

5th Workshop on Medical Cyber-Physical Systems

MCPS'14, April 14th, 2014, Berlin, Germany

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■ Preface

This volume contains the proceedings of the *5th Medical Cyber-Physical Systems Workshop: Medical Device Interoperability, Safety, and Security Assurance* held as part of CPSWeek'14 in Berlin, Germany, on April 14, 2014.

As co-chairs of this year's workshop, we are delighted to introduce the exciting programme of scientific papers to the interested reader. Programmable medical devices, for example infusion pumps, glucose monitors, cardiac pacemakers and defibrillators, must be safe, secure and dependable, as otherwise human lives are put at risk. There is a growing need for methodologies, standards and regulatory procedures that necessarily have to involve all the stakeholders across academia and industry.

The workshop series was motivated by the idea to bring together the HCMDSS (High Confidence Medical Devices, Software, and Systems) and MD PnP (Medical Device Plug-and-Play Interoperability) communities of medical device specialists (researchers, developers, clinicians, regulators and policy makers) from clinical environments, industry, research laboratories, academia and government. The hope was that joint meetings would accelerate the development of science, technology and practice to overcome crucial challenges facing the design, manufacture, certification and use of medical devices. The workshop series provides a regular forum for the presentation of research and development covering all aspects of high integrity medical devices, software and systems, which is essential to support innovative, networked medical device systems to improve safety and efficiency in health care.

The first three workshops in the series were called the Joint Workshop on HCMDSS/MDPnP. Since 2013, the workshop title was changed to Medical CPS to broaden its scope. The previous four workshops were as follows:

- The first Joint Workshop on HCMDSS/MDPnP: Improving Patient Safety through Medical Device Interoperability and High Confidence Software, Cambridge, MA, June 25–27, 2007.
- The second Joint Workshop on HCMDSS/MDPnP, CPSWeek 2009, San Francisco, April 16, 2009.
- The third Joint Workshop on HCMDSS/MDPnP, CPSWeek 2011, Chicago, April 11, 2011.
- The fourth Medical Cyber-Physical Systems Workshop: Medical Device Interoperability, Safety, and Security Assurance, CPSWeek 2013, Philadelphia, April 8, 2013.

The programme of this year's workshop covers a broad range of themes relevant to the development, verification and practical application of medical devices, and includes a topical keynote lecture by Prof. Dr. Thomas Stieglitz, Laboratory for Biomedical Microtechnology, University of Freiburg, Germany, entitled "Neural Implants – about science and fiction". The remainder of the programme is composed of 8 full and 5 short papers selected from 20 submissions, as well as 5 poster presentations. Among the themes covered, we would like to highlight aspects of novel methodology that is being put forward, and specifically user interface design for hazard analysis, application of runtime verification to ensure safety and modelling of reconfigurability of ultrasonic medical devices. The medical applications featuring in the programme include the cardiovascular system, laser tracheotomy and artificial pancreas.

This workshop would not have been possible without the support of the Steering Committee, and particularly Prof. Insup Lee who offered valuable advice. We are very grateful to

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Editors: Volker Turau, Marta Kwiatkowska, Rahul Mangharam, and Christoph Weyer

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the Programme Committee members and additional reviewers for their timely and rigorous reviewing.

As a final note, we hope that the participants of the workshop and readers of the proceedings volume will find the programme exciting, and that the meeting stimulates closer collaboration between the stakeholders in this important and fast moving field, and eventual progress towards safe, secure and dependable medical devices.

March 2014

Marta Kwiatkowska
Volker Turau
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