



ICC AI 2024

Maximizing Clinical Impact of Algorithmic Innovation (AI) in Critical Illness: Artificial Intelligence From Academia & Industry to Government

Co-hosted by the Uniformed Services University with support from HJF
Sponsored by *Nihon Kohden Digital Health Solutions, LLC*

Wed, 4 Sep	
8:30 - 9:00	Opening Ceremony
9:00 - 10:00	Keynote Improving Outcomes through AI and Human Machine Teaming Suchi Saria, Bayesian Health
Session 1: Evaluation and Deployment Approaches for ML-based Clinical Applications Chair: Vitaly Herasevich, co-Chair: Robert Stevens	
10:00 - 10:30	<i>Health Information Technology Evaluation: How to prove that it works.</i> Vitaly Herasevich, Mayo Clinic
10:30 - 11:00	<i>Bringing AI to the Bedside: Implementation of Machine Learning Applications in Critical Care</i> Ankit Sakhuja, Mount Sinai
11:00 - 11:30	<i>The AI Value Proposition in Intensive Care: Strategies for Real-world Implementation</i> Robert Stevens, Johns Hopkins
11:30 - 12:00	Panel Discussion
12:00 - 12:30	Abstract Session A1 <i>Elucidating dynamic signatures utilizing longitudinal transcriptomics in sepsis</i> <u>Deborah A. Striegel</u> ¹ , Mehran Fazli ¹ , Josh Chenoweth ¹ , Danett K. Bishop ² , Danielle V. Clark ¹ ¹ Austere Environments Consortium for Enhanced Sepsis Outcomes (ACESO), Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc., Bethesda, MD, USA. ² DoD Infectious Diseases Directorate, Naval Medical Research Command, USA. <i>Cardiac arrest classification using large PPG foundation model representations</i> <u>Saurabh Kataria</u> ¹ , Jiaying Lu ¹ , Ran Xiao ¹ , Timothy Ruchti ² , Matthew Clark ² , Jules Bergmann ² , Xiao Hu ¹ ¹ Center for Data Science, Nell Hodgson Woodruff School of Nursing, Emory University, Atlanta, USA. ² Nihon Kohden Digital Health Solution, Inc, USA <i>Optimal Timing for Renal Replacement Therapy in Critically Ill Patients Using Reinforcement Learning Algorithms</i> <u>Lorenz Kapral</u> ^{1,2,3} , Mohammad Mahdi Azarbeik ³ , Richard Weiss ³ , Razvan Bologheanu ^{1,2} , Clemens Heitzinger ³ , Oliver Kimberger ^{1,2} ¹ Ludwig Boltzmann Institute Digital Health and Patient Safety, Austria. ² Department of Anaesthesia, Intensive Care Medicine and Pain Medicine, Medical University of Vienna, Austria. ³ Department of Informatics, Technical University of Vienna, Austria
12:30 - 14:00	Lunch break and poster viewing

Session 2: Data assimilation for Mechanistic Models of Physiology - From Theory to Clinical Impact

Chair: David Albers, co-Chair: Manuela Ferrario

- 14:00 - 14:30 *Model-based personalized glycemic management for clinical decision support*
Melike Sirlanci Tuysuzoglu, University of Colorado
- 14:30 - 15:00 *Learning glucose dynamics from real world Type 1 Diabetes data: leveraging qualitative and quantitative expert knowledge*
Matthew E. Levine, Broad Institute of MIT/Harvard
- 15:00 - 15:30 *Aligning computational models with human reasoning in diagnostic and treatment decisions*
Lena Mamykina, Columbia University

15:30 - 16:00

Abstract Session A2

Modeling Organ Crosstalk and Cellular Adaptation In Response to Clinical Intervention During Multiple Organ Dysfunction Syndrome

Stefanos Papadopoulos¹, Robert S. Parker¹, Gilles Clermont¹

¹University of Pittsburgh, Pittsburgh, United States of America.

Control-Oriented Predictions of Candidate Coagulation Protein Therapies for Invasive Pulmonary Aspergillosis
Amanda E. Shick¹, Luis Sordo Vieira², Borna Mehrad², Amor A. Menezes¹

¹Department of Mechanical and Aerospace Engineering, University of Florida, USA. ²Division of Pulmonary, Critical Care and Sleep Medicine, University of Florida, USA.

Intertwined roles for GDF-15, HMGB1, and MIG/CXCL9 in Pediatric Acute Liver Failure

Ruben Zamora^{1,2,3}, Jinling Yin¹, Derek A. Barclay¹, James E. Squires⁴, Yoram Vodovotz^{1,2,3}

¹Department of Surgery, University of Pittsburgh, Pittsburgh, USA. ²Center for Inflammation and Regenerative Modeling, McGowan Institute for Regenerative Medicine, Pittsburgh, USA. ³Pittsburgh Liver Research Center, University of Pittsburgh, Pittsburgh, USA; ⁴Department of Pediatrics, University of Pittsburgh, Pittsburgh, USA.

16:00 - 18:00

SCAI Business Meeting (all attendees)

Thu, 5 Sep

8:00 - 9:00

Poster Viewing

9:00 - 10:00

Keynote

Artificial Intelligence in Critical Care: Perspectives as Investigator and as Editor.

Timothy Buchman, Emory University

Session 3: Data: Collection, Quality, Harmonization and Benchmarking

Chair: Seth Schobel, co-Chair: Gamze Gursoy

- 10:00 - 10:30 *Moving Towards Trust, Validation and Generalizability in Clinical AI*
Sean Manion, AI MINDSystems Foundation
- 10:30 - 11:00 *Designing Patient-facing, Personalized, and Trustworthy Biomedical Real-time AI Tools*
Sage Arbor, Duke Clinical Research Institute
- 11:00 - 11:30 *Observational Data Transformation & Quality Implementing the OMOP Common Data Model*
Davera Gabriel, Evidentli
- 11:30 - 12:00 Panel Discussion

12:00 - 12:30

Formal Poster Presentations

12:30 - 14:00

Lunch break and poster viewing

Session 4: Decision Support that works

Chair: Steve Rees, co-chair: Alan Morris

14:00 - 14:30 *We are Irrational Humans – The Need for Decision Support*

Alan Morris, University of Utah

14:30 - 15:00 *The Intersection of Replicable Decision Support, Interoperability, and the Potential Benefit of Federal Incentives for Digitally Tracked Quality Measures*

Chris Horvat, University of Pittsburgh

15:00 - 15:30 *Vulnerability of Knowledge Captured on Local Platforms, the need for managed, freely available, knowledge bases.*

Scott Evans, University of Utah

15:30 - 16:00

Abstract Session A3

Wave Power Analysis to assess cardiovascular alterations in sepsis

Marta Carrara¹, Diletta Guberti¹, Riccardo Asnaghi^{1,2}, [Manuela Ferrario](#)¹

¹Politecnico di Milano, Dept. Electronics, Information, and Bioengineering (DEIB), Milano, Italy. ²Università degli Studi di Milano, Dept. Clinical Sciences and Community Health, Milano, Italy.

Characterization of arterial stiffness alterations following cardiac arrest

Diletta Guberti¹, Riccardo Asnaghi^{1,2}, Marta Carrara¹, Aurora Maiocca², Giuseppe Ristagno^{2,3}, [Manuela Ferrario](#)¹

¹Dept. Electronics, Information, and Bioengineering (DEIB), Politecnico di Milano, Milano, Italy. ²Università degli Studi di Milano, Milano, Italy. ³Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Milano, Milano, Italy

19:00-22:00

Banquet

MoCo's Founding Farmers, 12505 Park Potomac Avenue, POTOMAC, MD 20854

Fri, 6 Sep

8:00 – 9:00

Poster Viewing

9:00 - 10:00

Keynote

Patients' Rights in the Time of AI

Barbara Evans, University of Florida

Session 5: Fusing Model-Driven and Data Approaches

Chair: Aldo Faisal, co-Chair: Soojin Park

10:00 - 10:30 *Foundational Model for Physiologic Data*

Xiao Hu, Emory University

10:30 - 11:00 *Translational Insights into the Complexity of Acute Illness from the Fusion of Data-driven and Mechanistic Modeling*

Yoram Vodovotz, University of Pittsburgh

11:00 - 11:30 *Pseudo-Bayesian Approach to Model-based Intracranial Pressure Estimation*

Thomas Heldt, MIT

11:30 - 12:00 Panel Discussion

12:00 – 14:00

Lunch break and poster viewing

14:00 - 15:30

Session 6: Regulatory and Normative Aspects of AI in Clinical Decision Support

Chair: Chris Scully; co-chair: Gilles Clermont

14:00 - 14:30 *The Evolving Regulatory Environment: The US Perspective*

Chris Scully, FDA

14:30 - 15:00 *The Evolving Regulatory Environment: A European Perspective*

Sven Zenker, University of Bonn

15:00 - 15:30 *Translating AI Technology for Use in Clinical Applications*

Laura Brosch, USU

15:30 - 16:00

Concluding remarks and prize award ceremony
