

## Introduction to IT Architectures and Applications in Healthcare Environments Minitrack

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This year the “IT Architectures and Applications in Healthcare Environments” minitrack has accepted a total of eleven papers, which are diverse and very indicative of technological impact on modern healthcare software applications.

The paper “A Business Process Management Approach to Perioperative Supplies/Instrument Inventory and Workflow” is based on a 10 year longitudinal study of a large teaching US hospital, which identifies quality and quantity business analytics used to improve perioperative efficiency and effectiveness across patient quality of care. Another study, conducted in Austria, and presented in the paper entitled “Factors of Access Control Management in Electronic Healthcare: The Patients’ Perspectives” has revealed that patients have varying conceptions regarding privacy and the authors advocate the integration of access control factors to satisfy individual information requirements. The paper on “Decision Support in Evaluating the Impact of Mental Disorders on Work Ability” is from Finland and illustrates a systematic process workflow and clinical decision support system, implemented in South Karelia district, which standardized the work ability evaluation process in the field of mental health.

The next three papers are focused on the role of ontologies in healthcare, but each of them use ontologies for different purposes and create different software solutions applicable in healthcare. “The ASeCS: Assistive Self-Care Software Architectures for Delivering Services in Self-Care Homes” introduces an architectural solution for software applications used in remote patient monitoring. The authors advocate to embed computations with SWRL enabled OWL ontologies within a specific architectural layer, which would enable an ad-hoc decision making in patient monitoring. The paper “Automating the Integration of Clinical Studies into Medical Ontologies” illustrates how the proposed method, which generates links between risk factors, defined in formal medical ontologies, and a questions and result data obtained from the longitudinal clinical

studies can connect medical expert concepts and hypothesis with information contained in clinical studies. The paper “A Guiding Framework for Ontology Reuse in the Biomedical Domain” also uses a formal, cross-domain ontology in dental healthcare. However, the authors’ motivation is to use the proposed framework for developing any biomedical ontology that needs to reuse known sources such as SYNOMED.

The paper “Analyzing and Modeling Medical Data on Distributed Computing Infrastructures” is from the EU and describes how the CGI approach can be used for analysis and simulation in Health Care, by utilizing the sharing of interoperable workflows for large-scale scientific simulations. The paper on “Bridging Electronic Health Record Access to the Cloud” is from the US and lays out a comprehensive structure that healthcare providers can easily use to integrate their EHRs with the Cloud for identity validation, while meeting compliance guidelines for security and privacy. The authors have implemented the proposal in a large regional hospital in a number of pilots and proof of concept projects yielding immediate and tangible improvements. The paper on “A Smartphone-based System for Population-scale Anonymized Public Health Data Collection and Intervention” introduces and evaluates a system for providing aggregate population health data while utilizing smartphone capabilities and maintaining anonymity and privacy.

The last two papers in the minitrack cover two interesting types of software application in healthcare. The first one entitled “A Neuro-fuzzy Approach to Bad Debt Recovery in Healthcare” evaluates the effectiveness of an adaptive neuro-fuzzy inference in classifying bad debt in the healthcare context. The second paper “Pervasive Mobile Assistance System for Health and Fitness Scenario” describes an implemented personal health system for self-motivated and self-controlled disease management, which is an application suitable for mobile and wireless devices.