

OPENING THE PERSONAL GATE BETWEEN  
TECHNOLOGY AND HEALTH CARE

# Studies in Health Technology and Informatics

Internationally, health informatics is driven by developments in biomedical technologies and medical informatics research that are advancing in parallel and form one integrated world of information and communication media and result in massive amounts of health data. These components include genomics and precision medicine, machine learning, translational informatics, intelligent systems for clinicians and patients, mobile health applications, data-driven telecommunication and rehabilitative technology, sensors, intelligent home technology, EHR and patient-controlled data, and Internet of Things.

The series Studies in Health Technology and Informatics (HTI) was started in 1990 in collaboration with EU programmes that preceded the Horizon 2020 to promote biomedical and health informatics research. It has developed into a highly visible global platform for the dissemination of original research in this field, containing more than 250 volumes of high-quality works from all over the world.

The international Editorial Board selects publications with relevance and quality for the field. All contributions to the volumes in the series are peer reviewed.

Volumes in the HTI series are submitted (for evaluation) for indexing by MEDLINE/PubMed; Web of Science: Conference Proceedings Citation Index – Science (CPCI-S) and Book Citation Index – Science (BKCI-S); Google Scholar; Scopus; EMCare.

## Series Editors:

B. Blobel, E. Borycki, M. Braunstein, C. Bühler, J.P. Christensen, R. Cooper, R. Cornet, J. Dewen, O. Le Dour, P.C. Dykes, A. Famili, K.W. Fung, M. González-Sancho, E.J.S. Hovenga, J.W. Jutai, Z. Kolitsi, C.U. Lehmann, J. Mantas, V. Maojo, A. Moen, J.F.M. Molenbroek, G. de Moor, M.A. Musen, P.F. Niederer, C. Nøhr, A. Pedotti, N. Peek, O. Rienhoff, G. Riva, W. Rouse, K. Saranto, M.J. Scherer, S. Schürer, E.R. Siegel, C. Safran, N. Sarkar, T. Solomonides, E. Tam, J. Tenenbaum, B. Wiederhold, P. Wilson and L.H.W. van der Woude

## Volume 336

### *Recently published in this series*

- Vol. 335 G. Schreier, M. Baumgartner, D. Hayn and B. Pfeifer (Eds.), dHealth 2026 – Proceedings of the 20th Health Informatics Meets Digital Health Conference
- Vol. 334 A. Copeland, K. Keshavjee, A. Zavar and G. Lin (Eds.), From Silos to Synergy: Building Bridges – Proceedings of the Future of Health Leadership, Informatics and Policy Conference 2026
- Vol. 333 J. Bichel-Findlay (Ed.), Health. Innovation. Community: Engage. Disrupt. Transform – Papers from the 29th Australasian Institute of Digital Health's Health Innovation Community (HIC2025) Conference
- Vol. 332 U.H. Hübner, J.-D. Liebe, A. Benis, N. Egbert, T. Engelsma, P. Gallos, D. Flemming, V. Lichtner, R. Marcilly, O. Tamburis and S. Villumsen (Eds.), Good Evaluation - Better Digital Health – Proceedings of the EFMI Special Topic Conference 2025

ISSN 0926-9630 (print)  
ISSN 1879-8365 (online)

# Opening the Personal Gate between Technology and Health Care

Proceedings of MIE 2026

Edited by

Mauro Giacomini, *Università di Genova, Italy*

Jaime Delgado, *Universitat Politècnica de Catalunya, Spain*

Theodoros N. Arvanitis, *University of Birmingham, UK*

Elisavet Andrikopoulou, *University of Portsmouth, UK*

Arriel Benis, *Holon Institute of Technology, Holon, Israel*

Gabriella Balestra, *Politecnico di Torino, Italy*

Riccardo Bellazzi, *Università di Pavia, Italy*

Parisis Gallos, *University of West Attica, Greece*

Roberto Gatta, *Università di Brescia, Italy*

Daniele Roberto Giacobbe, *Università di Genova, Italy*

Noemi Giordano, *Politecnico di Torino, Italy*

Maria Hägglund, *Uppsala Universitet, Sweden*

Lars Lindsköld, *Uppsala Universitet, Sweden*

*European Federation for Medical Informatic – President*

Lenka Lhotska, *České vysoké učení technické v Praze, Czech Republic*

Sara Marceglia, *Università di Milano, Italy*

Enea Parimbelli, *Università di Pavia, Italy*

Lucia Sacchi, *Università di Pavia, Italy*

Paolo Soda, *Università Campus Bio-Medico di Roma, Italy*

Lăcrămioara Stoicu-Tivadar, *Universitatea Politehnica Timișoara, Romania*

Pierangelo Veltri, *Università della Calabria, Italy*

Patrizia Vizza, *Università della Calabria, Italy*

 Sage

 IOS Press

© 2026 The Authors.

This book is published online with Open Access and distributed under the terms of the Creative Commons Attribution Non-Commercial License 4.0 (CC BY-NC 4.0).

ISBN 978-1-64368-661-5 (online)  
doi: 10.3233/SHTI336



## **IOS Press**

A Sage company  
Teleportboulevard 120  
1043 EJ Amsterdam

Sage  
3rd Floor, HYLO  
103–105 Bunhill Row  
London, EC1Y 8LZ

Sage  
2455 Teller Road  
Thousand Oaks  
California 91320

Sage  
Unit No 323-333, Third Floor, F-Block  
International Trade Tower  
Nehru Place, New Delhi – 110 019

Sage  
8 Marina View Suite 43-053  
Asia Square Tower 1  
Singapore 018960

### **DISCLAIMER**

The authors, editors, and publisher will not accept any legal responsibility for any errors or omissions that may be made in this publication. The publisher makes no warranty, express or implied, with respect to the material contained herein.

# Preface

The 36th Medical Informatics Europe Conference, MIE 2026, will be held from 25 to 28 May 2026 in Genoa, Italy. The Conference is co-hosted by the Italian Scientific Society of Biomedical Informatics (SIBIM) and the European Federation for Medical Informatics (EFMI). The Scientific Programme Committee is chaired by Professor Mauro Giacomini and co-chaired by Professor Jaime Delgado.

The theme of MIE 2026 is “Opening the Personal Gate between Technology and Health Care”. As the editors of the proceedings of MIE 2025: Intelligent Health Systems – From Technology to Data and Knowledge, have already pointed out, artificial intelligence (AI) continues to be overestimated worldwide, even within the scientific community, and greater caution should be exercised in assessing the evolution of the technologies at our disposal. No technology can ever be a panacea for all the problems we face as we employ our tools in the fight to improve the health of humanity and all of creation. To be effective, technological solutions must be integrated into the healthcare process, providing high-quality data that is appropriately contextualised to deliver meaningful information to authorised users. But, as has always been the case in the course of human development, knowledge can only arise from an open dialogue among all those involved in the process. This is precisely the objective of this edition of EFMI MIE2026, which takes place on the 50th anniversary of the EFMI in Genoa, Italy, a city which for centuries has served as a gateway to the Mediterranean basin and all other routes of human enterprise.

These proceedings present the current trends in health and biomedical informatics. The contributions cover topics like biomedical imaging and data science; computable knowledge and decision support; ethics, explainable and trustworthy AI; generative AI and natural language processing; standardisation, interoperability, FAIR data and European health data space; information systems in healthcare; personalised medicine; telemedicine and telehealth; OneHealth; education; and human centred digital health.

The proceedings are published by Sage Publishing / IOS Press as an e-book in the open access series Studies in Health Technology and Informatics (HTI). Volumes in the HTI-series are submitted (for evaluation) for indexing by MEDLINE/PubMed; Web of Science: Conference Proceedings Citation Index – Science (CPCI-S) and Book Citation Index – Science (BKCI-S); Google Scholar; Scopus, and EMCare.

The Editors,

Mauro Giacomini, Jaime Delgado, Theodoros N. Arvanitis, Elisavet Andrikopoulou, Arriel Benis, Gabriella Balestra, Riccardo Bellazzi, Parisis Gallos, Roberto Gatta, Daniele Roberto Giacobbe, Noemi Giordano, Maria Hägglund, Lars Lindsköld, Lenka Lhotska, Sara Marceglia, Enea Parimbelli, Paolo Soda, Lăcrămioara Stoicu-Tivadar, Pierangelo Veltri, Patrizia Vizza.

Genoa, 8 April 2026

# About the Conference

## The Conference

The Italian Scientific Society of Biomedical Informatics (SIBIM), together with the European Federation for Medical Informatics (EFMI), organised the 36<sup>th</sup> Medical Informatics Europe Conference (MIE2026) MIE2026, which took place from 25 to 28 May 2026 in Genoa, Italy. The theme of the conference was “Opening the Personal Gate between Technology and Health Care” (<https://mie2026.efmi.org/>). The conference was managed by the professional conference organiser Pragma Congressi, Pavia, Italy.

Founded in 1976, EFMI is the leading organisation in medical informatics in Europe, and represents 33 countries through their respective national health informatics associations. EFMI is a not-for-profit organisation concerned with the theory and practice of information science and technology within healthcare and health sciences in a European context.

MIE is a series of medical informatics conferences that aim to promote research and development in biomedical and health informatics. Members of the global medical informatics community are invited to take part in each conference as presenters or participants. Each conference consists of scientific sessions with oral presentations of peer-reviewed full papers and short communication papers. Each conference also includes panels, workshops, demos, and tutorials, some prepared by EFMI working groups. A large exhibition of peer-reviewed posters also forms part of each conference.

Conference Topics included (but were not limited to):

- ARTIFICIAL INTELLIGENCE IN MEDICINE
  - Biomedical imaging in medical informatics
  - Computable knowledge and decision support
  - Data science for visualisation and analytics
  - Ethics, regulations and AI
  - Explainable and trustworthy AI
  - Generative AI, foundational models
  - Learning health systems
  - Natural language processing applications in healthcare
- INFRASTRUCTURES AND REGULATIONS
  - FAIR data and data sharing infrastructures, European Health Data Space
  - Healthcare data security
  - Information Infrastructure Integration and certification

- Information systems in healthcare
- Privacy and data protection methods and technologies for healthcare
- Standardisation and interoperability issues in medical informatics
  
- HEALTH INFORMATICS ECOSYSTEMS
  - Automation and robotics in healthcare
  - Digital twins
  - Digitally supported Precision Medicine
  - Internet of Medical Things
  - Medical devices (including software)
  - Patient empowerment
  - Personal health records and mHealth
  - Telemedicine and telehealth
  
- ONEHEALTH
  - Human factors, social and organisational issues
  - Population health
  - Translational health informatics
  - Veterinary and environmental health informatics
  
- EDUCATION
  - Health Informatics in medical education
  - Innovative technologies and approaches for education
  - Living labs and patients' inclusion and engagement
  - Multimodal Learning in healthcare
  
- HUMAN CENTRED DIGITAL HEALTH

The MIE2026 conference included three keynote speeches by internationally recognised experts in medical informatics:

- **Silvana Quaglini** has an MS degree in Electronic Engineering and PhD in Bioengineering, and is a full professor of Medical Informatics at the University of Pavia, Italy. Her research focuses on decision support systems, home monitoring and care, and the economic evaluation models of healthcare interventions. The main medical areas covered by these applications include cancer, stroke, chronic diseases, and cognitive rehabilitation. The recent push towards personalised medicine has directed her latest studies toward shared decision-making and context-aware home monitoring. She has consistently conducted applied research, mainly within EU-funded projects, collaborating with local and international hospitals. She is a past-president of SIBIM (Italian Society of Biomedical Informatics, EFMI member), member of the GNB (National Bioengineering Group), and the author of approximately 350 scientific publications, with an h-index of 47 (2025, Scopus).

- **Johan Gustav Bellika** has worked at the intersection between medicine, medical research and informatics since 1992, when he joined the Department of Community Medicine at UiT The Arctic University of Norway. He has worked at the Norwegian centre for e-health research at the University Hospital of North Norway since 1997. In the period between 2007 and 2013 he joined the department of computer science to teach and research in relation to the international master programme in Telemedicine and e-health. He is now a professor in medical informatics at the department of clinical medicine, Faculty of health sciences at UiT The Arctic University of Norway and the Norwegian Centre for E-health Research at the University hospital of North Norway. His current research focus is on technology to enable privacy-preserving reuse of health data and supporting a learning healthcare system.
- **Giorgio Cangili** is a Senior Consultant in Digital Health and Social Care and an internationally recognised expert in healthcare interoperability and standards. He actively contributes to European initiatives supporting the European Health Data Space (EHDS). He is an HL7 Fellow, Technical Lead and Board Member of HL7 Europe, and a member of the HL7 International Technical Steering Committee. He also chairs the European eHMSEG (eHealth Member States Expert Group) Semantic Task Force Architecture Working Group. With more than 25 years of experience, Giorgio specialises in ICT, standards, and business process re-engineering in health and social care. Throughout his career, he has contributed to standardisation activities within HL7, CEN, ISO, IHE, and DICOM, and has facilitated multiple European and global standardisation initiatives. He is one of the authors of the International Patient Summary (IPS) standards (ISO/EN 27269 and HL7 IPS FHIR Implementation Guide).

### Scientific Programme Committee

- Mauro Giacomini: Department of Informatics, Bioengineering, Robotics and System Engineering, University of Genoa, Italy
- Jaime Delgado: Universitat Politècnica de Catalunya, Spain
- Theodoros N. Arvanitis: Department of Electronic, Electrical & Systems Engineering, School of Engineering, University of Birmingham, UK
- Elisavet Andrikopoulou: Faculty of Technology, School of Computing, University of Portsmouth, UK
- Arriel Benis: Department of Digital Medical Technologies, Holon Institute of Technology, Holon, Israel
- Gabriella Balestra: Politecnico di Torino, Italy
- Riccardo Bellazzi: University of Pavia, Italy
- Parisis G. Gallos: ICU Follow up – Care Research Lab, Department of Nursing, University of West Attica, Greece
- Roberto Gatta: University of Brescia, Italy
- Maria Hägglund: Uppsala Universitet, Sweden

- Lars Lindsköld: European Federation for Medical Informatic – President, Board Member of Svensk Förening för Medicinsk Informatik - Sweden
- Lenka Lhotska: České vysoké učení technické v Praze, Czech Republic
- Sara Marceglia: Univesity of Milan, Italy
- Lucia Sacchi: Univesity of Pavia, Italy
- Paolo Soda: Campus Bio-Medico Univesity of Rome, Italy
- Lăcrămioara Stoicu-Tivadar: University Politehnica Timișoara, Romania
- Pierangelo Veltri: University of Calabria, Italy

## Editors

- Mauro Giacomini: Department of Informatics, Bioengineering, Robotics and System Engineering, University of Genoa, Italy
- Jaime Delgado: Universitat Politècnica de Catalunya, Spain
- Theodoros N. Arvanitis: Department of Electronic, Electrical & Systems Engineering, School of Engineering, University of Birmingham, UK
- Elisavet Andrikopoulou: Faculty of Technology, School of Computing, University of Portsmouth, UK
- Arriel Benis: Department of Digital Medical Technologies, Holon Institute of Technology, Holon, Israel
- Gabriella Balestra: Politecnico di Torino, Italy
- Riccardo Bellazzi: University of Pavia, Italy
- Parisis G. Gallos: ICU Follow up – Care Research Lab, Department of Nursing, University of West Attica, Greece
- Roberto Gatta: University of Brescia, Italy
- Daniele Roberto Giacobbe: Department of Health Sciences (DISSAL), University of Genoa, Italy
- Noemi Giordano: Politecnico di Torino, Italy
- Maria Hägglund: Uppsala Universitet, Sweden
- Lars Lindsköld: European Federation for Medical Informatic – President, Board Member of Svensk Förening för Medicinsk Informatik - Sweden
- Lenka Lhotska: České vysoké učení technické v Praze, Czech Republic
- Sara Marceglia: Univesity of Milan, Italy
- Enea Parimbelli: Univesity of Pavia, Italy
- Lucia Sacchi: Univesity of Pavia, Italy
- Paolo Soda: Campus Bio-Medico Univesity of Rome, Italy
- Lăcrămioara Stoicu-Tivadar: University Politehnica Timișoara, Romania
- Pierangelo Veltri: University of Calabria, Italy
- Patrizia Vizza: University of Calabria, Italy

## Editorial Committee

- Mauro Giacomini, MIE 2026 Chair, SIBIM President, Department of Informatics, Bioengineering, Robotics and System Engineering, University of Genoa, Italy.
- Elisavet Andrikopoulou, EFMI Publications Officer, EFMI Exec Board Member, Faculty of Technology, School of Computing, University of Portsmouth, UK.
- Parisis Gallos, Past EFMI Publications Officer; ICU Follow up – Care Research Lab, Department of Nursing, University of West Attica, Greece.

## Peer Review Process

We received 884 submissions from 57 countries. A thorough review process was conducted with valuable support from 385 active reviewers. Almost all submissions were reviewed by at least three reviewers and assessed by one SPC co-chair. Based on their recommendations, final decisions were made by SPC members during a three-day virtual meeting. Papers requiring major revision underwent a further review by SPC members.

Finally, from among the 582 full papers, 103 short communication papers, 80 posters, 34 demonstrations, 25 panels, 54 workshops, and 6 tutorials submitted, 415 full papers (acceptance rate of 71%), 91 short communication papers (conversion of 29 full papers), 117 posters (conversion of 50 full papers and 15 short communications), 29 demonstrations, 26 panels (conversion of 3 workshops), and 26 workshops were accepted. All accepted full papers, short communication papers, and posters are included in these proceedings. Notably, this collection encompasses contributions originating not only from Europe (the primary geographic focus of Medical Informatics Europe 2026) but also from various other continents. This international participation highlights the global significance of sharing knowledge and practical experiences related to scientific and implementation challenges in healthcare informatics. We firmly believe that such global exchange provides valuable insights and meaningful learning opportunities for the European community and beyond.

We want to thank the Editors and the Editorial Committee, and all the reviewers for their invaluable contributions to MIE2026.

## Peer Reviewers (alphabetic)

First Name	Last Name
Saadullah Farooq	Abbasi
Jim	Achterberg
Rose-Mharie	Åhlfeldt

Hafsa	Akebli
Giuseppe	Albi
Marta	Alić
Laurence	Alpay
Yasser	Alsafadi
Sahar	Alsharif
Elske	Ammenwerth
Daniel	Amsel
Elisavet	Andrikopoulou
Michael	Anywar
Johanna	Apfel-Starke
Abhichaya	Areauey
Theodoros N.	Arvanitis
Vasilis	Athnasiou
Rosalynn	Austin
Serge	Autexier
mohammadreza	Azarpira
František	Babič
Sofia	Backåberg
Linxue	Bai
Gabriella	Balestra
Adeola	Bamgboje-Ayodele
Franziska	Bathelt
Melissa	Baysari
Riccardo	Bellazzi
Patrice	Bellot
Mohamed	Ben Said
Arriel	Benis
Laura	Bergomi
Jonas	Bienzeisler
Antonis	Billis
Tetiana	Biloborodova
Michelle	Bindel
Olivier	Blanson Henkemans
Michael	Blaß
Bernd	Blobel
Panos	Bonotis
Pietro	Bosoni
Oliver Johannes	Bott

Tobias	Brix
Karin	Brodén
Thomas	Brox Røst
Tommaso Mario	Buonocore
Xabier	Calle
Silvia	Cannone
Elena	Cardillo
Jean	Charlet
Helen	Chen
Ya Lin	Chen
Ching lung	Cheng
Ha Na	Cho
Marina	Copping
Ariana	Cordos
Ronald	Cornet
Lorenzo	Corso
Sébastien	Cossin
Mihaela	Crişan-Vida
Marc	Cuggia
Chiara	Dachena
Arianna	Dagliati
Stefano	Dalmiani
Andrea	Damiani
Nadia	Davoody
Marida	De Maria
Jaime	Delgado
Kerstin	Denecke
Matt	Dennis
Eva	Dieker
Xuefei	Ding
Martin	Dugas
Edgar	Dulce Villarreal
Trung Toan	Duong
Kees	Ebben
Thomas	Engelsma
Jeppe	Eriksen
Martin	Ernst
Thibaut	Fabacher
Muhammad	Faisal

Simone	Falco
Göran	Falkman
Mohammad	Faysel
Georgios	Feretzakis
Mircea	Focsa
Rowena	Forsyth
Alberto	Freitas
Kate	Fultz Hollis
Jan	Gaebel
Olga	Galani
Parisis	Gallos
Carolina	Garcia Sanchez
Roberto	Gatta
Roberta	Gazzarata
Mert	Gencturk
Gersende	Georg
Christina	Georgakopoulou
Charalabos	Georgiadis
Johanna	Gerlach
Sebastian	Germer
Marco	Ghislieri
Maedeh	Ghorbanian Zolbin
Daniele Roberto	Giacobbe
Costanza	Giacomini
Mauro	Giacomini
Raffaele	Giancotti
Kerstin	Gierend
Harm	Gijsbers
Noemi	Giordano
Yang	Gong
Anna	Górska
Natalia	Grabar
Donatella	Granata
Moritz	Grob
Cynthia	Groenevelt
Alessandra Agnese	Grossi
Elias	Grünewald
Christopher	Gundler
Charles	Gutteridge

Marcel	Haas
Werner O	Hackl
Maria	Hägglund
Josefin	Hagström
Eisuke	Hanada
Janna	Hastings
Dieter	Hayn
Hauke	Heidemeyer
Elisa	Henke
Mira	Hercigonja-Szekeres
Lukman	Heryawan
Asmâa	Hidki
Daniel	Hieber
Jacob	Hofdijk
Ursula	Hübner
Sinead	Impey
Alessandra	Introvaia
Franziska	Jahn
Prabath	Jayathissa
Xia	Jing
Sébastien	Jodogne
Park	Joon Ho
Henry	Joutsijoki
Charles	Kahn
Dimitris	Kalathas
Athanasios	Kallipolitis
Bridget	Kane
Aikaterini	Kanta
Kalliopi	Kastampolidou
Afroditi	Katika
Aglaia	Katsiroumpa
Oladimeji	Kazeem
Martijn G.	Kersloot
Hamidreza	Khaleghzade
Anna	Kharko
Santisith	Khiewkhern
Rinat	Khusainov
Eun Man	Kim
G	Kim

Ulla-Mari	Kinnunen
Petra	Knaup
Akoï	Koivogui
Aikaterini	Kolokathi
Miroslav	Končar
Shozo	Konishi
Appoh	Kouamé
Frank	Kramer
Evgeniy	Krastev
Markus	Kreuzthaler
Harsha	Krishna
Jörn	Krückeberg
Tomohiro	Kuroda
Huda	Kutrani
Hallvard	Lærum
Guillaume	Lamé
Antoine	Lamer
Odartey	Lampzey
Alberto	Lavelli
Elena	Lazarova
Simon	Lewerenz
Lenka	Lhotska
Paschalina	Lialiou
Jingyi	Liang
Valentina	Lichtner
Livia	Lilli
Lars	Lindsköld
Hao	Liu
Silvia	Llorente
Matthias	Löbe
Julia	Logan
Christina	Lohr
Candice	Louw
Jamie	Luckhaus
Riccardo	Lunardi
Lene	Lunde
Diana	Lungeanu
Christian	Lüpkes
Ekaterina	Lyutsova

Hamza	Maatouk
Mário	Macedo
Andriana	Magdalinou
Norbert	Maggi
Nancy	Mah
Sadouanouan	Malo
Jonathan M.	Mang
Patrick	Mangesius
John	Mantas
Sara	Marceglia
Romarie	Marcilly
Aniek	Markus
Carola	Martin
Emmanouil	Mastropavlos
Jakir Hossain	
Bhuiyan	Masud
Enkeleint A.	Mechili
D.S	Mendis
Andreas	Menychtas
George	Mihalas
Atiehsadat	Mirkhani
Reyhaneh	Mohammadi
Alaa	Mohasseb
Maryati	Mohd Yusof
Carlos	Molina
Helen	Monkman
Maria Eugenia	Monteverde
Sara	Mora
Laura	Moss
Masami	Mukai
Teesta	Mukherjee
Dominik	Müller
Ylenia	Murgia
Petteri	Mussalo
Eustache	Muteba Ayumba
Haythem	Nakkas
Daniel	Naro
Pantelis	Natsiavas
Sarah	Nee

Michaela Christina	Neff
Daniel	Neumann
Giovanna	Nicora
Anna	Niemeyer
Lina	Nilsson
Lisa-Maria	Norz
Aynaz	Nourani
Leonardo	Nucciarelli
Chinasa	Odo
Tessa	Ohlsen
Corine	Oldhoff-Nuijsink
Francesco	Olivato
Stefania	Orini
Thomas Alassane	Ouattara
Melissa	Ouellet
Daniele	Pala
Gabriella	Paoli
Antonios	Pardos
Enea	Parimbelli
Carlos Luis	Parra-Calderón
Khadijeh	Paydar
Samuele	Pe
Fabrizio	Pecoraro
Niels	Peek
Laura-Maria	Peltonen
Anuwat	Pengput
Lorenzo	Peracchio
Mona	Perbix
Michele	Persiani
Francesca	Pescol
Cătălin-Mihai	Pesecan
Carolyn	Petersen
Agnese	Piersanti
Jessica	Pinaire
Francesco	Pinciroli
Maija	Poikela
Sasanka	Potluri
Omid	Pournik
Gouri	Prakash

Mirela	Prgomet
Claire	Price
Michael	Prinz
Dimitrios	Proios
Mareike	Przysucha
Vytenis	Punys
Silvana	Quaglini
Manuel	Quesada-Martínez
Bahlol	Rahimi
Jean Louis	Raisaro
Simone	Rancati
Nadav	Rappoport
Giuseppe	Rauch
Dennis	Rausch
Alexandros	Rekkas
Layla Tabea	Riemann
Emmanouil	Rigas
Zully	Ritter
Octavio	Rivera-Romero
Ana	Rocha
Nancy	Roderer
Alejandro	Rodríguez González
Rainer	Röhrig
Marina	Romanchikova
Jorge	Ropero
Samanta	Rosati
Hossein	Rouhizadeh
Carmelina	Ruggiero
Martin	Saban
Lucia	Sacchi
Gabriele	Santangelo
Kaija	Saranto
Julian	Saß
Stefan	Sauermann
Agnese	Sbrollini
Lorenzo	Scarciglia
André	Scherag
Jan	Schladetzky
Björn	Schreiweis

Stephan	Schug
Diane	Schwartz
Marco	Schweitzer
Therese	Scott Duncan
Karima	Sedki
Björn	Sellemann
Danielle	Sent
Brigitte	Seroussi
Ko	seung hyoung
Yuheng	Shi
Kirubel Biruk	Shiferaw
Michael	Shifrin
Amnon	Shvo
Stefan	Sigle
Gülbahar Merve	Şilbir
Inna	Skarga-Bandurova
Matthijs	Sloep
Neil	Smalheiser
Georgia	Sovatzidi
Nicolai	Spicher
Cord	Spreckelsen
Marco	Spruit
Sebastian	Stäubert
Milton	Stern
Lacramioara	Stoicu-Tivadar
Vasile	Stoicu-Tivadar
Cosima	Strantz
Aslı	Suner Karakulah
Stephen	Swift
Emmanuelle	Sylvestre
Nicholas	Talam
Oscar	Tamburis
A. Rosemary	Tate
Erica	Tavazzi
Luciana	Terceiro
Gaurang	Thanekar
Judith	Thomas
Sylvia	Thun
Johannes	Thye

Anna	Tidstam
Isotta	Trescato
Maria Nikoletta	Triantafylloupoulou
Lucas	Triefenbach
Karen	Triep
Maria	Tsirintatni
Kukiat	Tudpor
Niruwan	Turnbull
Giovanni	Turra
Erik	Tute
Mohy	Uddin
Adrien	Ugon
Philipp	Urbauer
Florian	van Daalen
Liesbeth	van den Berg
Johan	van Soest
Nicole	Veggiotti
Johanna	Viitanen
Patrizia	Vizza
Hanna	von Gerich
Xiaomeng	Wang
Zhan	Wang
Yannik	Warnecke
Patrick	Weber
Joshua	Wiedekopf
Alfred	Winter
Mobin	Yasini
Anthony	Yazdani
Yılmaz Kemal	Yüce
Dimitrios	Zarakovitis
Emmanouil	Zoulas
Dorian	Zwanzig

## Venue

The MIE 2026 conference is hosted at the Congress Center “Magazzini del Cotone”, Genoa, Italy.

## **Sponsors**

- Genova Municipality
- Frontiers in Digital Health
- HL7 Italy
- Philips
- Genova Engineering Board
- BMC Springer
- El.Co.
- Esaote Ebit
- Healthropy

## **Addresses for correspondence:**

Organising Committee E-mail Address: [mie2026.loc@online-registry.net](mailto:mie2026.loc@online-registry.net)

# Contents

Preface	v
<i>Mauro Giacomini, Jaime Delgado, Theodoros N. Arvanitis, Elisavet Andrikopoulou, Arriel Benis, Gabriella Balestra, Riccardo Bellazzi, Parisis Gallos, Roberto Gatta, Daniele Roberto Giacobbe, Noemi Giordano, Maria Hägglund, Lars Lindsköld, Lenka Lhotska, Sara Marceglia, Enea Parimbelli, Paolo Soda, Lăcrămioara Stoicu-Tivadar, Pierangelo Veltri, Patrizia Vizza</i>	
About the Conference	vi
<b>Section 1. Biomedical Imaging and Data Science</b>	
Interactive Visualization of Patient Safety Events in MAUDE	2
<i>Jeanette Thomas, Yuheng Shi, Zhengcan Xie, Barani Mayilvaganan, Muhammad Amith, Lei Hua and Yang Gong</i>	
Seeing Is Believing – FAIR Metadata for Medical Imaging Data in the SPHN Semantic Interoperability Framework	7
<i>Edwin Ter Voert, Harald Witte, Vasundra Touré, Bjoern Menze and Sabine Österle</i>	
YOLO-LXR: An Enhanced Model for Pathology Detection in Chest X-Rays	12
<i>Gerasimos Katsagannis and Barry L. Bentley</i>	
DBSCAN Applied to EHRs Data from Patients with Glioblastoma Finds Clusters Based on Cytosolic Hsp70 Protein, Sex, and Brain Subventricular Zone	17
<i>Davide Chicco and Luca Oneto</i>	
Is Temporal Variability a Standalone Predictor in Medical Data? An Actigraphy Study in Bipolar Disorder	22
<i>Carmen-Anna Konicarová, Jakub Schneider, Marian Kolenič, Filip Španiel and Eduard Bakštein</i>	
Prediction of Postoperative Complications Following Mandibular Fractures Using Machine Learning	27
<i>Magdalena T. Weber, Philipp Thoenissen, Philip Terwey, Axel Zieschank, Robert Sader and Jannik Schaaf</i>	
Estimating Transepidermal Water Loss from Smartphone Facial Images Using Self-Supervised Features and a Mixture Density Network	32
<i>Kim Wonjik, Takimoto Baku, Sato Mai, Ito Shotaro and Nosato Hirokazu</i>	
Fully Automated Colon Delineation and Volume Estimation in T2-Weighted MRI with a 2D U-Net	37
<i>Maciej Plocharski, Gry B. Hvaas, Maria G. Møller, Nicolaj S. Thostrup, Frederik Samuelsen and Esben B. Mark</i>	

Pharmacovigilance Assistant: An Agentic Workflow for Reproducible Drug Safety Summaries	42
<i>Xabier Calle, Naroa Mendez and Alba Garin-Muga</i>	
Statistical Models Addressing Acute Respiratory Diseases: A Scoping Review	47
<i>Monique Boese, Debora Ribeiro Carvalho, Adriano Marçal Pimenta and Luciana Schleder Gonçalves</i>	
Representation of Ordinal Features: Supervised Embeddings in the Survival Prediction of Prostate Cancer Patients	52
<i>Louisa Schwarz</i>	
Assessing Plausibility of Clinical Fact Dates in Real World Data	57
<i>Matthias Hüser, Lydia González and Matvey B. Palchuk</i>	
Interactive Tool for Flexible Developmental Assessment in Youth Health Care	62
<i>Iris Eekhout and Yvonne Schönbeck</i>	
A Co-Design Approach to the Digital Transformation of a National Public Health Surveillance Report	67
<i>Cecilia Rago, Vanashree Sexton, Jessica Smylie, Timea Suli, Karina O'Neill, Pushpa Kumarapeli and Simon de Lusignan</i>	
Finding Associative and Causal Effects of Temporal Changes in Health Features for Prevalent and Incident Cancer in Males: A Machine Learning Approach	72
<i>Abouzar Choubineh, Syed Sibte Raza Abidi, Ellen Sweeney and Samina Abidi</i>	
Overcoming Domain Shift in Atypical Mitotic Figure Detection with Deep Ensemble Learning	77
<i>Sara Krauss, Ellena Spiess, Daniel Hieber, Johannes Schobel, Frank Kramer and Dominik Müller</i>	
Dementia Prediction Using Gait Analysis and Machine Learning	82
<i>Mustafa Al-Hammadi, Hasan Fleyeh and Ilias Thomas</i>	
Colorectal Cancer Survival Prediction Using Multimodal Fusion	87
<i>Miljana Shulajkovska, Matej Jelenc, Jitendra Jonnagaddala and Anton Gradišek</i>	
Towards the Definition of a Prognostic Model for Mantle Cell Lymphoma	92
<i>Simone Ferrero, Riccardo Francia, Marco Ladetto, Giorgio Leonardi, Stefania Montani, Stefano Nera, Luca Piovesan and Manuel Striani</i>	
Effects of Non-IID Distributions in Lung Cancer Data on Survival Prediction with Federated Ensemble Learning	98
<i>Linus Weber, Anne-Christin Hauschild, Michael Altenbuchinger, Ulrich Sax and Jonas Hügel</i>	
Characterizing Real-World Data by Care Setting to Support Clinical Research	103
<i>Lorena Prior Muñoz, Lydia González Cid, David Perez-Rey and Matvey Palchuk</i>	

Developing an AI-Trained Movement Screening Tool, Based on Skeleton Avatar Technique, to Evaluate and Promote Sustainable Physical Functioning in Daily Life	108
<i>Sofia Backåberg, Gunilla Elmgren Frykberg, Katarina Eriksson Östh, Welf Löwe, Cecilia Fagerström, Joakim Niklasson and Alisa Lincke</i>	
Predicting 2-Year Overall Survival in NSCLC from CT Scans Using 2D CNNs and Soft Attention	113
<i>Domenico Paolo, Carlo Greco, Edy Ippolito, Michele Fiore, Sara Ramella, Paolo Soda, Matteo Tortora, Alessandro Bria and Rosa Sicilia</i>	
Explainable Hierarchical Swin Transformer for Multi-Scale Breast Cancer Histopathology Classification	118
<i>Narges Movahedkor, Reza Shahbazian and Irina Trubitsyna</i>	
Automated Machine Learning Approaches for Surgery Duration Prediction in Orthopaedics	123
<i>Rohan Barrowcliff, Thomas Lovegrove and Holger Kunz</i>	
Subgroup-Based Meta-Learning with Domain-Specific Self-Supervised Learning for Sarcopenia Detection from Musculoskeletal Ultrasound	128
<i>Pardis Moradbeiki, Uffe Kock Wiil, Nasser Ghadiri, Sayed Jalal Zahabi, Kristoffer Kittelmann Brockhattingen and Ali Ebrahimi</i>	
Prediction of Left Ventricular Systolic Dysfunction from ICU Electrocardiograms Using Vision Transformer Embeddings and Multimodal Features	133
<i>Jacopo Lenkowitz and Nicoletta di Giorgi</i>	
Integrating Anomaly Detection and LLM-Based Explanation Generation in Clinical Data Dashboards	138
<i>Hamidreza Maharlou, Paula Fierek, Hannah Benedictine Maier and Steffen Oeltze-Jafra</i>	
Integrating Radiomics and Machine Learning to Improve Fluorescence Image Segmentation in in vitro models	143
<i>Alessandra Introvaia, Gerardina Ruocco, Letizia Nicoletti, Samanta Rosati, Valeria Chiono and Gabriella Balestra</i>	
Distinguishing Pain and No Pain in Musicians Through Machine Learning Analysis of Musculoskeletal Data	148
<i>Kaya Gärtner, Nikolaus Ballenberger and Ursula H. Hübner</i>	
AI and Digital-Twin Synergy for Field Optimisation for Targeted Drug Delivery	153
<i>Robert Leonard Bernad, Lăcrămioara Stoicu-Tivadar, Mihaela Crișan-Vida and Sandor Ianos Bernad</i>	
ViTMARE – A Vision Transformer Pipeline for Anomaly Detection in 3D Brain MRI	158
<i>Lorenzo Peracchio, Lorenzo Corso, Gabriele Santangelo, Sithin Thulasi Seetha, Chandra Bortolotto, Arianna Dagliati, Riccardo Bellazzi and Giovanna Nicora</i>	
Enhancing Unsupervised Segmentation Frameworks for Volumetric Medical Images via Superpixel Segmentation and Agglomerative Clustering	163
<i>Minh-Tri Nguyen, Phung-Anh Nguyen and Ngoc-Hoang Le</i>	

Non-Invasive Prediction of Embryo Ploidy from Time-Lapse Videos Using Video Vision Transformers (ViViT)	168
<i>Teresa García-Navarro, Eduardo Alonso, Ane Goikolea-Vives, Gorka Barrenetxea, Ibai Gurrutxaga, Andoni Beristain and Alba Garin-Muga</i>	
Environmental Personal Exposure Clusters to Investigate Multiple Sclerosis and Amyotrophic Lateral Sclerosis Progression	173
<i>Pietro Bosoni, Mahin Vazifehdan, Helena Aidos, Inês Alves, Giovanni Birolo, Guglielmo Faggioli, Sergio González-Martínez, Marta Gromicho, Aleksandar Jovanović, Borko Kostić, Enrico Longato, Umberto Manera, Eleonora Tavazzi, Erica Tavazzi, Riccardo Bellazzi, Roberto Bergamaschi, Maria Fernanda Cabrera, Adriano Chiò, Mamede de Carvalho, Barbara di Camillo, Piero Fariselli, Nicola Ferro, Sara C. Madeira and Arianna Dagliati</i>	
Data Integrity in Medical AI	178
<i>Lenka Lhotska</i>	
Building an Ontology-Based Cohort of Liver Cancer Imaging Data for AI Development on the European Federated Platform EUCAIM	183
<i>Aniss Guedjali, Kévin Mondet, Aurélie Beaufriere, Jules Gregory, Sébastien Mule, Valérie Paradis, Laure Fournier, Christel Daniel and Mirna El Ghosh</i>	
An Innovative 3D Slicer Plugin for Brain Images Annotation and Lesions Study	188
<i>Marida de Maria, Gianluigi Attanasio, Martina de Salazar, Pierangelo Veltri, Marco Mercuri and Patrizia Vizza</i>	
The Gender Gap in Inpatient Fall Risk Assessment: Results from a Retrospective Analysis of EHR Data	193
<i>Rahel Jana Gubser, Fadel Arnaout, Alessia Nowak, Daniel Fürstenau and Matthias Schulte-Althoff</i>	
Comparison of Loss Functions for Fibroglandular Tissue Segmentation in MRI	198
<i>Alexia Rizoudis, Ramona Wudy, Carl Mathis Wild, Frank Kramer, Nina Ditsch, Thomas Wendler and Dominik Müller</i>	
Test-Time Data Quality Degradation in Clinical ML: A Systematic Robustness Analysis on MIMIC-IV	203
<i>Nour Idris Pacha, Saber Aloui, Asma Rabaoui, Antony Escudie and Jérémie Riou</i>	
Integrating ARIMA and Deep Learning Models for Counterfactual Evaluation of Nirsevimab's Early Impact on RSV Infant Admissions	208
<i>Gilles Cohen and Martine Fallot</i>	
A Data-Driven Visit Windowing Approach Applied to Cochlear Implant Follow-Up Data	213
<i>Annette Günther, Oliver J. Bott, Eugen Kludt, Sarah Vormelcher, Cornelia Batsoulis and Andreas Büchner</i>	

Prediction of Early Functional Outcome After Acute Ischemic Stroke Using Real-World Clinical Data in Vietnam and Indonesia: Retrospective Cohort Study	218
<i>Annisa Ristya Rahmanti, Lutfan Lazuardi, Cong Minh Tran, Hanifah Wulandari, Ika Agustin A. Putri, Farida Niken A.N. Hati, Mai Duy Ton and Huan X. Nguyen</i>	
Feasibility of Causality-Aware Machine Learning for Drug Safety on OMOP-CDM	223
<i>Alexandros Rekkas, Nikolas Theologitis, Anastasia Farmaki, Loukas Kavouras, George Giannopoulos, Manolis Terrovitis and Pantelis Natsiavas</i>	
Explainable ML for Predicting Vision Loss in Pediatric NF-1 Patients Using OCT Data	228
<i>Ayelet Goldstein, Carlos Fresno Canada, Joan Prat Bartomeu, Héctor Salvador, Ana Llorca Cardenosa, Enric Puigventós Rosanas and Joan Gispets Parcerias</i>	
Client Participation per Round in Federated Learning for Multiple Sclerosis with Real-World Data	230
<i>Ashkan Pirmani, MSBase Study Group, Yves Moreau and Liesbet M. Peeters</i>	
Lightweight Medical Image Segmentation with UNet Architecture	232
<i>Yingwei Yang, Guodao Zhang, Winfried Post, Fried-Michael Dahlweid, Hong Sun, Zongpeng Li and BOLUN Zheng</i>	
Sub-Phenotyping of Pediatric Celiac Disease with Topological Data Analysis	234
<i>Daniele Pala, Giuseppe Albi, Valentina Brembilla, Erika Lenzi, Emanuele Medolago, Chiara Sirtoli and Arianna Dagliati</i>	
Harmonized Data Quality Assessments on Emergency Data Across Multiple Hospitals	236
<i>Kais Tahar, Wiebke Schirrmeister, Saskia Ehrentreich, Susanne Drynda, Jonas Bienzeisler, Felix Walcher and Rommy Otto</i>	
Osteoarticular Infections in MIMIC-IV, A Clinical and Microbiological Analysis	238
<i>Mohammadreza Azarpira and Jean-Claude Gascoin</i>	
An Assessment of Trajectory Analysis for Disease Risk Prediction: A Scoping Review	240
<i>Freya Pollington, Spiros C. Denaxas, Kezhi Li, Johan H. Thygesen, Georgios Lyratzopoulos and Becky White</i>	
Supervised Learning Provides Small but Consistent Improvements to Clustering when Predicting Chronic Pain Outcomes Following Treatment	242
<i>Ilias Thomas, Roger Nyberg, Riccardo Lomartire, Tony Bohman, Elena Tseli, Johan Årnlöv, Anna Grimby-Ekman, Linda Vixner, Marika Hagelberg and Björn Ång</i>	
Extending Grad-CAM to DualNet	244
<i>Adrian Schulz, Christian Krettek and Dominik Wolff</i>	
Automated Segmentation of Tissue Zones in Distraction Osteogenesis	246
<i>Leonie Ramin, Jan-Moritz Ramge, Claudia Neunaber and Dominik Wolff</i>	

Norovirus in the UK Biobank: Silver-Standard Labels, Semi-Supervised Models <i>Sarah Nee, Michael Marscholke, Thomas Illig and Dominik Wolff</i>	248
Recognition of Microexpressions Using Nonlinearly Transformed Zygomaticus Muscle Activation <i>Sarva Kiruthika Aruldass, Karthick P A and Ramakrishnan Swaminathan</i>	250

## Section 2. Computable Knowledge and Decision Support

Antibiotic Stewardship and Length of Stay in Osteoarticular Infections: Predictive Modeling and Multivariate Analysis of Mismatch and Optimization Delay <i>Mohammadreza Azarpira and Jean-Claude Gascoin</i>	253
Temporal Query Answering for the Scheduling of Multiple Clinical Guidelines <i>Andrea Terenziani</i>	258
Digital GO: A Clinical Decision-Support Dashboard for Gynecologic Oncology Tumor Board <i>Chiara Dachena, Alice Luraschi, Carolina de Maria, Massimo Criscione, Andrea Rosati, Federica Tomassini, Giovanni Paolo Tobia, Stefano Patarnello, Anna Fagotti and Livia Lilli</i>	263
A Comparison of Different Models to Recommend Variables for Research Data Requests to German Cancer Registries <i>Timo Wolters, Klaas Dählmann, Christian Lüpkes and Andreas Hein</i>	268
Reuse of EUCAIM Ontology for Prescreening Use Case <i>Morgan Vaterkowski, Mirna El Ghosh, Nadir Ammour, Laure Fournier, Emmanuelle Kempf and Christel Daniel</i>	273
Bridging Expertise with Algorithms: Evaluation of Generative AI in Nursing Decisions <i>R. Filshinski, S. Barnoy and M. Saban</i>	278
Can LLMs Turn French PET/CT Narrative Reports into Structured Knowledge? <i>Jean-Philippe Goldman, Pablo Jané Soler, Inès Castarède, Jamil Zagher, Nikola Bjelogrić, Valentina Garibotto and Christian Lovis</i>	283
Distribution Shift Analysis in Generalizable Modelling: Intensive Care Time-Series Data <i>Mayra Elwes, Jonas Alfitian, Karen Hornung, Bhanu Koppolu, Oya Beyan and Ekaterina Kutafina</i>	288
Knowledge Graph for Cardiovascular Drug Safety and Pharmacovigilance: A Scoping Review <i>Maryam Jafarpour, Fatemeh Sarani Rad, Mozghan Esmaeili and Ehsan Bitaraf</i>	293
Data-Driven and Expert-Informed Causal Discovery for Type 2 Diabetes Risk in Primary Care <i>Laura Azzimonti, Marta Lenatti, Marco Zaffalon, Davide Simeone, Aziz Guergachi, Karim Keshavjee, Maurizio Mongelli and Alessia Paglialonga</i>	298

Building an RWD Oncology Data Mart for Diffuse Large B-Cell Lymphoma: From Data Integration to Clinical Insight	303
<i>Laura Antenucci, Edoardo Pompei, Carlotta Masciocchi, Stefano Patarnello, Elena Maiolo, Fabrizia Campana and Stefan Hohaus</i>	
Harnessing Clinical Data Streams for Nursing Workload Prediction Using Artificial Intelligence	308
<i>Lena Frischen and Madlen Fiebig</i>	
Using Large Language Models to Automate the Comparison and Integration of Evolving Clinical Practice Guidelines into Clinical Decision Support Systems	313
<i>Chaïma Abdellaoui, Akram Redjdal and Brigitte Seroussi</i>	
A Knowledge Graph to Represent and Predict Cancer Mechanistic Associations	318
<i>Mehrana Calagari, Samina Abidi and Syed Sibte Raza Abidi</i>	
Headache Diagnosis with Open Language Models on German Vignettes: Study Protocol	323
<i>Dorian Zwanzig, Anika Zahn and Sebastian Strauss</i>	
Secondary Data for Clinical Pharmacists' Decision Support: Evaluating 'Triple Whammy' Interactions Within INTERPOLAR	328
<i>Joachim A. Koeck, Helene Köster, Markus Loeffler, Daniel Neumann, Thomas Ganslandt, Frank Dörje and INTERPOLAR project of the German Medical Informatics Initiative</i>	
Comparing Weight Loss Prior to Pancreatic Cancer Diagnosis in Cases and Controls: A Systematic Review and Meta-Analysis	333
<i>Claire A. Price, Freda Mold, Simon de Lusignan, Nadia A.S. Smith, Martyn Winn and Agnieszka Lemanska</i>	
A Consensus Clustering Approach to Amyotrophic Lateral Sclerosis Phenotyping	338
<i>Pilar M. Ferraro, Sara Narteni, Marta Lenatti, Francesca Oliveri, Chiara Gemelli, Corrado Cabona, Antonio Uccelli, Alessia Paglialonga, Maurizio Mongelli and Angelo Schenone</i>	
Development and Validation of a Multi-Modal Algorithm for Chronic Kidney Disease Detection in a Hospital Clinical Data Warehouse	343
<i>Mathilde Bories, Imane Aoubiza, Morgane Pierre-Jean, Denis Delamarre, Boris Delange, Marc Cuggia and Catherine Duclos</i>	
Artificial Intelligence–Based Prediction of Progression from Gestational Diabetes to Type 2 Diabetes	348
<i>Syeda Rizvi, Mais Alkhateeb, Farida Mohsen, Junaid Qadir, Arfan Ahmed and Alaa Abd-Alrazaq</i>	
Federated Propensity Score Matching for Bias Correction in ICU	353
<i>Syedmostafa Sheikhalishahi, Johanna Schwinn, Matthaeus Morhart, Ludwig Christian Hinske and Mathias Kaspar</i>	
Machine Learning Applications Within the Earlier Medicine Framework for Stroke: A Scoping Review	358
<i>Ika Agustin Atika Putri, Annisa Ristya Rahmanti, Guardian Yoki Sanjaya, Hanifah Wulandari, Lutfan Lazuardi and Huan X. Nguyen</i>	

Machine Learning for Cardiovascular Prevention Prescriptions: Real-World vs. Synthetic Data	363
<i>Alaedine Benani, Damien Grosgeorge, Pierre Bauvin, Stéphane Ohayon, Sylvain Bodard, Emmanuel Messas and Xavier Tannier</i>	
Clinical Diagnosis of Rare Diseases Using Leaky Noisy-OR Bayesian Networks	368
<i>François Roucoux and Sébastien Jodogne</i>	
Integrating Causal Inference and Agent-Based Modelling to Assess the Impact of Clinicians' Guideline Adherence in Older Adults Hospitalized with Pneumonia	373
<i>Fabrizio Pecoraro and Mattia Proserpi</i>	
An Explainable, Knowledge-Driven System for Difficult Airway Risk Stratification and Planning	378
<i>Akram Redjda, Adrien Ugon, Fahira Abdoulaime, Lehna Bouchama', Antoine Ritz, Eve Bensoussan, Nolan Lestoclet-Yansens, Julien Bordes and Salah Boussem</i>	
Multimodal Graph-Based Model for Discrete-Time Survival Prediction in Liver Cancer	383
<i>Hafsa Akebli, Vincenzo Della Mea and Kevin Roitero</i>	
Evaluating the Potential of Machine Learning for Discharge Management on Routine Health Insurance Data	388
<i>Zully Ritter, Miriam Cindy Maurer, Jacqueline Michelle Metsch, Lisa Weller, Thorsten Pollmann, Mathias Kretzler, Thomas Grobe and Anne-Christin Hauschild</i>	
Design and Evaluation of an Episodic Guideline-Driven Decision Support Engine	393
<i>Bruria Ben Shazar, Yuval Shazar, Shai Jaffe, Odeya Cohen, Erez Shalom, Maya Selivanova, Ephraim Rimon, Irit Hochberg and Ayelet Goldstein</i>	
Identification of Cervical Cancer Biomarkers Using Gene Co-Expression Networks and Machine Learning Methods	398
<i>Praveen Kumar Govarthan, Jac Fredo Agastinose Ronickom and Ramakrishnan Swaminathan</i>	
Neurologists' Expectations of AI in Clinical Practice: A Study on Task Prioritisation and Patient-Centred Perspectives	403
<i>Tuuli Turja, Hanna Kuusisto and Virpi Jylhä</i>	
Machine Learning Models for Predicting Mortality Risk and Survival Time in Lung Cancer Patients Treated with EGFR-TKIs	408
<i>Van Thuan Nguyen, Ngoc Hoang Le, Nhu Quynh Phan, Chiehfeng Chen, Chien-Tien Su and Phung Anh Nguyen</i>	
GlobalMedQA: A Standardized Multilingual Dataset for Assessing Medical Knowledge in LLMs	413
<i>Mário Macedo, Manuel Hecht, Sylvia Saalfeld, Björn Schreiweis and Hannes Ulrich</i>	
Provider-Related Determinants Influencing Drug-Drug Interaction Alert Handling in the Electronic Health Record	418
<i>Kimmy Raven, Stephanie Medlock, Linda W. Peute and Iacopo Vagliano</i>	

Machine Learning Prediction of Growth Hormone Response in Children Non-Growth Hormone-Deficient Short Stature	423
<i>Simone Rancati, Pietro Bosoni, Giulia Mirra, Annalisa Deodati, Lucia Sacchi, Chiara Toffanin and Riccardo Bellazzi</i>	
Designing an Interoperable Intelligent Agent for the Blood Transfusion Chain in Geneva, Switzerland	428
<i>Rami Albadri, Ivana Perelli, François Freitas, Sophie Waldvogel and David-Zacharie Issom</i>	
Knowledge-Based Interpretation of Multi-Modal Clinical Findings: Evaluating a Local Agentic Bridge Between Worlds	433
<i>Leonhard Hauptfeld, Moritz Grob, Julia Liepold, Andrea Rappelsberger and Klaus-Peter Adlassnig</i>	
Physics-Informed Digital Twin of Maternal–Fetal Hemodynamics for Predictive Risk Simulation in Preeclampsia	438
<i>Elena Silvia Bernad, Lăcrămioara Stoicu-Tivadar, Mihaela Crişan-Vida and Brenda Cristiana Bernad</i>	
Explainable Framework for Ontology-Based Similarity: A Use Case on SNOMED CT	443
<i>Alexis Baudin, Christophe Gaudet-Blavignac, Christian Lovis and Mina Bjelogrić</i>	
Challenges Faced by People with Depression Using AI Chatbots in Saudi Arabia	448
<i>Sara Alrashed, Peter A. Bath and Kushwanth Koya</i>	
Detecting Contraindications in Routinely Collected Healthcare Data to Emulate Decision Support for Medication Reviews Within the INTERPOLAR Study	453
<i>Florian Schmidt, Alexander Struebing, Helene Koester, Tatjana Beppler, Sebastian Staebert, Markus Loeffler and Daniel Neumann</i>	
Automated Detection of Tuberculosis on Chest X-Rays Using Artificial Intelligence	458
<i>Lydie Simone Tapsoba, Moumouni Djibo and Relwendé Aristide Yameogo</i>	
Development and Evaluation of a Simple Prognostic Score to Predict Mortality in Patients Hospitalized for Heatstroke in a Resource-Limited Setting	463
<i>Yves M.K. Kantagba, David Lankoande, Seydou G. Barro, Serge L.W. Nikiema and Pascal Staccini</i>	
Semi-Automating Curation of Clinical Practice Guidelines	468
<i>Elia Lima-Walton, Harsh Sindhwa, Hina Nazir, Nisha Manandhar and Ritvik Khandelwal</i>	
Random Forest Model for the Prediction of Herbal-Induced Liver Injury: Application to Molecules from the West African Pharmacopoeia	473
<i>Yves M.K. Kantagba, Seydou Golo Barro, Serge L.W. Nikiema and Pascal Staccini</i>	
AI-Based Prediction of Clinical Deterioration in Hospitalised Cardiac Patients	478
<i>Kean Lee Kang, Victoria Blake, Heidi Welberry, Oisín Fitzgerald, Jonathan Greenberg, Sze-Yuan Ooi and Blanca Gallego</i>	

Temporal Reasoning for Clinical Guidelines: An Organizational Perspective <i>Andrea Terenziani</i>	480
Mapping Nursing Workflows for Digital Innovation: Field Observations & Co-Creation in Austrian Care Settings <i>Katharina Lichtenegger, Mirna Ban, Eva Zöbinger, Denise Wilfling, Philip Stampfer, Renate Nantschev and Angela Libiseller</i>	482
What Is My Data Capable of? Using Performance Limits to Assess Data Quality <i>Johanna Schwinn, Seyedmostafa Sheikhalishahi, Matthaëus Morhart, Iñaki Soto-Rey, Ludwig Christian Hinske and Mathias Kaspar</i>	484
Multimodal Cardiovascular Disease Detection Using ECG Image and EHR <i>Dongyang Liu, Guodao Zhang, Winfried Post, Michael Dahlweid and Hong Sun</i>	486
Automatic Placement Within a Hierarchical Clinical Decision Support Terminology <i>Skyler Resendez, Frank LeHouillier, Guresh Mehta, Diane Montella, Jonathan Nebeker, Andrew Holdaway, Steven H. Brown and Peter L. Elkin</i>	488
Using Routine Data for Automatic Early Detection of Delirium – An Algorithm Proposal <i>Anja Blume and Lena Frischen</i>	490
Federated Multi-Agent Architecture for Harmonizing Public Health Datasets into OMOP and FHIR Standards <i>Francisco Lozano, Julia Sánchez Esquivel, Sergio Paraíso-Medina, Raúl Alonso-Calvo, Paloma Jimeno, Inmaculada Luengo and Victor Maojo</i>	492
A Prediction Model for Cardiovascular Death in Individuals with Prediabetes <i>Amalie K. Andersen, Kristine Færch, Dorte Vistisen, Bernt J. von Scholten, Nils B. Jørgensen, Simon L. Cichosz and Morten H. Jensen</i>	494
Deep Learning-Based Prediction of Pathogenicity for ABL1 Protein Variants Using Sequence Representation <i>Gülbahar Merve Şilbir and Burçin Kurt</i>	496
Invalid Action Masking in Emergency Patient Scheduling <i>Semih Sirin, Thenuja Thirunavukkarasu, Lukas Tetz, Dirk Roos and Hubert Otten</i>	498
Predicting Pediatric Mortality Across Five Intensive Care Units: Toward an Early Warning Using Machine Learning <i>Kseniia Sholokhova, Yu-Chuan Li, Chih-Wei Huang and Hsuan-Chia Yang</i>	500
Generalization of ML Models Between ECG and VCG Representation <i>Lucas Plagwitz, Lucas Bickmann, Julian Varghese, Dominik Heider, Lars Eckardt and Antonius Büscher</i>	502
Assessing AI-Based Decision Support in Early Sepsis and AKI Recognition <i>Natalia Ortmann, Melanie Mergenthaler, Inaki Soto-Rey and Ludwig Christian Hinske</i>	504

Grading Shoulder Osteoarthritis in X-ray Images Using Deep Learning Techniques	506
<i>Thuan Phat Nguyen, Bo-Taek Kim, Ngoc Hoang Le, Seung-Jin Kim, Chang-Hee Baek and Phung-Anh Nguyen</i>	
Modeling the Clinical Reasoning Workflow: A Dynamic, Time-Aware CDSS for the Emergency Department	508
<i>Chaeyeon Park, Sanga Ahn, Hansol Chang, Wonchul Cha and Junsang Yoo</i>	
DeepSeek R1 Distilled Fails to Perform Well Against the USMLE and Other LLMs with and Without Semantics	510
<i>Peter L. Elkin, Guresh Mehta, Aaron N. Elkin, Jonathan R. Nebeker and Steven H. Brown</i>	
OPTIMA-DAW: Improving Cerebral Vasospasm Detection After Aneurysmal Subarachnoid Haemorrhage Using Machine Learning	512
<i>Claire Charamel, Arthur Le Gall, Marc Cuggia and Boris Delange</i>	
Challenges in Using Clinical Data for AI-Enabled Diagnostic Support	514
<i>Mirela Prgomet, Getiye Dejemu Kibret, Judith Thomas, Tze Ping Loh, Kay Weng Choy and Andrea Horvath</i>	
Integrating Nutritional Status in Machine Learning Predictive Models for Cardiovascular Risk: A Pilot Study	516
<i>Suradech Chaitokkia, Nitchara Toontom, Tanunchai Boonnuk, Naruwan Yusamran, Le Ke Nghiep and Kukiat Tudpor</i>	
Risk Alert Mobile Application for Workplace Hazard Reporting	518
<i>Chinnawat Thanchaiying, Laksamon Phaksai, Niratchaporn Phadungsin, Preeyanut Wongseeda, Wipa Chuppawa, Le Ke Nghiep and Kukiat Tudpor</i>	
AI-Integrated EEG Decision Support for Neurocritical Care: A Conceptual and Feasibility Framework	520
<i>Sari Rahmawati Kusuma Dewi, Hsuan-Chia Yang, Chih-Wei Huang, Yu-Chuan (Jack) Li and Ming-Chin Lin</i>	
Reconceptualizing Participation in the ICF: A Formal Ontology-Based Approach	522
<i>Esteban Guerrero, Christine Imms, Mats Granlund, Helena Lindgren and Vera C. Kaelin</i>	
An Event-Condition-Action (ECA)-Based Formalization of Clinical Guidelines	524
<i>Marcel Ebbinghaus, Bora Gashi and Martin Boeker</i>	
Development of A Wearable Device for Fall Monitoring: A Preliminary Study	526
<i>Supitchapong Tanakietpinyo, Le Ke Nghiep, Anuwat Khotprom and Kukiat Tudpor</i>	
<b>Section 3. Ethics, Explainable and Trustworthy Artificial Intelligence</b>	
Architecture-Specific Impact of Preprocessing on Machine Learning Models for ECG Classification	529
<i>Lucas Bickmann, Lucas Plagwitz, Antonius Büscher and Julian Varghese</i>	

System Architecture of a Local Hybrid AI for Secure Patient Communication: Implementation on Consumer Hardware	534
<i>Motoki Sato, Yuki Matsushita, Hidekazu Takahashi, Tomoaki Kakazu, Sou Nagata, Mizuho Ohnuma, Atsushi Yoshikawa and Masayuki Yamamura</i>	
Biases in Healthcare AI and Their Impact on Patient Empowerment: A Scoping Review	539
<i>Lisa-Maria Norz and Elske Ammenwerth</i>	
Moral MedTech: Exploring Ethics-by-Design for Artificial Intelligence in Healthcare via Serious Gaming	544
<i>Danielle Sent, Mirjam de Haas, Rijk Mercur and Ildikó Vajda</i>	
<i>Keep it Simple, Stupid!</i> Towards PySTRIPA for Medication Reviews	549
<i>Marco Spruit</i>	
Limits of Generative Pre-Training in Structured EMR Trajectories with Irregular Sampling	554
<i>Nicholas I-Hsien Kuo, Blanca Gallego and Louisa R. Jorm</i>	
Evaluation of Graph-Based Algorithms for Early Detection of In-Hospital Mortality	559
<i>Paul-Antoine Beaudoin, Christophe Cance, Sophie Achard, Jean-Luc Bosson and Alexandre Moreau-Gaudry</i>	
Designing a Multimodal Data Structure for Cognitive Decline Using All of Us Resources and Gemini Flash Thinking	564
<i>Oliwia Kudyba and Ankica Babic</i>	
Guideline-Aligned Machine Learning for Predicting Ondansetron Administration at the End of Anaesthesia: Explainable Decision Support for PONV Prophylaxis	570
<i>Tom Strube, Leonie Weltermann, Jonas Weber and Jérôme Defosse</i>	
Ethical Implications of Small Language Models (SLMs) in Healthcare Applications	575
<i>Kerstin Denecke, Jacopo Vagliano, Lantana Hewitt, Abdel-Karim Al-Tamimi, Stéphane Meystre and Douglas Teodoro</i>	
Improving Explainability in Clinical Mortality Prediction Using Stacking Classifiers over Annotated Clinical Notes	580
<i>Virgile Barthet, Emmanuel Morin and Pierre Zweigenbaum</i>	
Explainable Machine Learning for Parkinson's Disease Screening Using Spiral Drawing Test	585
<i>Manlu He, Aarnout Brombacher and Danielle Sent</i>	
National Collaboration on AI Deployment in Norway	590
<i>Gro-Hilde Severinsen and Line Silsand</i>	
Logic Models on Health Information Technology: First Insights from a Cross-Disciplinary Scoping Review	595
<i>Elske Ammenwerth, Michelle Bindel and Iris Hörhammer</i>	
A Durable Backdoor Attack on Medical Imaging via Federated Learning	600
<i>Hichem Faraoun, Reda Bellaqfira, Gouenou Coatrieux and Kassem Kallas</i>	

Hybrid AI Decision Support in Healthcare: Insights into Usability and Trust <i>Olivier Blanson Henkemans, Bodhi Allard and Liesbeth van den Berg</i>	605
Advancing Knowledge in Evaluating the Clinical Impact of Large Language Models for Clinical Text Summarization: A Narrative Review <i>Lydie Bednarczyk, Mina Bjelogrić, Jamil Zagher, Maria Tcherepanova, Julien Ehram, Adel Bensahla, Christian Lovis and Christophe Gaudet-Blavignac</i>	610
Automating Safety Surveillance for Software-Based Medical Devices: Insights from FDA MAUDE Data <i>Rohit Kesharwani, Lana Cvijic and Kerstin Denecke</i>	615
Exploring User Trust and Adoption of AI Chatbots for Health and Fitness Management Across Age Groups <i>Khadija Baffa and Elisavet Andrikopoulou</i>	620
Harnessing Pattern Recognition Techniques for Data Quality Detection <i>A. Rosemary Tate</i>	625
Conflicting Logics in EHR-AI Integration: Human Factors and Sociotechnical Tensions in Clinical Work <i>Michael R. Cauley and Richard J. Boland Jr.</i>	630
Qualifying Missingness in Real-World Clinical Data for Secondary Use <i>Pauline Fracasso, Morgane Pierre-Jean, Gouenou Coatrieux, Marc Cuggia and Sandie Cabon</i>	635
Determinants of the Acceptance of Health-Related Use of Artificial Intelligence in the General Population: A Cross-Sectional Study <i>Mariusz Duplaga</i>	640
From Principles to Action: A French Framework for Operationalizing Ethics in Health AI <i>Brigitte Seroussi</i>	645
Participatory Assessment of Ethics in AI: A Review <i>María Zamora-Lorence, Jorge Roperó and Octavio Rivera-Romero</i>	650
Toward an Ethical Framework for Patient-Facing Artificial Intelligence in Clinical Settings <i>Meghan Reading Turchioe, Pooja Desai, Zayan Reza and Natalie Benda</i>	655
Experts' Perception of AI-Generated Personalised Stories for Health Promotion <i>Jayalakshmi Baskar, Vera C. Kaelin and Helena Lindgren</i>	660
Identifying Clinical Predictors of Diabetes and Prediabetes: An Explainable AI Approach Using Primary Care Electronic Medical Records <i>Giulia Carpani, Marta Lenatti, Davide Simeone, Aziz Guergachi, Karim Keshavjee and Alessia Paglialonga</i>	665
A Hybrid Delphi-Inspired Expert-LLM Workflow for Efficient Evidence Screening in Systematic Reviews <i>Omid Pournik, Emma Watts, Emma Richards, Kristien Boelaert, Neil Sharma, Saadullah Farooq Abbasi, Xuefei Ding, Leila Ghalichi and Theodoros N. Arvanitis</i>	670

Mapping Existing Evidence on Physicians' and Patients' Experiences with GenAI in Clinical Communication and Documentation: A Rapid Review <i>Carolina Garcia Sanchez, Anna Kharko, Maria Hägglund, Sara Riggare and Charlotte Blease</i>	675
Integrating AI Scribe Technology into Public Health Workflows: Simulation and Field Evaluation in Disease Case Management <i>Nauman Shakeel, Natalie Riewe, Steven Rebellato, Casey Hirschfeld, Ravi Shah, Michael Whyte, Edson Kenzo Takei, Raushan Baisalov and Helen Chen</i>	680
Membership Inference or Data Split Bias? Identifying False Positives in Synthetic Medical Image Privacy Audits <i>Linxue Bai, Omid Pournik, Xuefei Ding, Saadullah Farooq Abbasi, Le Zhang and Theodoros Arvanitis</i>	685
How AI Agreement Shapes Confidence: Evidence Across Clinical Skill Levels <i>Federico Cabitza and Alessia Papale</i>	690
Learning Health System: Experiences in Accessing and Curating Complex Routine Data from a Hospital Group to Improve Implant Surgery Outcomes <i>Jörg Hassmann, Saskia Kröner, Jonas Hammer, Mareike Przyssucha, Martin Stache, Frank Teuteberg and Ursula Hübner</i>	695
Med-KAG: Preliminary Results of a Medical Knowledge-Augmented Generation Approach <i>Edouard Haddag, Gabriel H.A. Medeiros and Lina F. Soualmia</i>	700
Artificial Intelligence: The Use and Application by Brazilian Healthcare Professionals <i>Luciana Portilho and Heimar F. Marin</i>	705
Building Relationships: A Scoping Review of Empathy in Human-Robot Interaction <i>Andre W. Kushniruk, Seper Rohani and Elizabeth M. Borycki</i>	710
PROSODIC: Predictive Intelligence for Secondary Prevention of Youth Suicide <i>María González López, María Luisa Barrigón Estévez, Miguel Ruiz-Veguilla, Esther Román-Villarán and Alberto García-Blanco</i>	715
Expert Evaluation of an AI Governance and Ethics Framework Implemented at a University Hospital <i>Timo Apfelbacher, Maria Christoforaki, Shura-Roman Stump, Maja Ullrich, Elmar Kotter, Hans-Ulrich Prokosch and Thomas Ganslandt</i>	720
Advances and Trends in Clinical Information Systems: From AI to Machine Learning Applications and Beyond <i>Elizabeth M. Borycki, Hrishikesh S. Nair and Andre W. Kushniruk</i>	725
Exploring Healthcare Providers' Expectations and Perceptions of AI Machine Learning Decision Tree Models in Healthcare <i>Bas Luka Hendrik Laan, Linda Peute and Divya Srivastava</i>	730

Exploring the Personalisation of Digital Cognitive Rehabilitation in Multiple Sclerosis Through Wearable Data and Machine Learning	735
<i>Georgios Nomikos, Antonios Billis, Alexandra Anagnostopoulou, Alexandros Moraitopoulos, Georgios Petridis, Maria Karagianni, Nefeli Tsoukaki, Ioannis Nikolaidis, Athanasia Liozidou, Nikolaos Grigoriadis, Panagiotis D. Bamidis and Charis Styliadis</i>	
A Zoo of AI Transparency Indicators: What Do Users Want (and Need) in Hospitals?	740
<i>Mina Bjelogrljic, Inês E. Amaro, Laëtitia Gosetto, Hugues Turbe, Julie Guebey, Christian Lovis and Christophe Gaudet-Blavignac</i>	
A Methodology for Creating Patient Relevant Questions Suitable for Evaluating AI Generated Health Advice	745
<i>Suhani Goyal, Hua-Hsin Tai, Elisabeth Rosen, Suvrat Chandra, Elizabeth Borycki, Andre Kushniruk, Mayce Mansour, Divya Shah and Joseph Kannry</i>	
Making LLM Predictions Interpretable: Fine-Tuning GPT-4o for Early Discontinuation of Cancer Medication	750
<i>Congning Ni, Qingyuan Song, Jeremy L. Warner, Qingxia Chen, Lijun Song, S. Trent Rosenbloom, Autumn Zuckerman, Bridget Lynch, Bradley A. Malin and Zhijun Yin</i>	
Aligning AI-Native 6G Healthcare Systems with EU Ethical and Legal Frameworks	755
<i>Eirini Kanaki, Elisavet Andrikopoulou, Periklis Chatzimisios and Aikaterini Kanta</i>	
Linking Explainability, Trust, and Use: A Framework for Clinical Decision Support	760
<i>Tom Strube, Leoni Weltermann, Jonas Weber and Jérôme Defosse</i>	
Developing a RAG-Based Chatbot for Healthcare: A Case Study of the HeartWise AI Chatbot	762
<i>Riina Peltonen, Manu Setälä and Laura-Maria Peltonen</i>	
Implementing a Semi-Automated Method for Surgical Site Infections Monitoring in a Limited Setting: The SPICMI Method in Martinique University Hospital	764
<i>Sophie Flobinus, Elsa Cecilia-Joseph, Morgane Pierre-Jean, Karine Sanchez, Souad Slimani, Marc Cuggia, Sandrine Julie, Leslie Grammatico-Guillon, Emmanuelle Sylvestre and Orchidée Consortium</i>	
Real-World Application of a Machine Learning Pipeline for Overall Survival in Chronic Lymphocytic Leukemia	766
<i>Christina Papangelou, Thomas Chatzikonstantinou, Persefoni Talimtzis, Anastasia Chatzidimitriou and Evangelia Minga</i>	
Physicians' Perspectives on Predictive Uncertainty in Machine Learning Models	768
<i>Nicolas Frey, Niklas Giesa, Louis Agha-Mir-Salim and Felix Balzer</i>	

Visualization of Clinical Case Similarities in Pediatric Cardiology Using Structured Case Conference Reports	770
<i>Tom Schröder, Darian Liehr, Theodor Uden, Philipp Beerbaum, Oliver J. Bott, Christian Wartena, Michael Marschollek, Steffen Oeltze-Jafra and Volker Ahlers</i>	
Design and Early Evaluation of an Algorithmovigilance System	772
<i>Megan E. Salwei, Sharon Davis, Laurie L. Novak, Colin Walsh, Carrie Reale, Scott Nelson, Susannah Rose and Peter Embi</i>	
High-Stakes AI Feedback in Clinical Assessment: A Comparative Evaluation of GPT-4o and Claude 4 Feedback Fidelity	774
<i>Thomas Kropmans, Oleh Bilokrylyi, Dmytro Predchyshyn, David Cunningham, Edward Melvin and Gabia Neverauskaite</i>	
Traceability in Federated Learning in Healthcare	776
<i>Fu-Sung Kim-Benjamin Tang, Ana Grönke, German Sergei, Mehrshad Jaberansary, Mayra Elwes and Oya Beyan</i>	
Designing for Trust: Exploring User Perceptions of AI Transparency in Healthcare	778
<i>Inês E. Amaro, Mina Bjelogrljic, Julie Guebey, Christophe Gaudet-Blavignac, Christian Lovis and Laetitia Gosetto</i>	
Beyond the Algorithm: Citizens Professionals Dialogue on the Use of Generative AI in Healthcare	780
<i>Isabelle Bos, Marloes Meijer, Sarah van Lierde, Anne Brabers and Kim de Groot</i>	
Governance of Artificial Intelligence in an Academic Health System After 2 Years	784
<i>Lindsey Zimmerman and David A. Dorr</i>	
Reliable Enough? Benchmarking LLMs for Clinical Concept Extraction	786
<i>Johann Pignat, Petros Liakopoulos, Jonatan Bonjour, Phil Cheng, Sokratis Varelogiannis, Christian Lovis, Mina Bjelogrljic, Christophe Gaudet-Blavignac, Michel A. Cuendet and Olivier Michielin</i>	
<b>Section 4. Generative Artificial Intelligence and Natural Language Processing</b>	
Querying Healthcare Data Lake Using LLMs Without Direct Data Exposure: A Feasibility Study	789
<i>Frederic Ehrler, Florian Singer, Deniz Geçer, Julien Houeix and Emmanuel Durand</i>	
Leveraging Large Language Models with Retrieval-Augmented Generation for Semantic Mapping of Clinical Data Lakes to SNOMED CT	794
<i>Frederic Ehrler, Florian Singer, Deniz Geçer, Julien Houeix and Emmanuel Durand</i>	

Development Parameters of the Decision Aid Rule-Based Evaluation and Support Tool (REST) for Optimizing the Resources of an Information Extraction Task	799
<i>Guillaume Bazin, Akram Redjdal, Xavier Tannier, Fanny Adda, Ariel Cohen and Emmanuelle Kempf</i>	
<i>Criquer</i> : A System for Automatic Extraction and Formalization of Eligibility Criteria for Clinical Trials	804
<i>Thomas Ruprecht, Eveline Prochaska and Elisa Henke</i>	
De-Identification of Free-Text Medical Records Using Large Language Models	809
<i>Richard Noll, Maximilian Englisch, Elias Hofmann, Nils Bergmann and Jannik Schaaf</i>	
<i>Unlexi</i> : Developing a Prototype of a Digital Emotion-Focused Therapy Tool for Alexithymia	814
<i>Kanako Tsubaki and Samina Abidi</i>	
Transformer-Based Architecture for Predicting Surgical Complications from EHR Data	819
<i>Eduardo Alonso, Naroa Mendez, Xabier Calle, Alba Garin-Muga, Moisés David Espejo, Maite Lopez, Maykel Alonso-Arce, Eñaut Rojo, Ibai Gurrutxaga and Andoni Beristain</i>	
Measuring the Quality of CDA to FHIR Transformations Using Text Mining Techniques	824
<i>Rainer Randmaa, Igor Bossenko, Gunnar Piho and Peeter Ross</i>	
Impact of LLM Scale and Quantization on Information Extraction from Clinical Text	829
<i>Alban Bornet, Abiram Sandralegar, Anthony Yazdani, Philippe Bijlenga and Douglas Teodoro</i>	
From Report to Record: Prompt-Based Information Extraction from Gynecology Oncology Reports Using LLMs	834
<i>Livia Lilli, Massimo Criscione, Giovanni Paolo Tobia, Federica Tomassini, Chiara Dachena, Alice Luraschi, Andrea Rosati, Anna Fagotti, Massimo Bernaschi and Stefano Patarnello</i>	
Development of a Hybrid Algorithm of Claims Data and EMRs with NLP for Lung Cancer Identification	839
<i>Kento Sugimoto, Shoya Wada, Shozo Konishi, Katsuki Okada and Toshihiro Takeda</i>	
Benchmarking Open-Source Large Language Models in Medical French	844
<i>Maria Tcherepanova, Amandine Quercia, Nikola Bjelogrljic, Lydie Bednarczyk, Jamil Zagher, Christian Lovis, Mina Bjelogrljic and Christophe Gaudet-Blavignac</i>	
Generation of Training Data to Distinguish Adverse Events from Medical Conditions	849
<i>Nour Allam, Paul Biragnet, Marie-Christine Jaulent and Cédric Bousquet</i>	

- Classifying Clinical Evidence Levels of Cancer Variants in Biomedical Literature Using Machine Learning and Large Language Models 854  
*Graziella Credidio, Michael Größler, Benjamin Roth, Alexander Knurr and Layla Tabea Riemann*
- The Limits of Generalization: Zero-Shot French Medical NER Using French, English and Multilingual GLiNER Models 859  
*Jamil Zahir, Christophe Gaudet-Blavignac, Lydie Bednarczyk, Adel Bensahla, Yuanyuan Zheng, Jean-Philippe Goldman, Christian Lovis and Mina Bjelogrić*
- Using Prompt Engineering to Optimize a RAG Pipeline for EHR-Nursing Data Standardization 864  
*Tamara G.R. Macieira, Vedant Upganlawar, Alexander Semenov, Ragnhildur I. Bjarnadottir, Gail Keenan and Yingwei Yao*
- A Real-Time Clinical Text Information Extractor via LLM 869  
*Giovanni Paolo Tobia, Federica Tomassini, Massimo Criscione, Chiara Dachena, Alice Luraschi, Andrea Rosati, Anna Fagotti, Massimo Bernaschi, Stefano Patarnello and Livia Lilli*
- Enhancing Ontology Engineering with Large Language Models: A Stage-Wise Human-in-the-Loop Study 874  
*Xuefei Ding, Omid Pournik, Saadullah Farooq Abbasi, Linxue Bai, Gregory Epiphaniou, Nicholas Matragkas, Stuart Harrison, Carlos Luis Parra-Calderón and Theodoros Arvanitis*
- Evaluating the Role of Order and Time Information for Classifying Sequences of Healthcare Events Derived from Claims Data 879  
*Corentin Faujour, Stéphane Bouee, Corinne Emery and Anne-Sophie Jannot*
- Describing Data Processing in FHIR: AI-Assisted Interoperability for Cancer Stage Extraction 884  
*David Ouagne, Vincent Zossou and Bastien Rance*
- A Two-Stage Pipeline for Linking Clinical Notes to SNOMED CT 889  
*Mihai Horia Popescu, Kevin Roitero and Vincenzo Della Mea*
- Evaluating Open and Accessible Visual Language Models for Optical Character Recognition in Clinical Case Report Forms 894  
*Giovanna Nicora, Marco Germanotta, Irene Giovanna Aprile, Maria Cristina Mauro, Alessio Fasano, Monia Andrea Papa, Riccardo Bellazzi and Silvana Quaglini*
- Generative AI in Dutch General Practice: A Pilot Study of Current Use and Future Perspectives 899  
*A.M.C. Hoyneck van Papendrecht, R.E. Harskamp and H. Pirnejad*
- Explainable Multitask Transformers for Early Detection of Smoking Behaviors and Lung Cancer Symptoms from Danish Electronic Health Records 904  
*Amir Sorayaie Azar, Uffe Kock Wiil, Margrethe Bang Høstgaard Henriksen, Jamshid Bagherzadeh Mohasefi, Ole Hilberg, Amin Naemi and Ali Ebrahimi*

Generative AI in Healthcare Solutions: A Review of Opportunities and Challenges	909
<i>Sio Lai Karppinen and Nirnaya Tripathi</i>	
CACRC-Pan: A Concept Annotated Case Report Corpus and Processing Pipeline for Rare Pancreatic Diseases	914
<i>Christelle Mulimbi, Amaury Fierens, Lucile Dierckx, Sébastien Jodogne and Siegfried Nijssen</i>	
Building a Silver-Standard Dataset from NICE Guidelines for Clinical LLMs	919
<i>Qing Ding, Eric Hua Qing Zhang, Felix Jozsa and Julia Ive</i>	
Extraction of Endoscopic Markers from Clinical Notes in Italian Patients with Autoimmune Atrophic Gastritis Using Small Language Models	924
<i>Laura Bergomi, Tommaso Mario Buonocore, Enea Parimbelli, Marco Vincenzo Lenti, Giovanni Santacroce, Antonio di Sabatino and Daniele Pala</i>	
CONORM-DEID: Robustness Evaluation of a Multilingual De-Identification System for Clinical Texts	929
<i>Anthony Yazdani, Alban Bornet, Hossein Rouhizadeh, Abiram Sandralegar, Philippe Bijlenga and Douglas Teodoro</i>	
OpenExtract: Automated Data Extraction for Systematic Reviews in Health	934
<i>Jim Achterberg, Bram van Dijk, Jing Meng, Saif Ul Islam, Gregory Epiphaniou, Carsten Maple, Xuefei Ding, Theodoros N. Arvanitis, Simon Brouwer, Marcel Haas and Marco Spruit</i>	
Enhancing Explainable AI Stability with Realistic Synthetic Data for Cardiovascular Risk Prediction	939
<i>Chang Sun and Michel Dumontier</i>	
Generating Human-Readable Labels for SNOMED CT Expressions with LLMs: A Study on Model Performance and Rater Subjectivity	944
<i>Adel Bensahla, Jamil Zaghir, Yuanyuan Zheng, Julien Ehrsam, Christian Lovis, Mina Bjelogrljic and Christophe Gaudet-Blavignac</i>	
THERA-IE: An AI-Enabled System for Therapeutic Indication Identification and Extraction from Biomedical Literature	949
<i>Indra Neil Sarkar</i>	
Auto Ontology: Towards Automated Term-to-Concept Assignment in Microbiology Analytics	954
<i>Moritz Grob, Leonhard Hauptfeld, Julia Liepold, Jakob Kainz, Andreas Csarmann, Daniel Rodrigues, Andrea Rappelsberger and Klaus-Peter Adlassnig</i>	
Interpreting ECG Images with Multimodal Large Language Models	959
<i>Keyuan Jiang, Japp Adhikari and Gordon R. Bernard</i>	
Evaluating Large Language Models for Extracting Clinical Recommendations from Practice Guidelines: A Preliminary Study	964
<i>Rose Allington, Nasim Mahmoodi, Omid Pournik and Theodoros N. Arvanitis</i>	

Secure and Enhanced Cyber-Threat Detection in IoMT Using Locally Deployed Large Language Models	969
<i>Saadullah Farooq Abbasi, Muhammad Bilal, Xuefei Ding, Linxue Bai, Omid Pournik, Saif Ul Islam, Gregory Epiphaniou, Carsten Maple and Theodoros N. Arvanitis</i>	
Automated Symptom Identification from Clinical Interview Transcripts in Diagnosed Schizophrenia: A Multi-Agent LLM Framework	974
<i>Puzhen Zhang and Jingzhi Mao</i>	
Build and Query Indexes of Clinical Documents with Easy-to-Reuse Pipelines	979
<i>Félix Berthou, Ghilsain Vaillant, Bastien Rance and Adrien Coulet</i>	
Exploring a Large Language Model-Based Chatbot Use in Data Analysis: A Case Study of the Problems Related to the Do Not Attempt Resuscitation Order	984
<i>Kaija Saranto, Eija Kivekäs and Hanna Kuusisto</i>	
Interpretable Feature Extraction from Clinical Notes for Sepsis Prediction: Comparing Rule-Based, LLM, and Hybrid Approaches	989
<i>Nicolas Frey, Falk Meyer-Eschenbach, Lily Voge, Loreen Ruhm, Jasper Wagnitz, Anatol-Fiete Näher, Elias Grünewald, Johanna Nothacker, Christof von Kalle, Oliver Kumpf and Felix Balzer</i>	
Evidence-Grounded LLM Validation of MIMIC-IV ICD Labels	994
<i>Ahmad Abu Dayeh, Hajira Jabeen and Oya Beyan</i>	
Fine-Grained Mention-Level Analysis of Biomedical Entity Linking Models	999
<i>Baptiste Pras and Nona Naderi</i>	
Advancing Pediatric Rehabilitation Documentation via Neuro-Symbolic AI	1004
<i>Esteban Guerrero, Christine Imms, Mats Granlund, Helena Lindgren and Vera C. Kaelin</i>	
Evaluating a Consumer LLM for Suicide Risk Response Calibration: A Pilot Study	1009
<i>Yesim Keskin, Tricia Park and Selen Bozkurt</i>	
Can NLP Detect Loneliness in Electronic Health Records? A Proof-of-Concept Study	1014
<i>Tricia Park, Sheida Habibi, Jane Lowers, Abeed Sarker and Selen Bozkurt</i>	
How Good Are Patient-Facing LLMs at Survivorship Questions? A Comparative User Evaluation Across Four Chatbots	1019
<i>Saif Khairat, Safoora Masoumi, Hanna Mehraby and John Geracitano</i>	
Evaluating Reasoning Effect for LLMs: Prompt Sensitivity and Text-Image Based Performance in Musculoskeletal Radiology	1024
<i>Eren Çamur, Turay Cesur and Yasin Celal Güneş</i>	
Resource-Conscious Modeling for Next-Day Discharge Prediction Using Clinical Notes	1029
<i>Ha Na Cho, Sairam Sutari, Alexander Lopez, Hansen Bow and Kai Zheng</i>	
LLM4ODM: Synthetic Clinical Study Data Generation for CDISC ODM	1031
<i>Elyas Hussein, Beshr Kaadan, Martin Dugas and Fleur Fritz-Kebede</i>	

Evaluating Large Language Models for Extracting Social Determinants of Health in Substance Use Disorder Notes <i>Mollie Hobensack, Hwayeon Danielle Shin, Anicca Liu, Mingxuan Li, Elizabeth Matthews and Jiyoun Song</i>	1033
Evaluation over Generalist Large Language Models and Specialised Models for Clinical Risk Prediction <i>Zou Lai, Guodao Zhang, Winfried Post, Fried-Michael Dahlweid and Hong Sun</i>	1035
From Discharge Letters to Process Traces with LLMs: A Human-in-the-Loop Pipeline <i>Alessio Bottrighi, Alessandro Canessa, Delfina Ferrandi, Giorgio Leonardi, Antonio Maconi, Costanza Massarino, Stefania Montani, Annalisa Roveta and Manuel Striani</i>	1037
Quantifying Fidelity and Utility in Synthetic Healthcare Data <i>Sina Sadeghi, John Gamisch and Toralf Kirsten</i>	1039
CUI-Curate: A Framework for Automated Clinical Concept Selection from the Unified Medical Language System <i>Victoria Blake, Mathew Miller, Jamie Novak, Sze-Yuan Ooi and Blanca Gallego</i>	1041
Towards a ModernBERT Model Adapted to the Biomedical Domain in Italian <i>Mattia Robbiani, Lorenzo Scarciglia, Veronika Levдик and Stéphane Meystre</i>	1043
Extracting Clinical Recommendations from Oncology Guidelines: An Exploratory Comparison of Automated Approaches <i>Maurice Walny, Sebastian Boie, Stefan Haufe, Felix Balzer and Elias Grünewald</i>	1045
Assessing Clinical Decision-Making Aided by a RAG-Based Dialog in Pre-Examination on Non-Odontogenic Tooth Pain <i>Takashi Yamamoto, Keita Fukuyama, Yukiko Mori, Roberto Espinoza Chamorro and Tomohiro Kuroda</i>	1047
Ontology-Enriched Guidelines Retrieval for Complex Rheumatological Cases <i>Tommaso Mario Buonocore, Sara Marino, Giuseppe Albi, Garifallia Sakellariou, Arianna Dagliati, Enea Parimbelli and Lucia Sacchi</i>	1049
Towards Blended Obesity Care: An LLM-Based Nutrition Coach on FHIR <i>Rebecca Scheel, Thure Georg Weimann and Hannes Schlieter</i>	1051
Transforming Annotated Clinical Narratives into Pruned Interoperable Knowledge Graphs with SNOMED CT <i>Amila Kugic, Markus Kreuzthaler and Stefan Schulz</i>	1054
A Study of Classification Methods for Structural Changes in Japanese Medical Institutions Using Generative AI <i>Mana Araki, Satoshi Mitsuyama and Hitoshi Matsuo</i>	1056

- Integrating Large Language Models into Thematic Analysis Workflows for Healthcare Research 1058  
*Jean Noel Nikiema, Azadeh Bayani, Sana Boudhraa, Guy Paré and Aude Motulsky*
- Uncovering Topics in Dutch Patient Messages in Inflammatory Bowel Disease: A Comparative Study of Embedding Models for Neural Topic Modeling 1060  
*Jiaxu Zhang, Sander Puts, Evelien Hendrix, Arta Aliu, Yomi Okegunna, Dion Wintjens, Zlatan Mujagić, Andre Dekker, Marieke Pierik and Rianne Fijten*
- Combining Anti-Hallucination Strategies for Reliable LLM-Based Clinical Information Extraction 1062  
*Jean Yapo, Chuanming Dong, Marc Cuggia and Boris Delange*
- MINE: An Interactive Platform for Expert-Guided Medical Information Extraction 1064  
*Chuanming Dong, Sandie Cabon, Marc Cuggia and Boris Delange*
- From Unstructured to Structured Nursing Documentation for Myocardial Infarction Patients Using Clinical Practice Guidelines and SNOMED CT 1066  
*Hyeyoung Lee, Sumi Sung, Jungeun Hong, Doyeon Kim, SeungHee Lee and Wooje Sung*
- OMOP Extraction of Medical Text Using LLMs: Preliminary Results 1068  
*Loreen Ruhm, Laura Purfürst, Michael Ahmadi, Jacques Ehret, Maria Rönnefarth, Falk Meyer-Eschenbach, Katharina Schönrath, Stefanie Rudolph, Joachim E. Weber, Christof von Kalle, Johanna Nothacker and Belove Study Group*
- Evaluation of the Construction and Accuracy of a Local LLM Based on Clinical Engineering 1070  
*Kai Ishida*
- Improving Meditron for Medical Coding Through Fine-Tuning: A Comparative Evaluation Against GPT-4 1072  
*Coralie Galland-Decker, Muaziza Ursenbacher, Christophe Nunes, François Bouche, Marie Blanchard, Giorgia Carra, Jean Louis Raisaro and François Bastardot*
- A Federated Benchmark for Clinical Natural Language Processing (FedDRAGON) 1074  
*Bendik S. Abrahamsen, Joeran S. Bosma, Henkjan Huisman and Mattijs Elschot*
- Co-Designing AI-Supported Clinical Documentation for Rehabilitation 1076  
*Frederike Höft, Alexander Klotz-Otto, Jessica J. Ugowe, Esteban Guerrero, Cornelia Zillhardt and Vera C. Kaelin*
- Language Models for Automatic Clinical Coding in Veterinary Texts: Experimental Results 1078  
*Claudio Benzoni, Justin Hofenbitzer and Martin Boeker*

Automated Information Extraction Pipeline for Constructing ED Knowledge Graphs from Korean Clinical Problem Lists <i>Hyeyoon Moon, Eunhye Jang and Won Chul Cha</i>	1080
Towards Clinical NLP in a Low-Resource Language: Structuring Estonian Clinical Text <i>Ken Kruuser, Ahti Lohk, Gunnar Piho and Igor Bossenko</i>	1082
Simplifying Cohort Definition with a Conversational Query Builder <i>Joaquim Vertentes Rosa, Raquel Paradinha, João Rafael Almeida and José Luis Oliveira</i>	1084
Narrative Review of LLMs Benchmarks for French Medical Question Answering <i>Amandine Quercia, Jamil Zagher, Jean-Philippe Goldman, Christian Lovis and Christophe Gaudet-Blavignac</i>	1086
Evaluating Differentially Private Synthetic Data for Multi-Site Clinical Research: A Case Study from 5 Swiss University Hospitals <i>Bayrem Kaabachi, Jeremie Despraz, Jean Regina, Alessandro Mari, David Brüggemann, Paul Rolland, Federico Amato and Jean Louis Raisaro</i>	1088
Voice Diaries as Digital Biomarkers: A Scoping Review <i>Elizabeth Nemeti, Aravind Venkatachalam, Tricia Park, Deanna M. Kaplan and Selen Bozkurt</i>	1090
 <b>Section 5. Standardization, Interoperability, FAIR Data and European Health Data Space</b>	
Good for All, Not Good Enough for One: Reuse Dilemma in Federated Learning <i>Ashkan Pirmani, Yves Moreau and Liesbet M. Peeters</i>	1093
Adapting the Medical Core Data Set Framework for Nursing: A Conceptual Review of the German Medical Informatics Initiative <i>Julia Röglin, Doreen Werner, Lisa Dobbert, Sven Westphal and Franziska Bathelt</i>	1098
Extending Interoperable Emergency Department Data: Standards-Based Design and Evaluation in AKTIN <i>Hauke Heidemeyer, Emily Wedek, Raphael W. Majeed, Kai U. Heitmann, Alexander Kombeiz, Saskia Ehrentreich, Susanne Drynda, Ronny Otto, Wiebke Schirrmeister, Rainer Röhrig and Jonas Bienzeisler</i>	1103
Bridging Gaps in Unified Clinical Terminology: The Necessity of Post-Coordination in SNOMED CT <i>Yuanyuan Zheng, Julien Ehram, Adel Bensahla, Jamil Zagher, Christophe Gaudet-Blavignac, Christian Lovis and Mina Bjelogrljic</i>	1108
From Fragmentation to Transparency: Exploring and Mapping the Landscape of Medical Registries in Germany <i>Anna Niemeyer, Christof Veit, Sebastian C. Semler, Wolfgang Hoffmann, Neeltje van den Berg and Rainer Röhrig</i>	1113

- The European Health Data Space and Data Quality: A Comparison with the IDEFIM Framework for Empirical Health Research 1118  
*Jürgen Stausberg, Sonja Harkener, Christian Draeger, Matthias Löbe and Chris Schubert*
- Structured Chaos: Unintended Consequences of Over-Modeling 1123  
*Christophe Gaudet-Blavignac, Julien Ehram, Adel Bensahla Talet, Mirjam Mattei, Monika Baumann, Jamil Zaghir, Christian Lovis and Mina Bjelogrljic*
- A Systematic Evidence Map of FAIR Compliance in Open-Access Metabolomics Research: Results from a Pilot Study 1128  
*Charlie Harrison, Tulsı Suchak, Kris Elomaa, Reyer Zwiggelaar and Matt Spick*
- Unlocking the Value of Nursing Data: An International Opinion Paper on Missed Opportunities and Policy Imperatives 1133  
*Tamara G.R. Macieira, Gail Keenan, Isabelle Bos and Kim de Groot*
- Development of a Dutch Information Standard for Advance Care Planning 1138  
*Marieke Massa, Lonneke R.E. Vermeulen, Neeltje J. Koning, Esther E. Jellema, Ardon J.R. Toonstra, Carolina A. Heimensen, Jurrian van der Werf and Manon S. Boddaert*
- Detecting Patients with Chronic Kidney Disease Using General Practitioner Electronic Health Records and Electronic Phenotypes 1143  
*Joris E. Lieverse, Izak A.R. Yasrebi-de Kom, Otto R. Maarsingh, Jetty A. Overbeek, Ronald Cornet, Joanna E. Klopowska and LEAP/ROG Consortium*
- Formalizing Obligations for Data Exchange Specifications Like FHIR and HL7 v2 1148  
*Frank Oemig*
- Outcomes from Converting HL7 v2.x Tables to Codesystems and Value Sets (Represented in FHIR) 1153  
*Frank Oemig*
- Pointers to Navigate Between a Graph Database and a Clinical Data Warehouse 1158  
*Julien Ehram, Christophe Gaudet-Blavignac, Cyrille Duret, Adel Bensahla, Lydie Bednarczyk, Christian Lovis and Mina Bjelogrljic*
- Frequency-Based Prioritization of ICD-10-CA/CCI to OMOP Mapping in a Canadian Hospital Data Warehouse: Coverage and Usagi Performance 1163  
*Matisse Decilap, Anya Okhmatovskaia, Jean-Paul R. Soucy, Dave van Steirteghem, Santiago Marquez, Aman Verma, John D. Fletcher and David L. Buckeridge*
- A Regional Data Space for Urgent and Emergency Care in Germany 1167  
*Jonas Bienzeisler, Hauke Heidemeyer, Rainer Roehrig, Alexander Kombeiz, Mohamed Alhaskir, Miriam Hertwig, Jenny Unterkofler, Jörg Brokmann, Ronny Otto, Despina Panagiotidis, Harry H. Beyel, Marco Pegoraro, Viki Peeva, Christopher T. Schwanen, Wil M.P. van der Aalst, Beate Zoch-Lesniak, Ralf Wittmar, Raphael W. Majeed, TRANSPARENT and AKTIN Research Group*

EHDS Data Continuum: A Proposed IHE Integration Profile for Bridging Primary and Secondary Health Data Use <i>Aly Khalifa, Alexander Berler and Rada Hussein</i>	1172
Current Data Collection Efforts in Neuromuscular Disease Research: A Scoping Review <i>Lilli Schuckert, Joost Daams, Ronald Cornet and Martijn G. Kersloot</i>	1177
A Hybrid Pipeline for Mapping French UCD Drug Codes to RxNorm with Dosage Preservation <i>Boris Delange, Mathilde Bories, Sylvain Robert, Arthur Simon, Claire Charamel, Catherine Duclos and Marc Cuggia</i>	1182
GFO-Light: A Simplified Top-Level Ontology — Introduction and Biomedical Case Studies <i>Ralph Schäfermeier, Frank Loebe, Patryk Burek, Christoph Beger, Konrad Höffner, Franz Matthies, Heinrich Herre and Alexandr Uciteli</i>	1187
Five Years of the SPHN RDF Journey: FAIR Enough? <i>Vasundra Touré, Deepak Unni, Harald Witte, Jan Armida and Sabine Österle</i>	1192
Development of a Standardized Interoperability System Between Electronic Health Records and REDCap <i>Amanda Cerón Marcos, Paula Rubio Mayo, Julia Hernández-Pérez, Gustavo Roig Domínguez, M. Elena Hernando, Noelia García Barrio and Juan Luis Cruz Bermúdez</i>	1197
Standardized Information Model for Clinical Texts: The MII Core Data Set Module Document <i>Jakob Faller, Marcel Susky, Noemi Deppenwiese, Justin Hofenbitzer, Christina Lohr, Thomas Ganslandt, Martin Boeker and Frank Meineke</i>	1202
Standardizing ICU Data Across Europe: Development of the INDICATE Minimal Data Dictionary <i>Boris Delange, Mirna El Ghosh, Celia Alvarez-Romero, Maxim Moinat, Paul Hilders, Patrick Rockenschaub, Jan van den Brand, Michel E. van Genderen, Christian Jung, Denis Delamarre, Sylvain Robert, Christel Daniel, Marc Cuggia and Carlos Luis Parra-Calderón</i>	1207
Standardized Annotation of Clinical Narratives with SNOMED CT and FHIR <i>Andrea Riedel, Markus Kreuzthaler and Stefan Schulz</i>	1212
Perspectives Across Data Holders, Tech Enablers, and Research Data Users in Trusted Research Environments <i>Alessandra S. Kuntz, Sophie Wetzig, Linus Weber, Ulrich Sax and Jonas Hügel</i>	1217
Toward Interoperable Variable Definitions: A FHIR-Based Standardization Strategy for the METASTRA Project <i>Serena Moscato, Alberto Marfoggia, Valerio Antonio Arcobelli, Maria Rita Intagliata, Cristiana Griffoni, Giovanni Barbanti-Bròdano, Alessandro Gasbarrini, Antonella Carbonaro and Sabato Mellone</i>	1222

REDCap Ontology Annotation Made Easy (ROME) – A REDCap Module for Simplified Metadata Element Annotation	1227
<i>Christof Meigen, Sophie A.I. Klopfenstein, Andrea Groselj-Strele, Matthias Löbe, Jonathan M. Mang, Dustin Thewes and Günther A. Rezniczek</i>	
Crosswalk Between SNOMED CT and FinCC: Enhancing Semantic Interoperability	1232
<i>Pia Liljamo, Mikko Härkönen and Ulla-Mari Kinnunen</i>	
Meet NUM-ENRICH: A Collaborative National Effort to Extend and Harmonize Research Infrastructures Within the German Network University Medicine	1237
<i>Dagmar Waltemath, Eric Frodl, Gabriele Anton, Oya Beyan, Peter Boor, Andreas Bucher, Julia Dietz, Sabine Hanss, Oliver Kohlbacher, Dagmar Krefting, Torsten Leddig, Rüdiger Pryss, Martin Sedlmayr, Sylvia Thun, Sven Zenker, Sylke Ruth Zeissig and Thomas Ganslandt</i>	
Ontology-Aligned Representation of Adverse Events in a Multiple Myeloma Clinical Trial	1242
<i>Mitra Rocca, Mathias Brochhausen, Michael Buckley and Jonathan P. Bona</i>	
Development and Pilot Evaluation of the Full-Cloud Personal Health Train for Secure Federated Analysis Across Clinical Research Core Hospitals in Japan	1247
<i>Katsuki Okada, Shozo Konishi, Shoya Wada, Kento Sugimoto, Akira Yutani, Kazumasa Kishimoto, Tomohide Iwao, Suzue Terao, Keiichi Nomura, Yoshihiro Aoyagi, Tomohiro Kuroda and Toshihiro Takeda</i>	
Practical Implications for Using Laboratory Data: Research over Federated Networks	1252
<i>David Rubio Ruiz, Aida Muñoz Monjas, Paula Bermejo Bernardo, David Perez-Rey and Matvey B. Palchuk</i>	
Multi-Centric Quality Analysis of Oncological Data in FHIR	1257
<i>Clara Fischer, Christian Gulden, Dorian Quell, Jasmin Ziegler, Dirk Hellwig, Thomas Ganslandt, Tobias Pukrop and Peter Pallaoro</i>	
Data Quality in the ProVal-MS Study: Challenges and Lessons Learned	1262
<i>Peter Pallaoro, Sandra Bilger, Martin Boeker, Markus Budeus, Vera Dehmelt, Marlien Hagedorn, Florian Kohlmayer, Ulrich Mansmann, Sven Olaf Rohr, Benjamin Sailer, Helmut Spengler and Stefan Buchka</i>	
Using the European Electronic Health Record Exchange Format (EEHRxF) from Primary Systems to Public Health Dashboards	1267
<i>Eugenia Rinaldi, Luc Nicolas, Nienke Schutte, Stefano Dalmiani, Eduardo Salgado, Thokozani Reuben Ngidi, Alfredo Sanz, Gloria Cea, Sylvia Thun and Catherine Chronaki</i>	
Connecting Terminology Servers with a Metadata Repository	1272
<i>Larrie Borelle Siabou, Abishaa Vengadeswaran, Dupleix Achille Takoulegba, Tobias Müller, Dennis Kadioglu and Holger Storf</i>	
LinkedDicom: Indexing DICOM Metadata Using Semantic Web Technologies	1277
<i>Johan van Soest, Ananya Choudhury, Alessio Romita, Tim Hendriks, Leonard Wee, Andre Dekker and Varsha Gouthamchand</i>	

Interoperability of Swiss Personalized Health Network RDF Schema with FHIR <i>Deepak Unni, Sophie Anne Inès Klopfenstein, Harald Witte, Thomas Debertshäuser, Thimo Andre Hölter and Sabine Österle</i>	1282
Large Language Models for Health Knowledge Modelling in Data Interoperability: A Scoping Review of Methods, Standards, and Applications <i>Omid Pournik, Saadullah Farooq Abbasi, Xuefei Ding, Nasim Mahmoodi, Rose Allington, Laura Maria Peltonen, Parisis Gallos, Leila Ghalichi and Theodoros N. Arvanitis</i>	1287
DataCastle: A Pragmatic Approach for Research and Real-World Data Management <i>Jori Kern, Markus Katharina Brechtel, Tim Schumacher, Martin Lablans and Tobias Kussel</i>	1292
Interoperability Barriers in the European Health Data Space: A Scoping Review <i>Iiris Karpkala, Manu Setälä and Laura-Maria Peltonen</i>	1297
A FHIR Consent Profile for European Research Biobanks <i>Alessandro Sulis, Cecilia Mascia, Giovanni Delussu, Sara Casati, Matteo Pallocca, Davide Fragnito, Sabato Mellone, Marialuisa Lavitrano, Luca Pireddu and Francesca Frexia</i>	1302
Balancing Personalisation and Interoperability: An Enterprise Architecture Approach to Person-Centred Digital Health <i>Jordi Piera-Jiménez, Michael Rigby, Kathrin Cresswell, Dari Alhuwail and Elisavet Andrikopoulou</i>	1307
FAIRification on Trial? A Provenance and Reproducible Metadata Build Pipeline for Clinical Research <i>Tobechi Obinwanne, Johannes Darms, Juliane Fluck and Ulrich Sax</i>	1312
Designing an Information Model for Structured Referrals and Interoperable Data Exchange in Radiology <i>Laura Palling, Julius Juurmaa, Gunnar Piho and Peeter Ross</i>	1317
From Discoverable to Fit-For-Purpose: Measuring the Impact of Health and Oncology-Specific Metadata Within the Context of the EHDS <i>Kailesh Bansi, Jurrian van der Werf and Matthijs Sloepa</i>	1322
DQ-SR: Towards the Standardization of Data Quality Reports <i>Christian Draeger, Julian Saß, Margaux Gatrio, Christian Henke and Matthias Löbe</i>	1327
Timely, AQL-Driven Clinical Cohort Identification in openEHR Infrastructures <i>Johnson Bankole, Michael Anywar, Jan Heykendorf, Kevin Lütje, Hannes Riemenschneider, Jan Rupp, Peeter Ross and Björn Schreiweis</i>	1332
A User-Centered UX Design Approach for Consenting Secondary Use of Patient Data <i>Patrick Mangesius, Vanessa Feierabend, Nicola Brew-Sam, Thomas Schabetsberger and Klaus Donsa</i>	1337

Embedded Shared EHR in Web Referrals: Early Outcomes from the Yonago City Healthcare Platform	1342
<i>Kei Teramoto, Satoru Sekine, Kosuke Kagamiyama, Chenyu Wu, Hiromi Watanabe, Asako Hirao and Shuji Horiguchi</i>	
Implementing a Governance Framework for Federated Learning	1344
<i>Ana Grönke, Mehrshad Jaberansary, Oussama Zoubia, Susanne Vorhagen and Oya Beyan</i>	
Cross-Institutional Data Harmonization for AI in Nursing Care Using the OMOP CDM	1346
<i>Philip Stampfer, Hendrik Lef, Sai Pavan Kumar Veeranki, Birgit Fürst, Antonia Schelnast, Martina Kroissenbrunner, Elisabeth Mayrhuber, Elske Ammenwerth, Katharina Lichtenegger and Franz Feichtner</i>	
Towards an Integration Engine to Achieve Federated Semantic Interoperability	1348
<i>Rainer Randmaa, Igor Bossenko, Gunnar Piho and Peeter Ross</i>	
Towards a Health Data Knowledge Graph	1350
<i>Jane-Ly Buhvestova, Gunnar Piho, Erki Eessaar and Peeter Ross</i>	
Building Robust Foundations for Data Interoperability in Hematological Malignancies	1352
<i>Evangelia Minga, Christina Papangelou, Thomas Chatzikonstantinou, Eleftheria Katsiri, Evangelos Chandakas and Anastasia Chatzidimitriou</i>	
FEDERA Salud: Early Adoption of SIMPL for Federated Health Data Spaces in Spain	1354
<i>Paloma Bravo-del-Cid, Francisco Rey-Garduño, Maria Gonzalez-Lopez, Silvia Rodriguez-Mejias, Cristian Pulido-Cabello, Francisco Javier Granados-Delgado, Celia Alvarez-Romero, Sandra Leal-Gonzalez and Carlos Luis Parra-Calderón</i>	
Design of a Privacy-Preserving ETL Dataflow for Federated ICU Data Reuse in INDICATE	1356
<i>Maria Parra Rodriguez-Armijo, Celia Alvarez-Romero, Jan van den Brand, Boris Delange and Carlos Luis Parra-Calderón</i>	
Process Mining on FHIR AuditEvents: Conformance Checking with a Standard Operating Procedure for Chest Pain	1358
<i>Natasha Trajkovska, Stefan Kastenhofer, Simone Sandler, Sophie Bauernfeind, Christoph Praschl, Oliver Krauss, Ralf Hecktor, Daniel Herzmanek, Michael Roiss, Michael Haider, Maximilian Rechenmacher and Dominik Roth</i>	
Is SNOMED CT Useful for Identifying Antibiotics Substances in the French Nomenclature of Medicines?	1360
<i>Catherine Duclos, Catherine Letord and Elisabeth Serrot Damatte</i>	
Automating the Integration of Longitudinal Clinical Trial Data Using REDCap	1362
<i>Sowjanya Batchu, Gerrit Burkhardt, Ulrich Mansmann and Marcel Müller</i>	

IMPACT-Data: A Federated Precision Medicine Infrastructure Associated with Science and Technology in Spain	1364
<i>Silvia Rodríguez-Mejías, Fátima Sánchez-Cabo, Fátima Al-Shahrour, Claudia Rosas, M.J. Rementería, Alba Jene-Sanz, Jordi Rambla, Josep Ll. Gelpi, Salvador Capella-Gutierrez, Pablo Ignacio Martínez-Díaz, Joaquín Dopazo, Alfonso Valencia, Carlos Luis Parra-Calderón and Impact-Data Consortium</i>	
Assisting Traceable Coding of Unstructured Text for Secondary Use	1366
<i>Dustin Thewes and Rainer Röhrig</i>	
Efficient Identification of Existing Definitions for Improving Interoperability of Electronic Case Report Forms	1368
<i>Erik Tute, Kristina Scheuermann and Sophie Kruszona</i>	
Development of an Airflow-Based Automated Pipeline for Constructing Common Data Model Integrating Structured and Unstructured Medical Data	1370
<i>Sunah Yang, Kwangsoo Kim and Chang Wook Jeong</i>	
Integrating Multi-Source Biomedical Data for Adverse Drug Reaction Analysis: A Knowledge Graph Approach	1372
<i>Kalliopi Kastampolidou and Pantelis Natsiavas</i>	
<b>Section 6. Information Systems in Healthcare</b>	
Implementing a Secure CI/CD Pipeline for Verifiable Trust in a Federated Health Data Network	1375
<i>Alexander Kombeiz, Emily Wedek, Simon Hüning, Hauke Heidemeyer, Raphael W. Majeed, Rainer Röhrig, Jonas Bienzeisler and Aktin Research Group</i>	
Triangulating Technology Acceptance, Cognitive Load, and Human Factors: A Qualitative Analysis of Nursing Workflows with Multi-Vendor CCIS in PICU	1380
<i>Takeya Takami and Yukie Majima</i>	
ETL Application with R Shiny Visualization	1385
<i>Max Bergmann, Dennis Hübner, Antonia Ewald and Franziska Bathelt</i>	
Data Management in Forensic Medicine: A Proposal for a Layered Architecture Model	1390
<i>Caroline Bönisch</i>	
Development and Validation of a Taxonomy for Use Cases Employing Vital-Sign-Based Biometric User Authentication in Healthcare	1395
<i>Katja Bochtler and Jonas Schropp</i>	
Scaling Electronic Consent for Research Integrated into Clinical Routine Processes	1400
<i>Eric Wündisch, Alexander Palant, Loïc Khodarkovsky, Florian Neumann, Joachim Weber and Fabian Prasser</i>	
The SURROGATOR Framework for Context-Aware Surrogation of Privacy Sensitive Information in Medical Text	1405
<i>Christina Lohr, Marvin Seiferling, Philipp Wiesenbach, Jakob Faller and Christoph Dieterich</i>	

Usability of Digital Health Technologies in the US: Results from a Descriptive National Online Survey of Nurses	1410
<i>Hwayoung Cho, Jiyoun Song, Oliver Nguyen, Tamara Macieira, Raga Bjarnadottir and Dawn Dowding</i>	
Make Open Source Compliant: Validation in Non-Interventional Clinical Studies	1415
<i>Friederike Seyderhelm, Ilka Krepinsky, Sabine Hanss and Jonas Hügel</i>	
Assessing Imaging Metadata Quality in Radiology: Investigating Discrepancies Between PACS and RIS Data	1420
<i>Alexa Iancu, Fatemeh Rahimi, Thomas Ganslandt and Christian Gulden</i>	
Accurate Yet Privacy-Preserving Determination of Case Numbers Across German University Hospital Health Data	1425
<i>Philip Overton, Alexander Kiel, Sebastian C. Semler, Fabian Prasser, Tobias Kussel, Thomas Ganslandt and Julian Gruendner</i>	
Anonymization of Electronic Health Records by the Use of Dimensionality Reduction Techniques	1430
<i>Clarissa Krämer, Louisa Schwarz and Franz Rothlauf</i>	
Transforming Hospital Data into Real-World Evidence for Clinical Research: Insights into a Scalable Framework at Fondazione Policlinico Gemelli Hospital	1435
<i>Laura Antenucci, Chiara Iacomini, Edoardo Pompei, Pierluigi Rogati, Gianluigi Buccomino, Stefano Patarnello, Antonio Marchetti, Giovanni Arcuri, Carlotta Masciocchi and Nicoletta di Giorgi</i>	
Medical Informatics Initiative and the German Portal for Medical Research Data: Alignment with EHDS Regulation	1440
<i>Julian Gruendner, Maximilian Kurscheidt, Philip Overton, Sebastian C. Semler, Hans-Ulrich Prokosch and Thomas Ganslandt</i>	
Trust, Beliefs, and Bias: Understanding Preferences for Consent Procedures for Secondary Use of Health Data	1446
<i>Melissa van Essen, Robert Verheij and Isabelle Bos</i>	
From Data Holder to Intermediary Entity: An Approach for the Evolving Role of Data Integration Centers in the European Health Data Space	1451
<i>Franziska Bathelt, Antonia Ewald, Ines Reinecke, Sven Kleemann and Martin Peuker</i>	
Supporting Risk Assessment Through a Visual, Browser-Based Tool	1456
<i>Christopher Gundler and Frank Ückert</i>	
Dynamic Consent in Personalized Digital Health	1461
<i>Silvia Llorente, Daniel Naro and Jaime Delgado</i>	
Recovering Sensitive Medical Text in Federated Learning	1466
<i>Mohamed El Azzouzi, Reda Bellafqira, Gouenou Coatrieux, Marc Cuggia and Guillaume Bouzille</i>	
Building Scalable and Automated Verification Tools for Healthcare Imaging Systems	1471
<i>Hui Shi, David Woods, Callan Egan and Andy Wilson</i>	

Healthcare Professionals' Concerns About Digital Transformation During Public Health Crises: A Multinational Analysis	1476
<i>Laura-Maria Peltonen, Michelle Honey, Zerina Lokmic-Tomkins, Christoph Golz, Hwayoung Cho, Emma Collins, Tamara G.R. Macieira, Maxim Topaz, Hanna von Gerich and Dawn Dowding</i>	
Blaze: A High-Performance Open Source FHIR Server with Embedded CQL Evaluation Engine	1481
<i>Alexander Kiel, Tobias Kussel, Julian Gruendner, Philip Overton, Thomas Ganslandt and Martin Lablans</i>	
A FHIR-Based Dashboard as an Integrated Research Patient Record and Quality Assurance Tool	1486
<i>Christoph Zilske, Florian Seidel, Jorge Sánchez Cortés, Armin Müller, Peter Brunecker and Fabian Prasser</i>	
Setting up a DataSHIELD Hub for the German Medical Informatics Initiative: Challenges and Lessons Learned	1491
<i>Hammam Abu Attieh, Jasdeep K. Jolly, Peter Pallaoro, Marius de Arruda Botelho Herr, Björn Schreibeis, Toralf Kirsten and Fabian Prasser</i>	
Anonymous Digital Therapy May Increase Help-Seeking Among Stigmatized Individuals	1496
<i>Luke Flanagan, Jana Scheibig, Paula Busch, Hannes Gieseler, Nadine Warnstädt, Nikolai Lenski, Sandra Kostic and Maija Poikela</i>	
Evaluation of Avatarization for Privacy-Preserving Synthetic Health Data Generation: A Case Study in Cancer Prediction	1501
<i>Mohamed El Azzouzi, Reda Bellafqira, Gouenou Coatrieux, Marc Cuggia and Guillaume Bouzille</i>	
DicomShield: A Pseudonymization Proxy for the Secondary Use of Imaging Data in the Research Context	1506
<i>Johannes Benedict Oehm, Lucas Bickmann, Alexander Brenner, Michael Storck, Dominik Heider, Julian Varghese and Tobias J. Brix</i>	
Developing a Guideline for IT Outage Management in Hospitals: A Practice-Oriented Approach	1511
<i>Annika Hering, Christof Seggewies, Franziska Jahn and Jan-David Liebe</i>	
Breaking the Silo: Operationalizing Trust in the European Health Data Space	1516
<i>Evangelos Markatos and Catherine Chronaki</i>	
Towards FAIR Clinical Registries: A Privacy-by-Design Framework for Migrating Legacy Document-Based Clinical Reports to REDCap	1521
<i>Jeeva Sam, Romina Blasini, Patrick Janetzko, Khodr Tello, Werner Seeger and Raphael W. Majeed</i>	
The Somnolink-Hub: A Central Infrastructure That Unites Sleep Data at Point of Care	1526
<i>Philip Zschke, Friederike Seyderhelm, Cynthia S. Schmidt, Adrian Capraru, Gregor Thiem, Philipp Wieder, Christoph Schöbel and Dagmar Krefting</i>	

Annotation-Driven Middleware for Laboratory Data Exchange: Building Federated and Equitable Health Information Systems <i>Sankatha Bamunuge, Tia Haddad, Souheil Khaddaj, Simon de Lusignan and Pushpa Kumarapeli</i>	1531
Federated Deception Intelligence and the ASKOS Solution for Cyber-Resilient Healthcare Infrastructures <i>Olympia Giannakopoulou, Marilena Tarousi, Thelma Androutsou, Stavros Pitoglou, Emmanouil Skoularikis, Dimitrios Pliatsios, Panagiotis Sarigiannidis and Dimitris Koutsouris</i>	1536
Healthcare Professionals' Perspectives on Technology in Transitional Care: Insights from Greece <i>D. Petsani, K. Tsimpita, E. Kehayia, P. Bamidis and E. Konstantinidis</i>	1541
Implementing an Open Source Hospital Information System: Lessons from the OpenClinic GA Pilot in Burkina Faso <i>Enoch Bidima, Bry Sylla, Iréné Bamogo, Boureima Bance, Emmanuel Zerbo, Fonk Zouri, Abdoul Karim Ouattara, François Nikiema and Jean Serge Dimitri Ouattara</i>	1546
Time to Care-AI Supported Nursing Documentation <i>Lene Baagøe Laukvik, Taridzo Chomutare, Miguel Angel Tejedor and Mariann Fossum</i>	1551
Digital Health Adoption in Laboratory Services in Libya: Patient and Staff Perspectives Using an Extended UTAUT Framework <i>Haythem Nakkas, Val Adamescu, Abdul Rehman Gilal and Maryam Binabdullah</i>	1556
Navigating the “Valley of Death”: An Open-Source, Modular Framework for Generative AI in Healthcare <i>Bell Raj Eapen and Neetu Singh</i>	1561
Driving Assurance and Quality Improvement Using AMaT: A Case Study of the Ward and Area Module at Swansea Bay University Health Board (SBUHB) <i>Francesca Holt and Lucia Simona Ferraraccio</i>	1563
From Guidelines to Practice: Regionalising Oncological Patient Pathways <i>Carola Martin, Hannes Schlieter and Johanna Kirchberg</i>	1565
A GDPR-Aligned Infrastructure Enabling Secure Multicenter Research Studies <i>Serena Moscato, Cleiston Rodrigues Da Silva, Antonino Amedeo La Mattina, Valerio Antonio Arcobelli and Sabato Mellone</i>	1567
Data Warehouse to Support Clinical Trials in Dentistry <i>Alessandra Introvaia, Noemi Giordano, Samanta Rosati, Silvia Cannone, Giacomo Baima, Federica Romano, Mario Aimetti and Gabriella Balestra</i>	1569
On the Ethical Aspect of Artificial Intelligence-Based Decision Process for Transplantation <i>Lisiane Pruinelli, My Thai and Pierangelo Veltri</i>	1571

- Real-Time Anonymization and Data Minimization of Vital Signs for Clinical Decision Support Systems and Analytics 1573  
*Elias Grünewald, Louis Loechel and Felix Balzer*
- Integration and Harmonization of Multi-Source Obstetric Data Using Rule-Based NLP for Fetomaternal Risk Modelling 1575  
*Jon Barrenetxea, Elias Grünewald, Barbara Tabernig, Julia Sommer, René Schmiedler, Louisa Sommer, Ingrid Sonnabend, Christiana Ernst, Florian Recker, Silke Wegener and Felix Balzer*
- Leveraging Distributed Ledger Technology for Patient Opt-Out Management in the Context of the European Health Data Space 1577  
*Syed Abrar Ahmed, Ricardo Correia Bezerra, Simon Lewerenz and Henrique Martins*
- From Excel to Automation: The Transplant Mapper for Interoperable Transplant Data Management 1579  
*Marcel Müller, Kurt Kruber, Ulrich Mansmann and Markus Guba*
- PreNUDGE: A Platform Ecosystem for Digital Prevention 1581  
*Stefan Hochwarter, Philip Stampfer, Thomas Truskaller and Franz Feichtner*
- Bridging Routine Data and Clinical Research: A Structured Approach to Data Preprocessing 1583  
*Matthias Katzensteiner, Darian Liehr and Oliver J. Bott*
- A Web3-Based Patient-Centric Health Data Management System 1585  
*Dongjae Shin, Minseon Park and Hyung-Jin Yoon*
- From Evidence to Implementation: Logic Modelling for Digital Nursing Innovation 1587  
*Elske Ammenwerth, Stefan Hochwarter, Mirna Ban, Angela Libiseller and Katharina Lichtenegger*
- Enabling Privacy-Preserving Federated Learning in Healthcare: The FLAME Architecture and Policy Framework 1589  
*Marius de Arruda Botelho Herr, Peter Placzek, Hammam Abu Attieh, Bruce Schultz, David Hieber, Alexander Röhl, Mehrshad Jaberansary, Alexander Twrdik, Paul Brassel, Max Schaible, Mehmed Halilovic, Fabian Prasser, Toralf Kirsten and Oliver Kohlbacher*
- Cooperation Map: Visualizing and Analyzing Patient Transfers and Referrals 1591  
*Xenia Hautmann, Christoph Wengenmayr, Natalia Ortmann, Dorian Quell, Alessandra Hollmann and Ludwig Hinske*
- A Maturity Model for the Enforcement of PETs in Federated Settings 1593  
*Hammam Abu Attieh, Mehmed Halilovic, Marius de Arruda Botelho Herr, David Hieber, Peter Placzek, Alexander Roehl, Jonas Kuntzer, Alexander Ziller, Oliver Kohlbacher, Daniel Rueckert and Fabian Prasser*
- Proposed Requirements for Clinical Trial Management Systems in Digital Therapeutics Trials 1595  
*Moses Yook, Soo Kyung Yoon, Dai Jin Kim and In Young Choi*

- Exploring Documentation Burden and the Use of Artificial Intelligence Among Swiss Rehabilitation Professionals 1597  
*Edona Rexha, Ruth Hersche, Roxanne Maritz, Carla Sabariego and Vera C. Kaelin*
- A Web Application for Structured Management and Reuse of Electronic Case Report Forms in REDCap 1599  
*Daniel Birthelmer, Frank Kramer and Florian Auer*
- HeXEHRs: Design and Implementation of a FHIR-Based Cloud EHR and Client for Depopulated Regions with AI and Digital-Twin Integration 1601  
*Tomohiro Sawa, Ryota Sakurai and Kazuhiko Ohe*
- Reduction in Nursing Overtime Through Application of Process Pathways to All Inpatients and Monitoring of Immediate Data Entry Rates 1603  
*Satoko Tsuru, Tetsuro Tamamoto, Akihiro Nakao, Tatsunori Hara, Seiichi Yasui, Chitose Watanabe, Yoko Maehara, Chikako Yuno and Yoriko Jutori*
- From Clinical Laboratory Results to REDCap: An Automated Workflow for Longitudinal CAR-T Research Data 1605  
*Samar Shamas, Ulrich Mansmann, Linus Kruk, Kayleen Shi, Tobias Tix, Marcel Müller and Kai Rejeski*
- A Risk Analysis Tool for Medical Studies 1607  
*Alexandre Cotorobai, Raquel Paradinha, Jorge M. Silva, João R. Almeida and José L. Oliveira*
- Nationwide Digital Integrated Care Plan for Coordinated Health and Social Services – An Estonian Example 1609  
*Anna Dudkina, Kadi Lubi, Katrin Gross-Paju, Therese Scott Duncan and Peeter Ross*
- Exploring Virtual Healthcare Scenarios Through Model-Driven Healthcare Engineering 1611  
*Elena Enamorado Diaz, Julián A. García-García, María José Escalona and Jörg Thomaschewski*
- Section 7. Personalized Medicine**
- A Mobile Research App for Post-COVID Fatigue Monitoring 1614  
*Marcel Weber, Ann-Kathrin Knak and Antje Wulff*
- The Future of Digital Interventions in Epilepsy Care: Needs, Scenarios, and Possibilities 1619  
*Manria Sinervä, Tanja Vihriälä-Määttä, Aida Mikkola, Pantea Keikhosrokiani, Lakshmi Mampatta, Anthony Korsah, Olli Korhonen, Sehrish Khan, Woubshet Behutiye and Minna Isomursu*
- Impact of Digital Platform Engagement by Healthcare Professionals on Patient Adherence to Recombinant Human Growth Hormone Therapy 1624  
*Paula van Dommelen, Lilian Arnaud, Antonio de Arriba, Ekaterina Koledova, Maria Lourdes Crespo and Ignacio Bergadá*

- Empowering Citizen Participation in Digital Health: Requirements for Effective e-Participation Platforms 1629  
*Vera Weirauch, Melissa Knoll and Sven Meister*
- Leveraging Synthetic Patient Data for Process Mining in Healthcare 1634  
*Selina Adlberger, Sophie Bauernfeind, Mitch van den Broek, Andreas Pointner, Klaus Arthofer and Oliver Krauss*
- Toward Clinical Digital Twins: A Three-Dimensional Framework for Knowledge Extraction, Pathway Modeling, and Visualization Using MIMIC-IV Data 1639  
*Ankica Babic, William Røise, Carl Oskar Kraft Sahlgaard and Ida Wergeland Sævareid*
- Design of an Interoperability Architecture for STAGE Person-Centred Applications for Clinicians and Ageing Citizens 1644  
*Gokce Banu Laleci Erturkmen, Bunyamin Sarigul, Mustafa Yuksel, Maria Bulgheroni, Michele Atzeni, Laura Headley, Marina Camacho, Carlos Martin-Isla, Birgit Linkohr, Erika Jarva and Sylvain Sebert*
- Enhancing Patient Services Through Digital Appointment Management: Evidence from Dedalus Swiftqueue 1649  
*Mobin Yasini, Brendan Casey, Dennis Rausch, James Neal, Poopak Sadeghi, Laurence Musker, Elmaz Korimbocus and Michael Dahlweid*
- Using Human-Centered Design to Build a Peer-Support Network for People Living with Chronic Diseases 1654  
*Mikael Scholich, Sandrine Jonniaux, Stéphane Santini, Zoltan Pataky, Olivier Michielin and Frédéric Ehrler*
- Modelling and Implementation of a Precision-Oncology Data-Integration Platform for Real-World Molecular Tumor Board Decision-Making 1659  
*Julia Hernández-Pérez, Ángel Martínez-González, Sandra Cruz-Ballesteros, Javier Baena-Espinar, María Elena Hernando, Susana Hernández-Prieto, Fernando López-Ríos, Noelia García Barrio, Santiago Ponce-Aix, Luis Paz-Ares-Rodríguez and Juan Luis Cruz-Bermúdez*
- Bridging Objective and Subjective Data: A Comprehensive Architecture for Wearable Health Research 1664  
*Matéo Rullier, Prasadini Padmasiri, Gunnar Hartvigsen, Tor-Arne Schmidt Nordmo, Erlend Farbu, Anja Davis Norbye and André Henriksen*
- Patient Trajectories with High-Frequency PROMs Integrated into EHR Systems: A Comprehensive Outcome for Clinical Research and Care 1669  
*Martin Dugas, Robin Fleige, Max Christian Blumenstock, Paul Krczal, Matthias Ganzinger, Fleur Fritz-Kebede, Susanne Dugas-Breit, Tobias Dittrich, Stephan Christoph Feder and Pavlina Lenga*
- Standardizing Late-Effects Data Capture in Childhood Cancer Survivorship: A FHIR-Based Follow-Up Questionnaire 1674  
*Roberta Gazzarata, Monica Muraca, Andrea Beccaria, Brigitte Nicolas, Francesca Bagnasco, Giorgio Cangioli, Wylem Bars, Catherine Chronaki, Davide Saraceno and Riccardo Haupt*

- Developing an HL7 FHIR Implementation Guide for Rare Cancers:  
The IDEA4RC Project Experience 1679  
*Roberta Gazzarata, Giorgio Cangili, Wylem Bars, Catherine Chronaki,  
Eugenio Gaeta, Unai Zulaika, Vincenzo Falanga, Federica Saccà,  
Annalisa Trama and IDEA4RC Working Group*
- Automated Differential Time to Positivity Analysis for CRBSIs Using Historical  
Microbiological Data 1685  
*Julia Liepold, Leonhard Hauptfeld, Moritz Grob, Andreas Csarmann,  
Andrea Rappelsberger and Klaus-Peter Adlassnig*
- Reimagining Patient-Centered Pathways: Enhancing Pathway Development  
Methods with Patient-Centered Design Principles 1690  
*Emily Hickmann, Maren Kählig, Nick Heidmann, Peggy Richter  
and Hannes Schlieter*
- Kernel Density Estimation of Wearable Signals to Predict Preoperative  
Cancellation Risk 1695  
*Johan-Niillas Ludviksen Jernsletten, André Henriksen  
and Gunnar Hartvigsen*
- Development of a Real-Time Operative System on RTOS Dashboard for Risk  
Management in Hospitals: A Case Study at Kalasin Hospital, Thailand 1700  
*Abhichaya Areeauey and Songkhamchai Leethongdissakul*
- Identification of Reliable Biomarkers for ALS Through Machine Learning  
Approach 1705  
*Renu Yadav, Pragya Pragya and Jac Fredo Agastinose Ronickom*
- Patient Rights to Correct Errors in the Electronic Health Record: Comparison of  
Legislation in Sweden, UK, and Germany 1710  
*Anna Kharko, Charlotte Blease, Josefin Hagström, Björn Schreiweis  
and Maria Hägglund*
- Efficient Route Plan for Intra-Hospital Patient Transport Using Multi-Modal  
Optimization Methods 1715  
*Saran Karthikeyan, Cord Spreckelsen and Sasanka Potluri*
- Predicting Lung Function from Voice Recordings Using Machine Learning: An  
Optimised Approach 1720  
*Sania Fatima Sayed, Reyer Zwiggelaar, John. W. Holloway  
and Faisal I. Rezwan*
- MAP-CARE: Enhancing Cross-Lingual Medical Intervention Terms 1725  
*Hugo Guillen-Ramirez, Karen Triep, Christophe Gaudet-Blavignac,  
Baljit Phull, Guido Beldi and Olga Endrich*
- Enhancing Cross-Sector Collaboration in Diabetes Care Through  
a Shared-Viewer Platform: Clinical Experiences with SAMBLIK-Diabetes 1730  
*Morten Bonde Klausen, Anne Skovager Thomsen, Anelli Sandbæk,  
Thim Prætorius and Morten Haaning Charles*
- The Association of Software Sophistication with Quality of Care Outcome –  
The Case of Hospital Acquired Pressure Ulcers 1736  
*Jana Strate and Ursula H. Hübner*

Support for Molecular Tumor Board Presentations in cBioPortal <i>Dominik Boehm, Marco Schindler, Cosima Strantz and Philipp Unberath</i>	1741
Digital Twins in Healthcare: Enabling Predictive, Personalized, and Precision-Driven Transformation <i>David Manne</i>	1746
Evaluating and Adapting Quality Criteria for Digital Health Apps in Frailty and Dementia Care <i>Emmanouil S. Rigas, Antonios Billis, Luc Nicolas and Panagiotis D. Bamidis</i>	1751
Frequency of Use of the MyFood4Senior App, a Personalised Digital Intervention to Empower Seniors to Follow a Healthy Lifestyle <i>Francisco Sivianes-Castillo, Elena Alonso-Aperte, Cristina Álvarez-Martin, Maria Dolores Hernández, Jorge Ropero and Rocio de la Iglesia</i>	1756
Health Data Set Bias Examination in the European Health Data Space <i>Evangelia Anna Markatou and Catherine Chronaki</i>	1761
Childbirth Mobilities: A Geo-Spatial Simulation Approach <i>Rocco Paolillo, Filippo Accordino and Fabrizio Pecoraro</i>	1766
Barriers to Patient Inclusivity in GeoHealth Platforms: Usability Testing Insights <i>John Geracitano, Kaushalya Mendis, Christopher Shea and Saif Khairat</i>	1771
Comparative Post-Market Evaluation of Two Generations of Digital Devices for Growth Hormone Therapy: Adherence and Performance Support <i>Paul Dimitri, Lilian Arnaud, Melissande Simonin, Marie-Nathalie Castel, Octavio Rivera-Romero and Ekaterina Koledova</i>	1776
Telemedicine and Teleexpertise for Pregnancy Monitoring <i>Thomas Alassane Ouattara, Seydou Golo Barro and Pascal Staccini</i>	1778
Factors Associated with the Acceptance of Communication Robots Among Formal Caregivers in Home-Based Care <i>Sakiko Itoh, Kentaro Watanabe, Hiroyasu Miwa and Tomoko Wakui</i>	1783
Leveraging Clinical Data Warehouses to Detect Potential False-Negatives EBV Patients Automatically <i>Morgane Pierre-Jean, Pauline Comacle, Denis Delamarre, Remy Jestin, Vincent Thibault and Marc Cuggia</i>	1785
Toward Gender-Aware Digital Twins for Modeling Cognitive Decline <i>Shrutha Morthala and Ankica Babic</i>	1787
Association of Objective Medical Device Alarm Metrics and Clinician-Reported Alarm Fatigue in Intensive Care Medicine <i>Mona Prendke, Amin Chaoui, Martin Bukowski, Felix Balzer, Akira-Sebastian Poncette and Anne Rike Flint</i>	1789
Balancing Engagement and Validity in Game-Based Cognitive Assessments <i>Krister Bauge and Ankica Babic</i>	1791
Evaluation of Healthcare Data De-Identification with WiseSpace Tool <i>Olga Vovk, Gunnar Piho and Peeter Ross</i>	1793

- Designing a Digital Twin for Equitable Blood Donation Logistics in Geneva 1795  
*José Bouzo Cueva, Ivana Perelli, François Freitas, Sophie Waldvogel  
and David-Zacharie Issom*
- Sukunn: Bridging Spiritual Heritage and Modern Digital Mental Health 1797  
*Zain ul Abideen Tariq, Younss Ait Mou, Dana Househ, Manahil Zulfiqar,  
Anis Troudi and Mowafa Househ*
- Strategic Management of Medical Equipment and Pharmaceuticals in Burkina  
Faso Using an Integrated Information System: Methodology 1799  
*Thomas Alassane Ouattara, Charles Nkuna Wa Nkuna  
and Wend-Yam Carine Nikiema*
- Professionals' Perspective on the Use of Digital Patient Forms in Women's  
Health 1804  
*Mathilda Hedbeck and Nadia Davoody*
- Evaluating Caregiver Satisfaction with the Use of a Digital Self-Management  
Device and Its Support Programme for Paediatric Growth Hormone Therapy in  
Italy: A Research Protocol 1806  
*Ilaria Longo, Caterina Rizzi, Andrea Paolillo, Ekaterina Koledova  
and Octavio Rivera-Romero*
- An Open-Source Abstraction Framework for Biosignal and Medical Device  
Data 1808  
*Nils Freyer, Rainer Röhrig and Myriam Lipprandt*
- Development and Initial Approach of a Pro-Adaptive Monitoring System for  
Parkinson Disease Symptoms 1810  
*Sinan Yavuz, Robin Grashof, Thomas Nitsche, Bernhard Breil  
and Edwin Naroska*
- Utilization Patterns of Traditional Korean Medicine Treatments for Pain-Related  
Disorders: Analysis Based on a National Survey in Korea 1812  
*Mi Hong Yim*
- "More than a pretty face": Graphic User Interface Rubric for Assessment of  
Digital Health Platforms 1814  
*Luciana Terceiro, Maria Hägglund and Anna Kharko*
- From Disruption to Support? Co-Creating eHealth Tools for Self-Care Among  
Older Adults with Chronic Illness 1816  
*Susanna Strandberg and Sofia Backåberg*
- Frameworks for Digital Health Engagement: A Scoping Review Protocol 1818  
*Chinasa Odo, Sarath Rathnayake, Veronica Parisi, Joshua Pink  
and Rebecca Randell*
- Development and Implementation of a Digital Tool for Fluid Balance  
Management in Hospitalized Pediatric Patients: Potential Impact on  
Morbidity and Mortality Associated with Fluid Therapy 1820  
*Alberto Hernández, Gustavo Carolo, Ana Arias, Gabriel Agüero  
and Fernando Sanz*

Challenging Interoperability: Mapping and Validation of a Swiss Medication Catalogue to RxNorm	1822
<i>Karen Triep and Olga Endrich</i>	
Evidence-Based, Digitally-Enabled Support and Care for Older Pre-Frail Adults	1825
<i>Antonios Billis, Georgios Petridis, Nikolaos Pazaras, Maria Karagianni, Vicky Zilidou, Afroditi Tzortzi, Styliani-Olympia Tsormpatzoudis, Chrysoula Bampa, Constantinos Bakogiannis, Vassilios Vassilikos and Panagiotis Bamidis</i>	
TrustInAging: Digital Tools for Healthy Aging	1827
<i>Giordano Lanzola, Silvana Quaglino, Elena Cavallini, Serena Lecce, Sara Bottiroli, Matteo Vandoni, Luca Marin, Michele Conti, Alice Tartara, Mattia Rogledi and Micaela Schmid</i>	
<b>Section 8. Telemedicine and Telehealth</b>	
A Maturity Model for REDCap-Based Patient-Facing Technologies: A Roadmap Toward Patient-Centered Intelligence	1830
<i>Zhengcan Xie, Yuheng Shi, Eric Yang, Yun Jiang and Yang Gong</i>	
From Spreadsheets to FHIR and Research Databases: Digitizing Medication Data in Elderly Care Within the RM4Health Project	1835
<i>Vinicius Lima, Rute Almeida, Izabela Calvi, Daniela Domingues, Rafael Martins, Filipe Bernardi, Luis Conceição and Alberto Freitas</i>	
Implementation and FAIR Evaluation of Clinical Data Provision Framework	1840
<i>Shozo Konishi, Kazuo Okamura, Aoi Yamaguchi, Kento Sugimoto, Shoya Wada, Katsuki Okada and Toshihiro Takeda</i>	
Metabolic Syndrome Surveillance Through Hospital Informatics in Northeastern Thailand	1845
<i>Jadsadakorn Purachago, Tharinee Srisaknok, Le Lam Tuyet Duy and Ranee Wongkongdech</i>	
Citizens' Perceptions and Experiences of Self-Measurements in Telehealth – A Case Study	1850
<i>Jeppe Eriksen, Kristina Tornbjerg Eriksen, Ditte Weber, Søren Vingtoft and Christian Nøhr</i>	
Experiences from Multi-Method Testing of a Comprehensive Mobile Health App	1855
<i>Tina Rishaug, Eirik Årsand, Meghan Bradway, Miroslav Muzny, Pietro Randine, Reetta Välimäki, Gunnar Hartvigsen, Mikael Rinnetmäki and André Henriksen</i>	
Decision-Making in Epilepsy Care - Are Digital Services Underutilised?	1860
<i>Milla Rosenlund, Niina Reinikainen, Virpi Jylhä and Hanna Kuusisto</i>	
Errors That Matter: Negative Experiences of Incorrect and Incomplete Health Records Among Youth in Mental Healthcare	1865
<i>Josefin Hagström, Maria Hägglund, Charlotte Blease and Anna Kharko</i>	

Large Language Models for Automating Conformance to Health-Data Standards: The Interoperability Case of HL7 FHIR and OMOP <i>Ali Raza, Christian Esposito and Mauro Giacomini</i>	1870
Privacy-Preserving Self-Registration to a Large-Scale Randomised Controlled Clinical Screening Trial in Austria <i>Dieter Hayn, Martin Baumgartner, Peter Willeit, Emanuel Sandner, Fabian Wiesmüller, Markus Müllner-Rieder, Stefan Beyer, Kurt Edegger, Patrick Mayr, Aaron Lauschensky, Melanie Woodford, Helen Aumayer, Lena Hofhansel, Michael Schreinlechner, Daniel Pavluk, Ivan Lechner, Martin Manninger, Sebastian J Reinstadler, Daniel Scherr, Axel Bauer and Guenter Schreier</i>	1875
A Unified Database for a Set of Clinical Studies on the Treatment of Bacterial and Fungal Infections Within the MULTI-SITA Project <i>Stefano Antola, Selene Gallone, Ylenia Murgia, Daniele Roberto Giacobbe, Matteo Bassetti and Mauro Giacomini</i>	1880
Proposed Schema Extensions and ETL Pathways for Integrating Wearable and Patient-Reported PGHD into OMOP-CDM for Secondary Use <i>Somayeh Abedian and Rada Hussein</i>	1885
A Privacy Index Calculator for Federated Medical Studies <i>José Gameiro, Vicente Barros, João Rafael Almeida and José Luís Oliveira</i>	1890
An Automatic Data Extracting Method for REDCap Folder Mapping: An Example for Cardiological Clinical Case <i>Patrizia Vizza, Mariaghita Cassano, Laura Azzinnaro, Aurora Delfino, Danilo Arnone, Rossella Quarta, Alberto Polimeni, Pietro Hiram Guzzi and Pierangelo Veltri</i>	1895
Adoption and Use of Proxy Online Record Access in Sweden – A Retrospective Analysis <i>Maria Hägglund, Anna Kharko, Sara Riggare, Charlotte Blease, Josefin Hagström and Therese Scott Duncan</i>	1900
Representing Clinical Scales in SNOMED CT: A Proposed Extension <i>Mirjam Mattei, Monika Baumann, Julien Ehram, Christian Lovis and Christophe Gaudet-Blavignac</i>	1905
Usability of Mobile Health Apps from the Patient Perspective: A Systematic Review <i>Pietro Bosoni, Giovanni Gasparini, Samuele Pe, Cristiana Larizza, Silvana Quaglini and Giordano Lanzola</i>	1910
A Tool for Virtual Nursing Utilization in Emergency Reception: An Exploratory Machine Learning Approach <i>Zhaoqiang Zhou, John Geracitano, Sandy Hatoum and Saif Khairat</i>	1915
Patient Perspectives on Telemonitoring in Insulin-Treated Type 2 Diabetes: Preliminary Findings from a Qualitative Study <i>Pernille Secher, Clara Bender, Thomas Kronborg, Peter Vestergaard, Morten Jensen and Stine Hangaard</i>	1920

- Feasibility of Patient-Reported Outcomes in a Type 2 Diabetes Telemonitoring Trial 1922  
*Iben E. Giese, Sisse H. Laursen, Pernille F. Barington, Peter Vestergaard and Stine Hangaard*
- Feasibility of HbA1c Blood Sampling in a Telemonitoring Trial for People with Poorly Controlled Type 2 Diabetes 1924  
*Stine Hangaard, Iben Giese, Pernille Barington, Peter Vestergaard and Sisse Laursen*
- MHealth in the Context of Cancer Patient Navigation: A Systematic Review 1927  
*Marco Antonio Fernandes and Itamir de Moraes Barroca Filho*
- Using Video Feedback to Support Physical Function in Older Adults: Healthcare Professionals' Perspective 1929  
*Jessica Olovsson and Sofia Backåberg*
- Digitization of Community Health in Mali: A Qualitative Study on the Implementation of the DISC-Mali Program (2023–2024) 1931  
*Mahmoud Cisse, Anouzo Kone, Mamoutou Diabate, Augustin Rashidi Maulidi Amboko and Cheick Oumar Bagayoko*
- Telemonitoring of COPD Patients Reduces Hospital Admission Rate 1933  
*Zeina Safi, David Olander, Leili Lind, Petra Jacobson and Hans Lennart Persson*
- Monitoring Adherence to PBM Guidelines from Clinical Data Warehouse: A Case Study 1935  
*Paul-Antoine Beaudoin, Alexandre Godon, Sebastien Marquet, Thomas Boulter and Alexandre Moreau-Gaudry*
- Integration of Patient-Reported Outcomes into the OMOP Common Data Model 1937  
*Adnan Jouned, Laura Verbei, Florian Katsch, Marta Ferri Peradalta, Sofia Bazakou, Tanja Stamm, Georg Duftschmid and Renske Los*
- Heuristic Evaluation of a Web-Based Telemonitoring Application for Chronic Obstructive Pulmonary Disease 1939  
*Julie Egmose, Pernille Heckendorff Secher, Thomas Kronborg and Stine Hangaard*
- Adaptive Access Governance in Healthcare 1941  
*Francesco Capparelli, Maria Rosaria de Ligio and Giulia Finocchiaro*
- Electronic Patient Records, Real-Time Clinical Documentation and Burden: An Umbrella Review 1943  
*Sarath Rathnayake, Nimantha Karunathilake, Chinasa Odo, Veronica Parisi, Joshua Pink, Jiada Tu, Wenhong Zhao and Rebecca Randell*
- Usability and Satisfaction with the WiseApp and CleverCap: A Culturally Adapted mHealth Intervention for Spanish-Speaking People Living with HIV in the Dominican Republic and New York City 1945  
*Rebecca Schnall, Claudia L. Michaels, Eunice Sánchez, Anthony Alexander, Jean Jimenez, Mina Halpern, Maeve Brin, Sergio Ozoria Ramirez, Samantha Stonbraker and Pamela Báez Caraballo*

- Integrating Medical Imaging into Open-Source Electronic Medical Records:  
A Case Study of Orthanc and OpenMRS 1947  
*Weï Sadre, Benoît Duhoux and Sébastien Jodogne*
- Personalized Digital Health for IoMT 1949  
*Silvia Llorente, Daniel Naro and Jaime Delgado*
- Usability of a Telemonitoring System for People with Type 2 Diabetes on Insulin  
Therapy 1951  
*Thomas Kronborg, Jannie Nørlev, Morten Hasselstrøm Jensen,  
Peter Vestergaard and Stine Hangaard*
- Process Mining for Quality Improvement in Malawi 1953  
*Dumisani Nkhoma, Matthias John and Usman Iqbal*
- Retrospective Hypomimia Rating via Mobile App: A Usability Study 1955  
*Alexander Johannes Wiederhold, Lea Haidar and Christopher Gundler*
- Handling of Nursing Care Information in Personal Health Records 1957  
*Masaharu Nakayama*
- “THEBEA App” Prototype as a Digital Tool for Therapy Support in  
Orthopedics and Trauma Surgery 1959  
*Tobias Michels, David Snowdon, Dirk Möller, Nikolaus Ballenberger  
and Christoff Zalpour*
- FitAdhere: A Mobile Health Platform Supporting Adherence to Protocol-Based  
Therapeutic Exercise 1961  
*George Tsalkitzis and Vassiliki Koufi*
- Section 9. OneHealth**
- An Automated Synchronization Strategy for MAUDE Literature Dashboard 1964  
*Yuheng Shi, Eric Yang, Zhengcan Xie and Yang Gong*
- From Data to Decisions: Challenges Experienced by Flemish Hospitals 1969  
*Maxim Riebus and Niels Martin*
- Personalizing Mobile Applications for Health Behavioral Change According to  
Age and Gender 1974  
*Laetitia Gosetto, Gilles Falquet, Christian Lovis and Frédéric Ehrler*
- Identifying and Evaluating User-Centered Requirements for Pro-Adaptive  
Assistive Systems in Parkinson Disease 1979  
*Robin Grashof, Sinan Yavuz, Edwin Naroska, Thomas Nitsche  
and Bernhard Breil*
- Assessing Musculoskeletal Discomfort and Ergonomic Risks Among Healthcare  
Assistants at Operation Room: A Cross-Sectional Study in Thailand 1984  
*Patcharida Saengdang, Kallaya Harnpicharnchai, Ekarat Sombatsawat  
and Teeraphun Kaewdok*
- The ESCAPE Framework: A Practical Two-Phase Mixed-Methods Approach for  
Usability Evaluation of Interoperable Health IT 1989  
*Hwayoung Cho, Yingwei Yao, Taeheon Lee, Jiang Bian and Gail Keenan*

- Digital Health Literacy and Dementia-Preventive Behaviors Among Rural Older Adults: Evidence from a Community-Based Study 1994  
*Pornthep Choochot, Kamonrat Sarawong, Theeranad Jaimunkandee, Ranee Wongkongdech and Adisorn Wongkongdech*
- AI-Based Dialogue Systems for Informed Consent in Radiology: Professional Perspectives from the KIPA Study 1999  
*Patricia Gleim, Carolin Heizmann, Mascha Goldschmitt, Thomas Rigotti and Philipp Kellmeyer*
- Monitoring of Potential Malignant Oral Lesions and Oral Cancer; Touchpoints for Innovations to Improve Oral Healthcare 2004  
*M.C.C. Groenevelt, M.P. Fransen, J.B. Poell, W.H. Schreuder, E.R. Brouns and L.W.P. Dusseljee-Peute*
- An mHealth Design Framework for Older Adults 2009  
*Ching Huang, Elizabeth M. Borycki and Claudia Lai*
- Learning from International Experiences Delivering Virtual Urgent Care Services Through a Single Front Door: A Narrative Review 2014  
*Elizabeth Kells, Kavisha Shah, Jagdev Singh, Nirvana Luckraj, Melissa Baysari, Adam Johnston, Matthew Roger, Owen Hutchings, Michelle Chen, Clara Chow, Tim Shaw and Adeola Bamgboje-Ayodele*
- Social Isolation, Social Capitals, and Quality of Life Among the Elderly During the COVID-19 Pandemic in the Northeast of Thailand 2019  
*Suwairin Srichai, Kritsana Aunthakhot and Wongsa Laohasiriwong*
- Reconstructing Longitudinal Medication Trajectories from Integrated National Claims and Clinical Data Warehouse Data: An Application in Oncology 2024  
*Mathilde Bories, Pascal Le Corre, Aurélie Bannay, Sylvain Robert, Marc Cuggia and Guillaume Bouzille*
- Retrospective and Spatial Analysis in Healthcare Facilities: Measuring the New Hospital Giannina Gaslini Performance 2029  
*Simone Falco, Federico Campanini, Francesca Rocca and Mauro Giacomini*
- Cultural Tailoring of a Mobile Health Application to Support Postpartum Symptom Monitoring 2034  
*Natalie Benda, Sarah E. Harkins and Janice Aubey*
- Identification of Potential Biomarkers in ASD Integrating RNA Seq Data and Machine Learning Approaches 2039  
*Km Jaya Devi, Pragya Pragya and Jac Fredo Agastinose Ronickom*
- Designing the Thinking: Reimagining Health Informatics via Journey Maps and Personas 2044  
*Amanda L. Joseph, Amy Price, Carolyn Petersen and Yuri Quintana*
- ‘Smarter’ Buffalo: Image Analysis Applications in Livestock Science 2049  
*Roberta Matera, Matteo Santinello, Federica Pierro, Antonio Calamo, Roberta Cimmino and Oscar Tamburis*

- Strategic Alignment for Digital Transformation in German Hospitals:  
A Qualitative Study on Critical Success Factors 2051  
*Annika Hering, Helen Hedwig Künnemann and Jan-David Liebe*
- Accessibility of Digital Health and Welfare Services Among Immigrants in  
Finland 2056  
*Anna Vahteristo, Hanna Kuusisto and Virpi Jylhä*
- Unequal Flows? Economic Dimensions of Sharing Anonymized Data in  
Biomedical Research 2061  
*Thierry Meurers, Mehmed Halilovic, Hammam Abu Attieh,  
Jérémi Despraz, Bayrem Kaabachi, Karen Otte, Grigorios Papapostolou,  
Jean Louis Raisaro and Fabian Prasser*
- Identification of Ecological and Human Health Indicators Based on Geographic  
and Spatial Mapping 2066  
*Nimrod Tachnai, Gur Hanan, Oscar Tamburis and Arriel Benis*
- A Human-Centered, Multi-Stage Clinical Decision Pathway for an AI-Based  
CDSS for Delirium Prevention 2071  
*Carolin Heizmann, Patricia Gleim, Alexander Ritz, Sophia Mühlmann,  
Sven Ziegler and Philipp Kellmeyer*
- Sustainability in Food-Based Dietary Guidelines: Digital Readiness in Nordic  
Versus Mediterranean Countries 2076  
*Taridzo Chomutare, Rouven Besters, Miroslav Muzny, Phuong Dinh Ngo,  
Fred Godtlielsen and Maryam Tayefi*
- Integrating Metabolomics and Digital Tools to Valorise Aromatic Ecotypes in  
Sustainable Agriculture 2081  
*Poonam Devi, Maria Ponticelli, Anna Paola Lanteri, Mauro Giacomini,  
Norbert Maggi, Emanuele Rosa, Valentina Parisi, Nunziatina de Tommasi  
and Angela Bisio*
- Plant Defense Unveiled: From Classical Experiments to Bioinformatics-Driven  
Genomics 2086  
*Maria Ponticelli, Poonam Devi, Anna Paola Lanteri, Mauro Giacomini,  
Norbert Maggi, Emanuele Rosa, Valentina Parisi, Nunziatina de Tommasi  
and Angela Bisio*
- Learning Deep Temporal Representations of Socioeconomic Deprivation 2091  
*Mareile Beernink, Ai-Care Consortium and Christopher Gundler*
- Exploring Citizens' Participation Preferences in the Development and  
Evaluation of Digital Health Interventions 2093  
*Vera Weirauch, Melanie Rogge and Sven Meister*
- Application of Metagenomics and Artificial Intelligence for Pathogen  
Characterization in Domestic Animals and Epizootic Prediction: A Systematic  
Review and Meta-Analysis 2095  
*Amadou Dicko, Seydou Golo Barro, N. Siourimè Somda, Salif Sombie,  
Ousseni Bandaogo, Germain Sanou, Mathew D. Esona and  
Juste Isidore O. Bonkougou*

Exploring Patient-Facing Staff Perspectives on Digital Consent Management: Insights from the CONSENT Project	2097
<i>Panos Bonotis, Anastasia Terzi, Pantelis Angelidis and Stamatia Bibi</i>	
Personalizing Breast Cancer Care Through a Patient Portal and EHR-Integrated Decision Support Tool	2099
<i>Megan E. Salwei, Barbara Voigtman, Janelle Faiman, Carrie Reale, Ryan Myles, Russ Beebe, Allison B. McCoy and Matthew B. Weinger</i>	
Evaluation of a Mobile Emergency Alert System Using GAQM	2101
<i>Jennifer Kircher and Johannes Schobel</i>	
Causal Inference on Air Pollutants and Atopic Dermatitis Outpatient Visits in Young Children: An Instrumental Variable Approach	2103
<i>Su Hwan Kim, Seong Pyo Kim, Zio Kim, Heung-Woo Park, Minseon Park, Jin Youp Kim and Hyung-Jin Yoon</i>	
Evaluation of Consumer Barriers to the Adoption of the Single Front Door	2105
<i>Adeola Bamgboje-Ayodele, Monique Hines, Kavisha Shah, Jagdev Singh, Nirvana Luckraj, Melissa Baysari, Adam Johnston, Matthew Roger, Owen Hutchings, Michelle Chen and Tim Shaw</i>	
Predicting COVID-19 Vaccination Decision-Making Profiles Among Dutch Adults: From Survey to National Administrative Data	2107
<i>Taymara C. Abreu, Javier Bernardo-Garcia, Isabelle de Wolf, Mitchell Matthijssen, Danielle Timmermans and Vincent Buskens</i>	
From Clinical Data Warehouses to Epidemiological Indicators: A Methodology for Real-Time Surveillance	2109
<i>Thomas Jaylet, Amélie Brejot, Valérie Bertaud, Marc Cuggia, Emmanuelle Sylvestre and Morgane Pierre-Jean</i>	
Leveraging ANACONDA for Data Quality Assessment in National Mortality Databases: The Serbian Case Study	2111
<i>Marija Anđelković Apostolović, Aleksandra Ignjatović, Miodrag Stojanović, Vedrana Pavlović and Branislav Apostolović</i>	
Patient-Reported Social and Financial Needs: Integration in a Learning Health System	2113
<i>M Beauchemin, D. DeStephano, R. Khurana, N. Benda, K. Natarajan, G. Hruby, N. Dreher, C. Sathe, J. Kahn, S. Rosenberg, L. Pinheiro and D. Hershman</i>	
Digital Inveillance for Zoonotic Diseases: Towards EHDS-Ready One Health Integration	2115
<i>Paulos De Jesus Loureiro</i>	
Safety First: A Longitudinal Study of Technology Adoption in a Nursing Home	2117
<i>C. Schneider, T. Schmid, H.J. Luethi and F.J.S. Thilo</i>	

## Section 10. Education

- Agent-Based Improvement of Multiple-Choice Question Quality in Medical Education 2120  
*Lilly Marie Düsterbeck, Michael Grössler, Graziella Credidio, Louis Bellmann and Layla Tabea Riemann*
- Methods for Usability Testing an Educational Simulation: A Case-Study Using a Maternal Telehealth Scenario 2125  
*Blake Lesselroth, Helen Monkman, Karalane Bellavia, Mataeo Anderson, Jacob van Buren, Kelsey Snider, Andersen Tanriverdi, Charles Parsons, Sophia Nguyen, Chloe Lesselroth, Raye Reeder, Juell Homco, Morgan Richards and Karen Gold*
- Iterative Design of an Educational Telemedicine Simulation: Addressing Usability Issues to Enhance the Simulation 2130  
*Helen Monkman, Juell Homco, Karalane Bellavia, Mataeo Anderson, Andersen Tanriverdi, Chloe Lesselroth, Sophia Nguyen, Karen Gold, Morgan Richards, Kristin Foulks and Blake Lesselroth*
- Topic Modeling and Trend Analysis in Medical Education Literature Using Projective Non-Negative Matrix Factorization 2135  
*Emir Karayağız, Beyzanur Siyah, Yunus Emre Kayaoğlu, Nisanur Tokay and Tolga Berber*
- Feasibility of LLM-Assisted Communication Feedback in Simulation-Based Medical Education: A Pilot Study 2140  
*Mohamed Alhaskir, Hannah Haven, Michael Langer, Tim Peters, Miriam Hertwig, Jenny Unterkofler, Christopher Plata, Simon Ostermann, Yannik Haven, Kai O. Hensel and Jonas Bienzeisler*
- Open Educational Resources on FAIR Data: Preliminary Results from a Systematic Review 2145  
*Myrthe I. van Heerde, César H. Bernabé, Ronald Cornet and Martijn G. Kersloot*
- Video-Based Learning to Improve Laboratory Safety Knowledge in Occupational Health Education 2150  
*Kallaya Harnpicharnchai, Rattanaphon Chalawlerd, Pornthita Srikulvong, Chuleewan Thunyasirinon and Patcharida Saengdang*
- Developing a Roblox-Based Fire Drill Simulation for Safety Training in Occupational Health Education 2155  
*Kallaya Harnpicharnchai, Pornthita Srikulvong, Phuwichaya Aksorn, Rattanaphon Chalawlerd, Wannisa Phoklang and Patcharida Saengdang*
- Integration of cBioPortal into Medical Education: Evaluating Its Didactic Potential in the Context of Personalized Medicine 2160  
*Iryna Mamuilova, Sude Eda Koçman, Timo Apfelbacher, Andreas Wienke and Jan Christoph*

Interoperability Skills for Digital Health: A Reference Model from the XiA Project	2165
<i>Francini Hak, Ailton Moreira, Manuel Santos, Maria Salazar, Maarja-Liis Elland, Aygul Nizamieva, Michal Juhas, Marie-Alexandra Lambot, Outi Ahonen, Natalia Allegratti, Juliana Sá, Simon Lewerenz and Henrique Martins</i>	
Development of a Voice Awareness System in Local Languages for Maternal and Child Health in Burkina Faso	2170
<i>Lydie Simone Tapsoba and Relwendé Aristide Yameogo</i>	
Extending Consys to Integrate the Patient's Health Issue Network (HIN) and Clinical Pathways for Clinical Reasoning	2175
<i>Fabrizio Pecoraro, Fabrizio Consorti, Daniela Luzi, Fabrizio Murgia, Oscar Tamburis and Fabrizio L. Ricci</i>	
Beyond Sequential Teaching: A Concurrent Model for AI in Medicine	2180
<i>Gheorghe Ioan Mihalas, Daniel Goje, Andrei Craciun and Daniel Lighezan</i>	
Redesigning Python Programming Course in the Generative AI Era: An Italian Case Study	2185
<i>Giovanna Nicora, Cristiana Larizza, Filippo Scaglione, Enea Parimbelli and Silvana Quaglini</i>	
Training Future Health and Information Technologies Professionals on the European Health Data Space	2190
<i>Sharon Guardado, Woubshet Behutiye, Ornela Bardhi, Saara Kukkohovi and Minna Isomursu</i>	
From Framework to Practice: Planning the Implementation of the Digital Health Education Toolkit in Australian Universities	2195
<i>Kerryn Butler-Henderson, Stephen Guinea, Leanna Woods, Melanie Kam, Melanie Haines and Clair Sullivan</i>	
Usability of a Patient Portal in Patients with Digital Support Needs: A Think Aloud Study	2200
<i>Anouk F.A. Raanhuis, H.J. Harm Gijsbers, Silke Ruijs, Linda W. Peute and Susan J. Oudbier</i>	
Garbage In, Garbage Out: Context Engineering for Generating Multiple-Choice Questions for Medical Education Using Knowledge Graphs and LLMs	2205
<i>Michael Grössler and Layla Tabea Riemann</i>	
Opinions of University Students and Healthcare Professionals About Health Informatics	2210
<i>Maria Tsirintani, Paschalina Lialiou and Parisi Gallos</i>	
Empirical Comparison of Causal Machine Learning and Post-Hoc AI Interpretability Models for Risk Factor Analysis: An Application to Medical Specialty Choice	2215
<i>David Vicente Alvarez, Milena Abbiati, Alban Bornet, Georges Savoldelli, Nadia Bajwa and Douglas Teodoro</i>	

- Practical Teaching Units Focusing on the Integration of Medical Research Data:  
Updating the MI-Lab 2220  
*Mona Perbix, Sebastian Stäubert, Matthias Löbe, Alfred Winter  
and Christian Draeger*
- Personalize and Advance Your Education with PAVE: A Precision Education  
Initiative 2225  
*Leigh Powell, Radwa Nour and Nabil Zary*
- Bridging Theory and Practice: A Matrix-Based Approach to Teaching Medical  
Data Science with MIMIC-IV Demo Dataset 2230  
*Falk Meyer-Eschenbach, Thorsten Schaaf, Louis Agha-Mir-Salim,  
Jon Barrenetxea, Oliver Kumpf, Severin Kohler, Elias Grünewald,  
Johanna Nothacker, Christof von Kalle and Felix Balzer*
- Recommendations for Establishing a Master's Degree in Digital Health Services 2235  
*Anne M.V. Bosch, André Henriksen, Eirik Årsand, Tina Rishaug  
and Gunnar Hartvigsen*
- Scaling Up Digital Health Education at Sorbonne University: Year Two  
Evaluation of the SN@SU Training Program 2240  
*Brigitte Seroussi, Sarah Teveny, Lindsay Morel, Aurélie Legastellois,  
Xavier Tannier and Ferdinand Dhombres*
- Integrating the Learning, Cognition, AI, and Pedagogy (L-CAP) Framework into  
Health Professions Education 2245  
*Pushpa Kumarapeli, Simon de Lusignan and Tia Haddad*
- SurgiBot: Large Language Model-Based Patient Simulator for Surgical  
Informed Consent Training 2250  
*Lana Cvijic and Kerstin Denecke*
- Teaching Applied Artificial Intelligence in Health Schools: An Example from  
Rouen and Nice Universities in France 2252  
*Stefan J. Darmoni, Benjamin Popoff, Pierre Decazes, Coralie Le Calvez,  
Frank Dufour, Dominique Guerrot, Olivier Humbert, Arriel Benis,  
Julien Grosjean and Pascal Staccini*
- Improving Postoperative Outcomes Using Preoperative Patient Education 2254  
*Leoni Weltermann, Jonas Weber, Jérôme Defosse and Tom Strube*
- Using AI to Increase Research Capacity: The Writing to Improve Nursing  
Science (WINS) in the Caribbean Program 2256  
*Carolyn Sun, Roy A. Thompson, Oscar Ocho, Shelly-Ann Hunte  
and Shannon Harris*
- From Theory to Empathy: Integrating Human-Centered Design and Lived  
Experiences in e-Health Engineering Education 2258  
*Adrien Ugon, Akram Redjidal and Sylvia Pelayo*
- Preparing an AI-Enabled Workforce: Results of a Needs Assessment 2260  
*Susan H. Fenton, Richard Halpin, Litao Wang, Saifur Rahman  
and Diana Keosayian*

CODE MEDI: A Collaborative Hackathon for Health Informatics Education <i>Hyeon Ji Kim, Sona Ha, Jaerang Go, Bongjo Kim, Seongyeon Hwang, Younglim Choi, Hyunseok Kim and Minkook Son</i>	2262
Attitudes Towards the Use of ChatGPT Among PhD Medical Students <i>Ksenija Markovic, Nina Rajovic, Andrea Markovic, Dejana Stanisavljevic and Natasa Milic</i>	2264
Challenges and Opportunities in Postgraduate Digital Health Education <i>Léa Ponchel-Bourgain, Anthony Raffoul Rahme, Sophie Bernard, Marcela Szopos, Matthieu Resche-Rigon, Alain Cariou and Rosy Tsopra</i>	2266
Strengthening Digital Health Competencies in the LAC Region: Insights from the SAVOIR Project <i>Rémi Houpert, Mathilde Bories, Jacqueline Veronique-Baudin, Elsa Cecilia-Joseph, Sophie Flobinus, Sarah Quesnel-Crooks, Luis Para Larra, Marc Cuggia, Guillaume Bouzille, Boris Delange and Emmanuelle Sylvestre</i>	2268
Overcoming the Limitations of Standardized Patients Through Dynamic CPX Scenario Automation and Multimodal Clinical Representation <i>Sumin Seo, Anna Kim and Yongtaek Oh</i>	2270
An Action Research Study on Co-Designing a Mobile Health Monitoring Application for a 60-Year-Old Birth Cohort <i>Tiia Yrttiäho, Erika Jarva, Michele Atzeni, Maria Bulgheroni, Laura Giani, Margherita La Gamba and Minna Isomursu</i>	2272
Results of the Application of the E4Nursing® Platform in Nurses' Clinical Decision-Making <i>Brunna M. Cardozo, Rogério R. Rodrigues, Grace T.M. Dal Sasso and Daniela C.C. Barra</i>	2274
Design and Formative Evaluation of an Immersive VR Carbohydrate-Sorting Game for Diabetes Self-Management <i>Michal Krezalek, Clare Martin, David Duce, Shelly Coe, Marion Waite, Arantza Aldea and Inna Skarga-Bandurova</i>	2276
<b>Section 11. Human Centred Digital Health</b>	
Convergence to Steady State in LLM-Generated Ontological Concepts <i>Naren Khatwani, Lijing Wang, Shmuel T. Klein and James Geller</i>	2279
Long Covid and Digital Health in Switzerland: Potentials and Limitations <i>Beatrice Kaufmann, Gabriel Hess, Lana Cvijic and Kerstin Denecke</i>	2284
Nurses' Perspectives on a Telemonitoring Intervention for Type 2 Diabetes: Findings from a Feasibility Study <i>Iben E. Giese, Pernille F. Barington, Peter Vestergaard, Stine Hangaard and Sisse H. Laursen</i>	2289
Addressing the 'optimal cutoff' Bias in Primary Care Testing <i>Jack Dowie, Mette Kjer Kaltoft and Vije Kumar Rajput</i>	2294

Development of a Digitally Applicable Tool for Identifying Insulin Adherence Challenges Prior to Consultation <i>Jannie Nørlev and Stine Hangaard</i>	2299
Emerging Digital Interventions for ADHD: An Overview of Ongoing Clinical Trials <i>Elia Gabarron, Patricia Lopez-Resa, Octavio Rivera-Romero, Guillermo Lopez-Campos and Kerstin Denecke</i>	2304
Analysis of the Evolution of Participatory Health Technology in Type 1 Diabetes from the “.com” to LLM Era <i>Guillermo Lopez-Campos, Elia Gabarron, Enrique Dorronzoro, Octavio Rivera-Romero and Kerstin Denecke</i>	2309
User-Centered Design of a Replayable VR Game for Children with HCP <i>Susanne Werking, Tung Khau, David Flaig and Gerrit Meixner</i>	2314
Crucial Concepts in ‘Opening the Personal Gate Between Technology and Health Care’ <i>Michael Rigby, Kathrin Cresswell, Zoie S.Y. Wong, Elisavet Andrikopoulou, Mirela Prgomet, Jeppe Eriksen and Jordi Piera-Jiménez</i>	2319
Involving the User in Configuring a Large-Scale Electronic Health Record <i>Pieter Jelle Toussaint and Christoffer Uhlin Røkke</i>	2324
‘The stupid thing is, it’s all about money’: Clinician-Innovators’ Perspectives on Financial Sustainability of Digital Health Innovations in a Large Dutch Hospital <i>Zahra Niazkhani, Iris Wallenburg, Johanna Hendriks and Rik Wehrens</i>	2329
Empathic eHealth for Children: A Genetic Literacy Case Study Using Think-Aloud and Co-Creation <i>Corine Oldhoff-Nuijsink, Linda Dusseljee-Peute, Thomas Engelsma and Marloes Derksen</i>	2334
Exploring User Perspectives on a Digital Preconception Care Risk Assessment Tool <i>Marloes Derksen, Corine Oldhoff-Nuijsink, Elsbeth van Vliet-Lachotzki, Eric Steegers, Silva Harmsen, Lidewij Henneman and Mirjam Fransen</i>	2339
Evaluating the Usability of a Patient Portal: Insights from Older Migrant Adults <i>Maedeh Ghorbanian Zolbin and Sari Kujala</i>	2344
A Novel Approach for Handling Missing Data in Multivariate Time Series Clustering: Case Study on Predicting Delayed Graft Function <i>Mihir Momaya, Gyorgy Simon, Sergio Duarte and Lisiane Pruinelli</i>	2349
Electronic Health Record System Support for Physician–Patient Communication: National Cross-Sectional Survey on Outpatient Physicians’ Experiences <i>Tinja Lääveri, Anna Aspelund and Johanna Viitanen</i>	2354
Semantic Harmonization Workflow of Health Data: Application in the Post-COVID Network Netherlands <i>Hajar Hasannejadasl, Shuxin Zhang, Bianca M. Boxma-de Klerk, Jos Bosch, Ronald Cornet and Sander M.J. van Kuijk</i>	2359

Co-Creation and Advanced Analytics in Register-Based Analysis of Families with Children	2364
<i>Marika Helkiö, Anna Kuromaa, Minna Stolt and Anne Kuusisto</i>	
Who's Thinking About AI? Patterns of Artificial Intelligence Reference Across the Australian Specialist Digital Health Workforce	2369
<i>Salma Arabi, Kay Nicol and Kerryin Butler-Henderson</i>	
Ethics Committees and Technical Complexity in Digital Health Research	2374
<i>Francesco Capparelli, Maria Rita Sechi and Giulia Finocchiaro</i>	
A Quantitative Assessment of the Effects of Motivation on Autonomic Cardiorespiratory Activity in Challenging Listening Conditions	2379
<i>Davide Simeone, Edoardo M. Polo, Adriana A. Zekveld, Sophia E. Kramer, Riccardo Barbieri and Alessia Paglialonga</i>	
Profile-Aware Consent Management: A Conceptual Framework	2384
<i>Anastasia Terzi, Panos Bonotis and Stamatia Bibi</i>	
Empowering Rural Caregivers Through Participatory Design: Lessons from the 3WINpA Project	2389
<i>Martin Ernst, Johannes Pflegerl, Doris Maurer, Andrea Schmidt, Christina Lampl, Judith Goldgruber, Sandra Dohr, Gerhard Paulinger, Petra Plunger, Wolfgang Kratky, Vera Gallistl-Kassing and Eva Turk</i>	
An Empirical Study of LLMs for Engineering Medical Consent	2394
<i>Anastasia Terzi, Panos Bonotis, Christina Zoi and Stamatia Bibi</i>	
Findings from the PM4Onco Workshop on Determining Patient Similarity Search Strategies for Personalized Therapy in Molecular Tumor Boards	2399
<i>Iryna Mamuilova, Annemarie B. Weise, Julia Folwark, Sonja Hiemer, Susann Schulze, Manuela Benary, Arsenij Ustjanzew, Cosima Strantz, Philipp Unberath, Silke D. Werle, Benedikt Brors and Jan Christoph</i>	
Workarounds and Digital Health: Current Perspectives Through Human Factors, Person-Centred Practice and Patient Safety Lenses	2404
<i>Ann Carrigan, Melissa Baysari, Brendan McCormack, Paul Bowie, Catherine Calderwood, Kieran Egan and Siri Wiig</i>	
Orchestration and Small World Governance in the European Health Data Space	2409
<i>Simon Lewerenz and Henrique Martins</i>	
Harnessing Patient-Generated Data for Rare Disease Knowledge Enrichment: A Pilot Study	2415
<i>Selina Wai Yan Hui, Fangyi Chen, Kai Wang and Chunhua Weng</i>	
Innovative Virtual Solutions to Address the Gap in Aged Care in Regional Australia: What Are the Critical Work-System Elements Required?	2420
<i>Ann Carrigan, Agnivo Sengupta, Melissa Baysari, Georgina Luscombe, Ai-Vee Chua and Meredith Makeham</i>	
Erased in Code: Uncovering Cultural Gaps in Clinical Terminologies	2425
<i>Michael Muzoora, Claudia Finis, Sylvia Thun and Nina Haffer</i>	

- Relational Graph Convolutional Network with BERT Embeddings for Ontology Relationship Classification 2430  
*T.M. Rubaith Bashar, James Geller and Mengjia Xu*
- Participatory Technology Assessment in AI Development for Sleep Medicine 2435  
*Srushhti Trivedi, Friederike Seyderhelm, Robert Kossen and Dagmar Krefting*
- Digital Navigation: A UX Pilot Study in the Context of Pain Management 2440  
*Julie Guebey, Laëtitia Gosetto, Benno Rehberg-Klug, Christian Lovis and Aude Molinard-Chenu*
- From Records to Relationships: An Ontology-Based Knowledge Graph Framework for Cancer Data Interoperability 2445  
*Maria Papoutsoglou and Georgios Meditskos*
- Designing with Humans in the Loop: A Human-Centered Approach to AI-Based Healthcare Technologies 2450  
*Romarc Marcilly and Linda Peute*
- IoT-Based Biomedical Monitoring System for Preventive Maternal Healthcare and Early Detection of Obstetric Complications 2455  
*Diana Quiñonez, Yanira Benavides, Edgar Dulce-Villarreal, Alvaro Cervelion and Sixto Compañá*
- Exploring the Role of Robotics in Nursing Homes: Insights from Healthcare Professionals 2460  
*Mariann Fossum, Filippo Sanfilippo, Michael Rygaard Hansen, Camilla Enerstvedt and Elin Thygesen*
- Measuring the Acceptance of Humanoid Robots in Adult Day Care Facilities 2465  
*Arshia A. Khan*
- Empowering Dementia Caregivers: A Smart Mobile Solution for Stress Tracking and Support 2470  
*Yagna Manasa Boyapati and Arshia Khan*
- IT Barriers and Enablers for Implementing Electronic Patient Reported Outcome Measures: A Multi-Site Qualitative Study in Nine European Oncology Clinics 2475  
*Femke van Landschoot, Anne-Lore Scherrens, An Jacobs, Luc Deliens, Koen Pardon, Stein Kaasa, Marie Fallon, Kathrin Cresswell, Tonje Lundebj, Marianne J. Hjermsstad, Lorraine Warrington, Steven Olde Damink, Nicoleta Mitrea, Dag Ausen, Geana Paula Kurita, Andrés Cervantes, Augusto Caraceni, Kim Beernaert and MyPath Consortium*
- From Mandate to Normalization: Evaluating the Embedding of an Electronic Medication System into Clinical Practice 2477  
*Elena Hinz, Christine Knoll, Christian Lücht, Lina Mosch, Akira Poncette and Felix Balzer*

Preliminary Comparative Analysis of Kenya's and South Africa's Digital Health Strategies in Relation to the WHO Global Digital Health Strategy <i>Marlene Achenbach, Henrik Hülsmann, Walter Swoboda and Felix Holl</i>	2479
Virtual Reality to Implement Acceptance and Commitment Therapy: A Pilot Study <i>Francesco Giuliani, Clara de Gennaro, Giuseppina Iannacone, Grazia D'Onofrio, Nicola di Viesti, Raffaella Rita Latino, Giuseppe d'Orsi, Daniele Lombardo, Marco Lombardo, Daniela Stornaiuolo, Santina Miracolini and Giovambattista Presti</i>	2481
Legal Framework and Practical Challenges of Secondary Use of Medical Data in Japan <i>Mayumi Yoshida, Ryuichi Yamamoto and Katsuya Tanaka</i>	2483
Factors That Impact In-Patients Use of an App: An Exploratory Study <i>Maria Flash, Trudi Aspden, Kim Brackley, Amy Chan, Tíreé MacDonald and Michelle Honey</i>	2485
Agent-Based Model for Temperature and Precipitation-Dependent Population Dynamics of <i>Aedes vexans</i> <i>Alexandra Schwaiger, Marco Schweitzer, Werner O. Hackl, Sabrina Neururer, Hasan Taha and Bernhard Pfeifer</i>	2487
Utilizing Routine Care Data of Rare Diseases: Challenges, Chances and Call for Collaboration <i>Miriam Hübner, Marco Schaarschmidt, Harisa Muratovic, Claudia Finis, Elisabeth Nyongui, Dagmar Krefting, Jana Zschüntzsch, Josef Schepers and Richard Röttger</i>	2489
Caregiver Connect: A Mobile Application to Reduce Stress Among Unpaid Dementia Caregivers <i>Maggie Beach and Arshia Khan</i>	2491
Bridging Data and Behavior in Homecare: Personalized Routine Modelling and Anomaly Interpretation <i>Raja Omman Zafar and Yves Rybarczyk</i>	2493
Context-Free Grammar-Guided Generation of FHIR Resources Using Large Language Models <i>Johann Frei and Frank Kramer</i>	2498
Challenges of Ontology-Based Concept Normalization for Deep Phenotyping in Rare Skin Diseases <i>Pauline Bataille, Carole Faviez, Xiaomeng Wang, Nesrine Bannour, Marc Vincent, Christine Bodemer and Nicolas Garcelon</i>	2503
Digital Health Tool Usability and Redesign: Preliminary Scoping Review Findings <i>Liesbeth van den Berg, Linda Peute and Thomas Engelsma</i>	2509
Towards Real-Time Decision Support with LIVIA: Live-Streaming Infrastructure for Vital Sign Inference and Analytics <i>René Schmiedler, Elias Grünewald and Felix Balzer</i>	2511

The Essential Components and Critical Conditions for Success in a Learning Health System in Oncology	2513
<i>Kees C.W.J. Ebben, Matthijs Sloep and Jurrian van der Werf</i>	
Robustness of Healthcare ML Under Data Quality Degradation: A Dimension-Wise Analysis on MIMIC-IV	2518
<i>Nour Idris Pacha, Saber Aloui, Asma Rabaoui Antony Escudie and Jérémie Riou</i>	
Author Index	2520

# Sub-Phenotyping of Pediatric Celiac Disease with Topological Data Analysis

Daniele Pala<sup>a,1</sup>, Giuseppe Albi<sup>b</sup>, Valentina Brembilla<sup>a</sup>, Erika Lenzi<sup>a</sup>, Emanuele Medolago<sup>a</sup>, Chiara Sirtoli<sup>a</sup>, and Arianna Dagliati<sup>b</sup>

<sup>a</sup>*Dept. of Management, Information and Production Engineering, University of Bergamo, Italy*

<sup>b</sup>*Dept. of Electrical, Computer and Biomedical Engineering, University of Pavia, Italy*

**Abstract.** Celiac Disease (CD) is an autoimmune disorder triggered by gluten ingestion in genetically susceptible individuals. Its heterogeneous presentation, especially in pediatric patients, limits the effectiveness of current symptom-based classifications such as the Oslo definitions. This study proposes a framework based on Topological Data Analysis (TDA) to identify new, clinically meaningful sub-phenotypes of pediatric CD. We used a multicentric dataset of over 3,000 children. Compared with standard clustering (DBSCAN, Agglomerative, K-Medoids), our TDA Mapper revealed stable, interpretable communities reflecting serological and clinical patterns. Results indicate that serology, histology, and comorbidities jointly define distinct pediatric phenotypes, supporting data-driven approaches for precision medicine in CD.

**Keywords.** Topological Data Analysis, Computational Phenotyping, Celiac Disease

## 1. Introduction

Celiac Disease (CD) affects about 1% of the global population, with higher prevalence among females. It results from an autoimmune response to gluten, mediated by HLA-DQ2/DQ8 genotypes and antibodies such as tissue transglutaminase (tTG-IgA) and anti-endomysium (EMA). CD is diagnostically challenging due to variable gastrointestinal and extraintestinal manifestations, especially in children. Current classifications, particularly the Oslo definitions, group patients based on symptoms into classical, non-classical, and subclinical categories [1]. However, clinical experience shows significant overlap and heterogeneity, suggesting the need for new, data-driven phenotypes, or sub-phenotypes, that integrate laboratory, histological, and comorbidity information. In this study, we use a TDA Mapper pipeline [2] for the sub-phenotyping of pediatric CD. TDA Mapper [3] is a topological-based algorithm which has already proved to be able to reveal hidden structures in biomedical data [4], and has already been successfully employed for the computational phenotyping of different diseases.

## 2. Dataset and Methods

We used a multicentric dataset of 3,241 pediatric CD patients (0–18 years); after preprocessing and imputation, 2,922 cases and 39 features were retained. Variables

---

<sup>1</sup> Corresponding Author: Daniele Pala, daniele.pala@unibg.it.

included demographics, serology (IgA, EMA, HLA), histology (Corazza), symptoms, and comorbidities. Missing data were handled through clinically informed imputation, and categorical variables were encoded for analysis.

To handle mixed data types, Gower distance was used as the distance measure. Dimensionality reduction was performed with Principal Component Analysis (PCA), Multidimensional Scaling (MDS), and t-distributed stochastic neighbor embedding (t-SNE). We compared the results obtained with the TDA Mapper pipeline implemented in pheTDA [2] to four clustering techniques—K-Medoids, Agglomerative Hierarchical clustering, Hierarchical Density-Based Spatial Clustering of Applications with Noise (HDBSCAN) and DBSCAN, by using the Silhouette coefficient. Logistic regression was implemented for feature ranking, highlighting the most predictive clinical markers.

### 3. Results and Conclusion

Traditional clustering methods produced limited results. DBSCAN and HDBSCAN either merged most patients into a single group or produced numerous micro-clusters. Hierarchical and K-Medoids clustering yielded low silhouette values (<0.5) and clinically unbalanced groups. After dimensionality reduction, PCA improved separability, revealing two dominant data regions corresponding to serological status. Patients with high IgA and positive EMA clustered distinctly from those with negative serology.

TDA Mapper produced a more clinically informative structure, identifying seven groups divided into the same two large branches found by the other algorithms, but with sub-branches that captured patterns such as greater histological atrophy and complication risk, growth delay, anemia, autoimmune, and neurological comorbidities. Sankey analysis showed that many “Silent” or “Minor” Oslo categories re-clustered within serology-positive communities, revealing underappreciated clinical risk. Logistic regression confirmed IgA, EMA, and HLA positivity as dominant features, while growth delay and autoimmune diseases were secondary but discriminative.

Overall, TDA outperformed traditional clustering, enabling precision phenotyping and showing that this framework could support clinicians in differentiating silent from high-risk patients, optimizing diagnostic processes and improving patients monitoring.

### References

- [1] J.F. Ludvigsson, D.A. Leffler, J.C. Bai, F. Biagi, A. Fasano, P.H.R. Green, M. Hadjivassiliou, K. Kaukinen, C.P. Kelly, J.N. Leonard, K.E.A. Lundin, J.A. Murray, D.S. Sanders, M.M. Walker, F. Zingone, and C. Ciacci, The Oslo definitions for coeliac disease and related terms, *Gut*. **62** (2013) 43–52.
- [2] G. Albi, A. Gerbasi, M. Chiesa, G.I. Colombo, R. Bellazzi, and A. Dagliati, A Topological Data Analysis Framework for Computational Phenotyping, in: J.M. Juarez, M. Marcos, G. Stiglic, and A. Tucker (Eds.), *Artificial Intelligence in Medicine*, Springer Nature Switzerland, Cham, 2023: pp. 323–327.
- [3] G. Singh, F. Memoli, and G. Carlsson, *Topological Methods for the Analysis of High Dimensional Data Sets and 3D Object Recognition*, The Eurographics Association, 2007.
- [4] M. Nicolau, A.J. Levine, and G. Carlsson, Topology based data analysis identifies a subgroup of breast cancers with a unique mutational profile and excellent survival, *Proceedings of the National Academy of Sciences*. **108** (2011) 7265–7270.