Controlled Desaturation Tests for Non-Invasive Pulse Oximeter Performance Testing (336)*

Anna Parviainen; Jarkko Harju; Heikki Karinen; Antti Vehkaoja

12:00 *Does Skin Tone Affect Machine Learning Classification Accuracy Applied to Photoplethysmography Signals? (38)*

Philip Aston

12:00 *Comparative Study on the Generalization Ability of Machine Learning Algorithms for PPG Quality Assessment (279)*

Santiago Mula; Roberto Zangroniz; Oscar Ayo-Martin; Jose J Rieta; Raul Alcaraz

12:00 *Going Beyond Atrial Fibrillation in Arrhythmia Classification from Photoplethysmography Signals (110)*

Eniko Vargova; Andrea Nemcova; Radovan Smisek; Zuzana Novakova

12:00 *A Network Physiology Approach to Brain-Heart Interaction for Affective State Characterization Using Photoplethysmography Features (remote) (381)*

¹Those marked as *Remote* did not indicate in person presentation by the date of printing but may still be presented onsite.

- 12:00 Feryal A. Alskafi; Ahsan Khandoker; Faezeh Marzbanrad; Herbert F. Jelinek
In-ear pulse wave amplitude recordings during synchronized walking (363)
Aurora Rosato; Seraina Anne Dual
- 12:00 *Analysis of Photoplethysmographic Signals in Low-Dimensional Latent Spaces (338)*
Enrique Feito-Casares; Francisco-Manuel Melgarejo-Meseguer; Alejandro Cobo; Luis Baumela; Jose Luis Rojo-Alvarez
- 12:00 *VPE-Net: Simultaneous Measurement of Heart Rate, Respiration Rate, and Blood Pressure from PPG (389)*
Surita Sarkar; Pabitra Das; Prateek Agrawal; Rashmi Kumari; Saurabh Saurabh; Amit Acharyya
- 12:00 *Skin Reflection Angle Useful for Region of Interest Selection in Camera-based Heart Rate Estimation? (459)*
Maurice Rohr; Philipp Witulla; Christoph Hoog Antink
- 12:00 *Predicting Age From a Real World Smartphone Acquired PPG Signal Using Deep Learning (293)*
Myrte Barthels; Thomas De Cooman; Henri Gruwez; David Duncker; Pieter Vandervoort
- 12:00 *A machine learning approach to detect hypertension, diabetes and cardiovascular disease from PPG (415)*
George Searle; Stefan van Duijvenboden; Julia Ramírez; Andrew Tinker; Patricia Munroe; Pier Lambiase; Alun Hughes; Michele Orini

Health Informatics (PA6c)

Wed, Sep 11 12:00-14:00 in room Math Foyer (Math)

Poster session¹

- 12:00 *Effects and Impact of Fluid Creep in Intensive Care Unit Patients Receiving Intravenous Fluid Therapy After One Week (369)*
Giulia Carpani; Maximiliano Mollura; Stefano Finazzi; Francesca Baroncelli; Riccardo Barbieri
- 12:00 *Integrating Clinical Chart and Laboratory Data for Predicting Heart Failure Recurrence (139)*
Zuzana Koscova; Eniko Vargova; Jan Pavlus; Radovan Smisek; Filip Plesinger
- 12:00 *A Hybrid CNN-LSTM Model for Heart Failure Detection Using Raw ECG Signals (197)*
sona alyounis; Ahsan Khandoker; Cesare Stefanini; Leontios J. Hadjileontiadis
- 12:00 *A Computer Model for In-Silico Trials on Pacemaker Energy Efficiency (235)*

¹Those marked as *Remote* did not indicate in person presentation by the date of printing but may still be presented onsite.

- Yves Coudière; Michael Leguèbe; Irene Balelli; Alessia Baretta; Guilhem Fauré; Delphine Feuerstein
- 12:00 *A Feasibility Study on Feature Analysis for Classification of Heart Murmur Grades (remote) (193)*
- Foli Fan; Caiyun Ma; Feifei Chen; Chenxi Yang; Jianqing Li; Chengyu Liu
- 12:00 *Holiday Hemoglobin: How the Vacations Affect Blood Donations Across Diverse Urban Sites (75)*
- Filip Plesinger; Stanislava Koskova; Eniko Vargova; Martina Adamcova; Jan Pavlus; Gabriela Kopeckova; Radovan Smisek; Hana Lejdarova
- 12:00 *Sensor Fusion-based Deep Learning Models for Human Activity Classification (remote) (418)*
- Parshuram N. Aarotale; Ajita Rattani
- 12:00 *Machine Learning Identification of Patients with Non-ST Segment Elevation Acute Coronary Syndrome using High-resolution Magnetocardiography (72)*
- Bai Guiyu; Ziyuan Huang; Cui Yangyang; Maotong Pang
- 12:00 *Risk Assessment of Fetuses for Hypoxic-Ischemic Encephalopathy using Antepartum Clinical Data (127)*
- Ethan Grooby; Johann Vargas-Calixto; Aditi Lahiri; Yvonne W. Wu; Lawrence David Gerstley; Michael William Kuzniewicz; Marie-Coralie Cornet; Emily Hamilton; Philip Warrick; Robert E. Kearney

Medical Technology (PA6d)

Wed, Sep 11 12:00-14:00 in room Math Foyer (Math)

Poster session¹

- 12:00 *Comparison Between Smartwatch-Derived and CPET-Measured VO₂max (remote) (352)*
- Alexandra Jamieson; Siana Jones; Claire Steves; Nicholas Timpson; Nishi Chaturvedi; Alun Hughes; Michele Orini
- 12:00 *Comparative Analysis of 1-D and 2-D Deep Convolutional Neural Networks in Magnetocardiogram Classification for Coronary Artery Disease (13)*
- Jia Yifan; Cui Yangyang; Yadan Zhang; Xiang Min
- 12:00 *The Acceptability of Wearables for Atrial Fibrillation Screening: Interim Analysis of the SAFER Wearables Study (60)*
- Peter H. Charlton; Justinas Bacevicius; Timothy Bonnici; James Brimicombe; Cheryl Chapman; Andrew Dymond; Miranda Van Emmenis; Panicos A. Kyriacou; Vaidotas Marozas; Andrius Rapalis; Kate Williams; Jonathan Mant

¹Those marked as *Remote* did not indicate in person presentation by the date of printing but may still be presented onsite.

- 12:00 *Analysis of Heart Rate Variability Using Noncontact Capacitive Coupling Electrocardiography: An Accuracy Assessment (33)*
Zhijun Xiao; Maarten de Vos; Christos Chatzichristos; Yunyi Jiang; Chenxi Yang; Jianqing Li; Chengyu Liu
- 12:00 *Calibration of a Rescaled 0D Pacemaker-Bimembrane Model using Animal Experiments (remote) (317)*
Valentin Pannetier; Michael Leguèbe; Yves Coudière; Gwladys Ravon; Delphine Feuerstein; Guilhem Fauré; Richard Walton

Heart Rate Variability (PA7)

Wed, Sep 11 12:00-14:00 in room Math Foyer (Math)

Poster session¹

- 12:00 *Exploration of Heart Rate Variability for the Prediction of Performance in Youth Footballers (136)*
Kacper Korzeniewski; Jakub S. Gąsior; Magdalena Mikielawicz; Maciej Rosol; Robert Makuch; Marcel Młyńczak
- 12:00 *Analysis of COVID patients employing Approximate Entropy and Deep Learning for classification and early diagnosis (remote) (173)*
Diego Rodrigo DiegoRodrigoCornejo; Antonio Gabriel Ravelo-García; María Fernanda Rodríguez María Fernanda Rodríguez María Fernanda Rodríguez; Luz Alexandra Díaz; Victor Andres Cabrera-Caso; Dante Condori-Merma Dante Condori-Merma; Miguel Vizcardo; SantiagolsmaelFlores SantiagolsmaelFlores SantiagolsmaelFlores
- 12:00 *Heart Rate Variability Measures as Predictors of Major Depressive Disorder in Patients with Obstructive Sleep Apnea (remote) (185)*
Shaween Shukir; Ahsan Khandoker; Mostafa Mohamed Moussa
- 12:00 *Respiratory Sinus Arrhythmia: Bidirectional Phase Coupling between Respiration and Heart Rate in Depression with Suicidal Ideation (remote) (200)*
Mohanad Alkhodari; Ahsan Khandoker; Leontios J. Hadjileontiadis; Herbert F Jelinek
- 12:00 *Identification of Presyncope using 24-hour ECG Recordings and Heart Rate Variability Analysis (230)*
David J. Cornforth; Helmut Ahammer; Herbert F. Jelinek
- 12:00 *Sleep Apnea Detection - Towards Wearables (307)*
Martin Kralik; Andrea Nemcova; Jiri Kozumplik; Eniko Vargova
- 12:00 *Analysis of RR Interval Entropies for Discrimination between Wake and Sleep States (remote) (354)*

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SantiagolsmaelFlores SantiagolsmaelFlores SantiagolsmaelFlores; Antonio Gabriel Ravelo-García; Miguel Vizcardo

12:00 *Using Heart Rate Fragmentation and Heart Rate Asymmetry to Discriminate Congestive Heart (411)*

Sadaf Moharrerri; Shahab Rezaei; Saman Parvaneh

12:00 *Heart Rate Regulation in Long-Covid-19 Patients According to the Year of Infection (420)*

Stella Tassinari Maximo; Ana Leticia Gomes Dos Santos; Samuel Minucci Camargo; William Tsutomu Watanabe; Kelly Correa Baioco da Silva; Christian Goncalves Sasaki; Silvia Helena Bastos de Paula; Jose L. Puglisi; Daniel Gustavo Goroso

YIA Semifinalists (SB1)

Wed, Sep 11 14:00-15:00 in room Fritz-Haller-Hörsaal (FHH)

Chairs: Olivier Meste, Julien Oster

14:00 *Non-Invasive Electrogram Estimation from Body Surface Potential Mapping using Artificial Intelligence (476)*

Andrea Cano Cabañero; Raúl Moreno-Lopez; Clara Herrero Martín; Ernesto Zacur; Andreu M. Climent; Rubén Molero Alabau; Maria de la Salud Guillem Sánchez

14:15 *Morphology Features Self-Learned by Explainable Deep Learning for Atrial Fibrillation Detection Correspond to Fibrillatory Waves (305)*

Alexander Hammer; Hagen Malberg; Martin Schmidt

14:30 *Efficient Generation of Cardiac Digital Twins for Personalized Atrial Fibrillation Treatment Using Non-Invasive ECGI Data (346)*

Clara Herrero Martín; Raúl Moreno López; Maria Macarulla-Rodriguez; Jorge Sánchez; David Lundback; Ernesto Zacur; Maria de la Salud Guillem Sánchez; Andreu M. Climent; Caroline H. Roney; Ismael Hernández-Romero

14:45 *Sudden Cardiac Death Prediction in Chagas Heart Disease Patients from ECG-derived Biomarkers of Ventricular Restitution (440)*

Ángela Hernández Mendoza; João Paulo do Vale Madeiro; Roberto Coury Pedrosa; Pablo Laguna; Julia Ramírez

Heart Rate Variability Applications (SB2)

Wed, Sep 11 14:00-15:00 in room Egon-Eiermann-Hörsaal (EEH)

Chairs: Riccardo Barbieri, Carolina Varon

14:00 *Empirical Survey on Occult Atrial Fibrillation Prediction During Sinus Rhythm Through Heart Rate Variability Analysis and Premature Atrial Contractions (94)*

Daniele Padovano; Arturo Martinez-Rodrigo; Oscar Ayo-Martin; Jose J Rieta; Raul Alcaraz

- 14:15 *Combination of QT and RR Analysis in the Detection of Long QT Syndrome (103)*
Matias Kanninen; Teemu Pukkila; Esa Rasanen
- 14:30 *Cardiovascular Diseases Inhibit the Activation of Cardio-Cerebral Coupling During Arousals (74)*
Richard Hohmuth; Jakob Müller; Hagen Malberg; Martin Schmidt
- 14:45 *A Novel Protocol for the Quantification of Cardiovascular and Autonomic Responses to Urban Environments Through Physiological Signals (366)*
Chiara Maninetti; Rita Laureanti; Barbara E. A. Piga; Nicola Rainisio; Marco Boffi; Gabriele Stancato; Luca Mainardi; Riccardo Barbieri

Cardiovascular CT and Ultrasound (SB3)

Wed, Sep 11 14:00-15:00 in room Neuer Hörsaal (NH)

Chairs: Agnese Sbrollini, José Millet

- 14:00 *Applying a Digital Twin Framework for Stroke Risk Evaluation in Atrial Fibrillation Patients (341)*
Matteo Falanga; Camilla Cortesi; Antonio Chiaravalloti; Alessandro Dal Monte; Corrado Tomasi; Cristiana Corsi
- 14:15 *Analysis of Interindividual Variance in Coronary Sinus Veins Anatomy Based on Computer Tomography Data (256)*
Arsenii Dokuchaev; Chiara Arduino; Mikhail Chmelevsky; Stepan Zubarev; Margarita Budanova; Sergei Rud; Anastasia Bazhutina; Svyatoslav Khamzin; Aleksandr Sinitca
- 14:30 *Increasing the accuracy of 3D heart models based on micro-computed tomography (387)*
Julianna Marianna Dabrowa; Paweł Ozga; Małgorzata Wołek; Sebastian Wronski; Jacek Tarasiuk; Klaudia Proniewska
- 14:45 *Automatic Segmentation of the Inferior Vena Cava from M-mode Ultrasound Images (201)*
David Chaparro-Victoria; Amelia Campos; Silvia Crespo Aznarez; Laura Karla Esterellas; Vanesa Garces Horna; Marta Sanchez-Marteles; Juan Pablo Martínez; Violeta Monasterio; Jorge Rubio-Gracia; Alejandro Alcaine

ECG in Nontraditional Forms (SB4)

Wed, Sep 11 14:00-15:00 in room Jordan-Hörsaal (Jordan)

Chairs: Johan De Bie, José Luis Rojo

- 14:00 *A Two Stage Method for Multi-Level Signal Quality Assessment of Magnetocardiography Signals (41)*
Dong Xu; Ze Zhu; Xiang Min

- 14:15 *Impact of Electrode Contact Site on the 12-Lead ECG Synthesized from Wrist-Worn Device Signals (53)*
Karolina Janciuleviciute; Daivaras Sokas; Dziugile Kersnauskaite; Zygimantas Abramikas; Saulius Daukantas; Vytautas Juknevičius; Justinas Bacevicius; Leif Sornmo; Andrius Petrenas
- 14:30 *Integrating Audio and ECG Data for Heart Sound Detection: A Machine Learning Approach (483)*
Thu P. Mains; Shruti Kshirsagar
- 14:45 *Magnetocardiography-Based Coronary Artery Disease Detection Using Ensemble Learning Methods (313)*
Dong Xu; Xiaole Han; Xiang Min

Closing Plenary (CP)

Wed, Sep 11 15:00-17:00 in room Gerthsen-Hörsaal (Gerthsen)

Chairs: Rob MacLeod, Axel Loewe

- 15:00 *Harmonizing biomedical engineering and medical needs (493)*
Linda Johnson
- 15:30 *Identification of Potential Ablation Targets for Ventricular Tachycardia Using a Novel Omnipolar-based Propagation Organization Metric (261)*
Samuel Ruiperez-Campillo; Gema Cabero Vidal; Johanna Tonko; Jose Millet; Francisco Castells
- 15:45 *A Model Population-Based Approach to Enhance the Detection of Premature Ventricular Contraction of ECGI (284)*
Jorge Sánchez; Ines Llorente; Santiago Ros; Felipe Atienza; Andreu M. Climent; Maria de la Salud Guillem Sánchez
- 16:00 *Award Ceremony*

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We thank all our reviewers!

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CinC 2025: São Paulo, Brazil

A historic first conference in Latin America

It is with great enthusiasm and pleasure that we share with you the thrilling news that the 2025 Computing in Cardiology Conference will take place, for the first time in its 52-year history, in Latin America. More specifically, we will be welcoming you to São Paulo, Brazil, the largest city in South America, between September 14th and Sept 17th.

It will be a rich opportunity for attendees to visit and travel throughout Brazil, one of the most visited destinations in Latin America, a country with an immense variety of unique natural beauty and ranked in 2023 as the best country in the world for ecotourism by the Forbes magazine. There is a wide range of biomes in Brazil, including the Amazon tropical rain forest, Cerrado (savana), Pantanal (the world's largest tropical wetland), Atlantic rain forest, Caatinga (semi-arid biome) and Oceanic Islands, part of the list of Brazilian destinations recognized by UNESCO as Natural Heritage of Humanity. The main language spoken here is Portuguese, due to Portuguese colonization, which began in 1500, and different from all other countries in South America, which were colonized by the Spanish.

The city of São Paulo is the capital of the state of São Paulo and has the largest urban economy in Latin America. The state is recognized as an important scientific center, hosting some of the most renowned universities in Latin America. It is responsible for around 20% of all publications from Latin American.

São Paulo city has a highly active and diverse nightlife that is considered one of the best in the country, with bars, and nightclubs open until late night. It is also considered the most multicultural city in Brazil, and the home of important historic monuments, cultural centers, museums and parks, excellent restaurants and important international influence in commerce, finance, arts, and entertainment from 70 different nationalities. The city has a humid subtropical climate, and during the conference, which will take place at the end of our winter and the beginning of spring, temperatures tend to range between 18 and 27°C, with sunny skies during the day and a low probability of rain. São Paulo is based on a plateau at beyond the Serra do Mar (Coastal Mountain range), part of the Brazilian Highlands, elevated 800 meters above sea level, and located 70 kilometers to the Atlantic Ocean. It is simple to rent a car and reach the coast in approximately one hour. The state is in a picturesque region with 30% of its total area covered by the Atlantic rain forest. The state's coastline is bathed by the Atlantic Ocean and is more than 700 km long, 60% of

which is along a strip of sand, with around 200 beaches. Beaches are of rare beauty, some still sparsely inhabited, offer ideal conditions for water sports or bathing. Thousands of waterfalls cut through the forests of the coast, which have ecological reserves, and areas of native tropical forest.

The event will take place in the Rebouças Convention Center, 10 minutes walk from Paulista Avenue, a symbol of the city of São Paulo and known as the heart of São Paulo. This is the most important center for business, with a bike path, theaters, cinemas, museums, shopping centers, craft fairs and street artist performances. The area has many hotels with a wide spectrum of budgets. Participants flying in from abroad can arrive in São Paulo from three different airports, the largest being Guarulhos Airport, which has more than 650 international flights per week from all over the world. The scientific events of CinC 2025 will kick off with The Sunday Symposium, themed “The role of technology to characterize, monitor, and overcome heart abnormalities: A panoramic multiscale view”. The local organizing committee is composed of professors and students from the Federal University of ABC, University of São Paulo, Federal University of Ceará, University of Mogi das Cruzes and Federal University of Rio de Janeiro. We are very excited to welcome you here in Brazil, for the historic first Latin American CinC, with our country’s renowned friendliness and warmth.

With kind regards on behalf of the Local Organizing Committee, CinC 2025
João Salinet – Chairman,
João Lameu – Vice Chairman



Monday, September 9

08:30	Welcome to CinC 2024 (Wel), p. 23	Gerthsen
09:00	Rosanna Degani Young Investigator Finals (RDYIA), p. 23	Gerthsen
11:00	ECG Analysis Technology (S21), p. 23	FHH
11:00	Whole Heart Modeling (S22), p. 24	EEH
11:00	Special Session. Photoplethysmography Imaging (S23), p. 24	NH
11:00	Cardiovascular Magnetic Resonance (S24), p. 25	Jordan

Tuesday, September 10

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08:30	Cellular and Tissue Models (S32), p. 26	EEH
08:30	Heart Rate Variability (S33), p. 27	NH
08:30	Cardiac Vibration Signals (S34), p. 27	Jordan
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10:30	Modeling Atrial Arrhythmias (S42), p. 29	EEH
10:30	Cardiovascular Variability (S43), p. 29	NH
10:30	Ventricular Arrhythmias in Experiment and in silico Models (S44), p. 30	Jordan
12:15	Beyond Academia: Career Paths for PhDs and Early-Stage Researchers in Industry (SC), p. 30	MathSR
13:00	Photoplethysmography (S51), p. 31	FHH
13:00	ECG Analysis in Ischemia and Repolarization (S52), p. 31	EEH
13:00	Atrial Signal Analysis (S53), p. 32	NH
13:00	PhysioNet Challenge I (S54), p. 32	Jordan
14:45	ML and Clinical Applications (S61), p. 33	FHH
14:45	ML and Signal Processing Applications (S62), p. 33	EEH
14:45	Atrial Mapping (S63), p. 34	NH
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16:15	Poster Session 1 (PA), p. 35	Math

Wednesday, September 11

08:30	Special Session. Grasping Atrial Fibrillation (S81), p. 49	FHH
08:30	Software Platforms (S82), p. 49	EEH
08:30	Cardiovascular Mechanics I (S83), p. 50	NH
08:30	Methods in ECGI (S84), p. 50	Jordan
10:30	ECG and Structural Heart Diseases (S91), p. 51	FHH
10:30	Medical Technology (S92), p. 52	EEH
10:30	Cardiovascular Mechanics II (S93), p. 53	NH
10:30	Clinical Applications of ECGI (S94), p. 53	Jordan
12:30	Poster Session 2 (PB), p. 54	Math
14:00	YIA Semifinalists (SB1), p. 67	FHH
14:00	Heart Rate Variability Applications (SB2), p. 67	EEH
14:00	Cardiovascular CT and Ultrasound (SB3), p. 68	NH
14:00	ECG in Nontraditional Forms (SB4), p. 68	Jordan
15:00	Closing Plenary (CP), p. 69	Gerthsen