

Big Data on Healthcare Application Minitrack

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The recent confluence of new technologies and data-intensive research methodologies offers new research challenges for traditional research. High-performance computing, client-cloud architecture, broadband networks, personal devices and sensors, multimedia, and multimodal data pervade our society. This creates an unprecedented explosion in data volume in many forms, that are often described as "Big Data." The fundamental definitions of Big Data include three V's: (1) Volume – incredible amounts of data in computing scale, (2) Velocity – speed of data creation, and (3) Variety – data beyond the traditional format, e.g., voice or image. The definitions were recently extended to five V's by supplementing with Veracity and Value: Veracity – quality and trustworthiness of the data; and Value – interpretation and application of healthcare data. Big Data applications are important to visualize the political and social needs and generate new knowledge for decision-making. Social networks, digital behavior, and data analytics on health are the emerging research areas.

This minitrack broadly covers a variety of research topics on digital health, including mobile platforms and wearable devices applied on health monitoring, artificial intelligence and machine learning application on health data, telemedicine for patient management, the impact of environmental and climate changes for health, big-data architecture and cloud computing for health systems, data capturing techniques on personal health records, image processing and voice recognition for data extraction, data analytics on open source health data, data simulation for scenario modeling on the health system, and feature selection in genomic data. We aim to provide an international and interdisciplinary forum dedicated to exploring the Big Data application in healthcare, as well as to provide an opportunity for current research that examines large-scale healthcare data using scalable data analytics.

There are eight research papers presented in this minitrack, starting with "Predicting Unplanned Hospital Readmissions using Patient Level Data" by Balan U et al., and followed by "Early Diagnosis of Mild Cognitive Impairment with 2-Dimensional Convolutional Neural Network Classification of Magnetic Resonance Images" by Heising and Angelopoulos. The third paper is contributed by Buettner et al. entitled "Machine Learning Based Diagnostics of Developmental Coordination Disorder using Electroencephalographic Data". The fourth paper is "A Multi-view Classification Framework for Falls Prediction: Multiple-domain Assessments in Parkinson's Disease" by Huang et al. The fifth paper is "High-Performance Detection of Corneal Ulceration Using Image Classification with Convolutional Neural Networks" by Gross et al. The sixth paper is "The Application of Image Recognition and Machine Learning to Capture Readings of Traditional Blood Pressure Devices: A Platform to Promote Population Health Management for Cardiovascular Diseases Prevention" by Lee et al. Finally, the minitrack is concluded by "Warfarin Dose Estimation on High-dimensional and Incomplete Data" by Wang et al. and "A Comparative Evaluation of Machine Learning Deployment Approaches in Real Term Environments using the Example of the Detection of Epileptic Seizure" by Houta.