13th International Workshop on Medical Cyber Physical Systems and Internet of Medical Things

Hosted at Cyber-Physical Systems and the Internet-of-Things Week 2023
https://mcps-iomt.github.io/2023/
May 9, 2023 - San Antonio, Texas, USA

Call for Papers

Medical Cyber-Physical Systems (CPS) encompass a new generation of smart medical systems that integrate human, cyber, and physical elements in closed-loop control. They aim to improve patient care by enabling the delivery of advanced therapies and complex surgeries. An example is the artificial pancreas that allows people with diabetes to better manage their condition. Another example is medical robotic systems, which allow doctors to perform minimally-invasive surgeries that were not possible before. Such systems may be integrated into the Internet of Medical Things (IoMT) which consist of connected infrastructures of medical devices, mobile and web applications, and other health services. Designing safe and effective Medical CPS and IoMT involves the work of a multi-disciplinary team of engineers, medical domain experts, and human factors specialists. This work needs to be supported by rigorous development processes and tools, as substantial evidence needs to be documented and integrated to justify design choices and ease the review process mandated by regulation.

The objectives of the Medical Cyber-Physical Systems (MCPS) and Internet of Medical Things workshop 2021 are to provide opportunities for researchers, industrial practitioners, caregivers, and government agencies to demonstrate innovative development methods and tools, present experience reports, discuss open challenges, and explore ideas for future development of Medical CPS and the Internet of Medical Things. Contributions are welcome on all aspects of system development, including specification, design, analysis, implementation, documentation, and certification of Medical CPS. Demonstrations of existing tools for design and analysis of Medical CPS are also encouraged.

The 10th MCPS workshop will be a one-day virtual event co-located with CPS-IOT Week 2023. Topics of interest include, but are not limited to, the following:

- ***Foundations for Integration of Medical Device Systems/Models:*** Component-based technologies for accelerated design and verifiable system integration, Systems of systems, Medical devices plug-and-play to support interoperability of heterogeneous systems
- ***Enabling Technologies for Future Medical Devices:*** Implantable regulatory devices, networked biosensors, tele-surgery, robotic surgery, physiologic signal QoS (Quality of Service), Medical CPS in developing countries
- ***Distributed Control & Sensing of Networked Medical Device Systems:*** Robust, verifiable, fault-tolerant control of uncertain, multi-modal systems
- ***Medical Device Plug-and-Play Ecosystem:*** Requirements and emerging standards for supporting interoperability in the clinical environment, including "black box" data recording, device authorization, and data security

- ***Human-Machine Interfaces:*** Identification of use-related safety requirements, model-based analysis of medical user interface design, user studies involving medical devices, modelling and analysis of use-errors with medical devices
- ***Patient Modeling & Simulation:*** Large scale, high fidelity organ/patient models for design & testing
- ***Embedded, Real-Time, Networked System Infrastructures for High Confidence Medical Devices:*** Architecture, platform, middleware, resource management, QoS (Quality of Service), Dynamic interoperation, including plug-and-play operation
- ***High Confidence Medical Device Software Development & Assurance:*** Care-giver requirements solicitation and capture, design and implementation, V&V (Verification and Validation), Heterogeneity in environment, architecture, platforms in medical devices
- ***Internet of Medical Things:*** Mobile medical apps, data management, security, logging, forensics, and privacy
- ***Machine Learning and Data Science:*** big data, predictive models, decision support, data analytics and data mining for medical applications and systems
- ***Medical Practice-Driven Models and Requirements:*** User-centric design, risk understanding, and use/misuse modeling in medical practice, management of failures in a clinical environment, modeling of operational scenarios, including medical devices, care-givers, patients
- ***Certification of Medical Devices:*** Quantifiable incremental certification of medical devices and interoperable medical systems, role of design tools and COTS (Commercial Off-The-Shelf) components, challenges with self-adaptive medical systems

Paper Submission

Submissions are due February 7th, 2023. We are accepting the following types of submissions:

- **Regular Papers** (6 pages max, including references). work-in-progress and position papers encouraged, work must be novel and unpublished and unsubmitted elsewhere. Regular papers will be included in the official proceedings.
- **Posters / Demos** (1 page, including references). Poster/demo abstracts will be included in official proceedings. Authors will overview posters and demos in a lightning round session prior to the poster/demo session. All poster and demo submissions should include "Poster/Demo:" at the beginning of the title.
- **Abstracts** (250 words max). Abstract submissions are new this year. Abstracts can be previously published work and **WILL NOT** be included in official proceedings (only posted on the MCPS-IoMT website). The purpose of abstract submissions is to present previously published MCPS/IoMT work at the workshop without violating copyright/dual submission policies. Abstracts are intended to encourage participation in the workshop and grow the MCPS/IoMT community. All abstract submissions should include "Abstract:" at the beginning of the title.

Please use Easy Chair for Submissions: https://easychair.org/conferences/?conf=mcpsiomt2023

Authors should prepare their papers using LaTeX and the ACM style file (SIGCONF). Submissions must be original and should not have been published previously or be under consideration for publication while being evaluated for this workshop. Reviews will be single blind.

Accepted Regular papers (6 pages) and Posters/demo papers (1 page) will be included in the CPS week proceedings.

Important Dates

Regular Papers, Posters/Demos, and Abstracts	February, 7th 2023
Author notification	March 1, 2023
Camera ready versions due (hard deadline)	March 15, 2023
MCPS-IoMT Workshop	May 9, 2023

Organizing Committee
Workshop Co-Chairs
- Miroslav Pajic, Duke University, USA
- Amanda Watson, University of Pennsylvania, USA
- James Weimer, Vanderbilt University, USA