# 2012 IEEE Second Conference on Healthcare Informatics, Imaging and Systems Biology

## HISB 2012

### Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welcome Message from the General Chair</td>
<td>xi</td>
</tr>
<tr>
<td>Organizing Committee</td>
<td>xii</td>
</tr>
<tr>
<td>Reviewers</td>
<td>xvii</td>
</tr>
</tbody>
</table>

## Oral Presentations

- **Using MapReduce for Large-Scale Medical Image Analysis**
  - Dimitrios Markonis, Roger Schaer, Ivan Eggel, Henning Müller, and Adrien Depeursinge
  - Page 1

- **Preparing Electronic Health Records Data for Comparative Effectiveness Studies**
  - Michael G. Kahn, Lisa M. Schilling, Bethany M. Kwan, Aidan Bunting, Chris Uhrich, and Colleen Singleton
  - Page 2

- **Dynamic Task Optimization in Remote Diabetes Monitoring Systems**
  - Myung-kyung Suh, Jonathan Woodbridge, Tannaz Moin, Mars Lan, Nabil Alshurafa, Lauren Samy, Bobak Mortazavi, Hassan Ghasemzadeh, Alex Bui, Sheila Ahmadi, and Majid Sarrafzadeh
  - Page 3

- **Clinical Decision Support for Colonoscopy Surveillance Using Natural Language Processing**
  - Kavishwar Wagholikar, Sungwhan Sohn, Stephen Wu, Vinod Kaggal, Sheila Buehler, Robert Greenes, Tsung-Teh Wu, David Larson, Hongfang Liu, Rajeev Chaudhry, and Lisa Boardman
  - Page 12

- **Knowledge-Based Biomedical Word Sense Disambiguation: An Evaluation and Application to Clinical Document Classification**
  - Vijay N. Garla and Cynthia Brandt
  - Page 22

- **Aggregated Indexing of Biomedical Time Series Data**
  - Jonathan Woodbridge, Bobak Mortazavi, Majid Sarrafzadeh, and Alex A.T. Bui
  - Page 23
Predicting Complications of Percutaneous Coronary Intervention Using
a Novel Support Vector Method .................................................................31
   Gyemin Lee, Hitinder S. Gurm, and Zeeshan Syed

Using Natural Language Processing and the Electronic Health Record
for Appendicitis Risk Stratification ..............................................................32
   Louise Deleger, Holly Brodzinski, Haijun Zhai, Qi Li, Todd Lingren,
   Eric Kirkendall, Evaline Alessandrini, and Imre Solti

SPOT the Drug! An Unsupervised Pattern Matching Method to Extract Drug
Names from Very Large Clinical Corpora ..................................................33
   Anni Coden, Daniel Gruhl, Neal Lewis, Michael Tanenblatt, and Joe Terdiman

Demographics Identification: Variable Extraction Resource (DIVER) ....................40
   Alexander Hsieh, Son Doan, Michael Conway, Ko-Wei Lin, and Hyeoneui Kim

An Interactive Image Retrieval Framework for Biomedical Articles Based
on Visual Region-of-Interest (ROI) Identification and Classification ...................50
   Mahmudur Rahman, Daekeun You, Matthew S. Simpson, Sameer K. Antani,
   Dina Demmer-Fushman, and George R. Thoma

Ontological Approach for the Management of Informed Consent Permissions ..........51
   Maria Adela Grando, Aziz Boxwala, Richard Schwab, and Neda Alipanah

A Robust Feature Selection Method for Novel Pre-microRNA Identification
Using a Combination of Nucleotide-Structure Triplets ..................................61
   Petra Stepanowsky, Jihoon Kim, and Lucila Ohno-Machado

Enhancing Twitter Data Analysis with Simple Semantic Filtering: Example
in Tracking Influenza-Like Illnesses ...........................................................62
   Son Doan, Lucila Ohno-Machado, and Nigel Collier

Automatically Extracting Sentences from Medline Citations to Support
Clinicians' Information Needs ......................................................................72
   Siddhartha Jonnalagadda, Guilherme Del Fiol, Richard Medlin, Charlene Weir,
   Marcelo Fiszman, Javed Mostafa, and Hongfang Liu

A Comparison of Computational Approaches in the Molecular Identification
of Pathogenic Organisms ............................................................................73
   Dhundy R. Bastola, Scott McGrath, Sanjukta Bhawmick, and Ishwor Thapa

Designing Clinical Data Presentation in Electronic Dental Records Using
Cognitive Task Analysis Methods ..................................................................74
   Thankam P. Thyvalikakath, Michael P. Dziabiak, Raymond Johnson,
   Miguel H. Torres-Urquidy, Jonathan Yabes, and Titus K. Schleyer

Automated Human Embryonic Stem Cell Detection .........................................75
   Benjamin X. Guan, Bir Bhanu, Prudence Talbot, and Sabrina Lin

A Network Approach for Computational Drug Repositioning ..............................83
   Jiao Li and Zhiyong Lu
Linking Medications and Their Attributes in Clinical Notes and Clinical Trial Announcements for Information Extraction: A Sequence Labeling Approach .................................................. 84
  Qi Li, Haijun Zhai, Louise Deleger, Todd Lingren, Megan Kaiser,
  Laura Stotenborough, and Imre Solti

Azathioprine-Induced Comorbidity Network Reveals Patterns and Predictors of Nephrotoxicity and Neutrophilia ........................................................................................................... 85
  Vishal N. Patel and David C. Kaelber

FSCoMS: Feature Selection of Medical Images Based on Compactness Measure from Scatterplots .......................................................................................................................... 86
  Gabriel Humpire-Mamani, Agma Juci Machado Traina, and Caetano Traina

An Approach for Incorporating Context in Building Probabilistic Predictive Models ......................................................................................................................... 96
  Juan Anna Wu, William Hsu, and Alex A.T. Bui

Cheap, Fast, and Good Enough for the Non-biomedical Domain but is It Usable for Clinical Natural Language Processing? Evaluating Crowdsourcing for Clinical Trial Announcement Named Entity Annotations .............................................. 106
  Haijun Zhai, Todd Lingren, Louise Deleger, Qi Li, Megan Kaiser,
  Laura Stotenborough, and Imre Solti

Ontology-Guided Approach to Retrieving Disease Manifestation Images for Health Image Base Construction ........................................................................................................ 107
  Yang Chen, Xiaofeng Ren, Guo-Qiang Zhang, and Rong Xu

Pre-annotating Clinical Notes and Clinical Trial Announcements for Gold Standard Corpus Development: Evaluating the Impact on Annotation Speed and Potential Bias ........................................................................................................ 108
  Todd Lingren, Louise Deleger, Katalin Molnar, Haijun Zhai,
  Jareen Meinzen-Derr, Megan Kaiser, Laura Stotenborough, Qi Li, and Imre Solti

Posters

Small RNA Sequencing in microRNA Research ......................................................................................................................... 109
  Hsei-Wei Wang

OntoVIP: An Ontology for the Annotation of Object Models Used for Medical Image Simulation .......................................................................................................................... 110
  Bernard Gibaud, Germain Forestier, Hugues Benoit-Cattin,
  Frédéric Cervenansky, Patrick Clarysse, Denis Friboulet, Alban Gaignard,
  Patrick Hugonnard, Carole Lartizien, Hervé Liebgott, Johan Montagnat,
  Joachim Tabary, and Tristan Glatard

Building an Ontology of Phenotypes for Existing GWAS Studies ......................................................................................................................... 111
  Neda Alipanah, Hyeoneul Kim, and Lucila Ohno-Machado

Text Mining for Personal Health Information on Twitter ......................................................................................................................... 112
  Marina Sokolova, Yasser Jafer, and David Schramm
Early Prediction of Potentially Preventable Events in Ambulatory Care
Sensitive Admissions from Clinical Data .............................................................. 124
   Prasanna Desikan, Nisheeth Srivastava, Tamara Winden, Tammie Lindquist,
   Heather Britt, and Jaideep Srivastava

Comparison of Association Rule Mining and Crowdsourcing for Automated
Generation of a Problem-Medication Knowledge Base .................................. 125
   Allison B. McCoy, Dean F. Sittig, and Adam Wright

A Study on Studies: Exploring the Metadata Associated with dbGaP Studies .......... 126
   Karen Truong and Mike Conway

Identifying Provider Counseling Practices Using Natural Language Processing:
Gout Example ........................................................................................................ 127
   Olga V. Patterson, Gail S. Kerr, J. Steuart Richards, Carl A. Nunziato,
   David D. Maron, Richard L. Amdur, and Scott L. DuVall

Privacy-Preserving Biometric System for Secure Fingerprint Authentication ........ 128
   Shuang Wang, Xiaojian Jiang, Lucila Ohno-Machado, Lijuan Cui,
   Samuel Cheng, and Hongkai Xiong

Doubly Penalized LASSO for Reconstruction of Biological Networks ................... 129
   Behrang Asadi, Daniel M. Tartakovsky, Mano Ram Maurya,
   and Shankar Subramaniam

SecUre Privacy-presERving Medical Image CompRessiOn (SUPERMICRO) ........... 130
   Shuang Wang, Xiaojian Jiang, Lucila Ohno-Machado, Lijuan Cui,
   and Samuel Cheng

Detecting Adverse Drug Reactions Using Inpatient Medication Orders
and Laboratory Tests Data .................................................................................. 131
   Mei Liu, Michael E. Matheny, Yonghui Wu, Eugenia R. McPeek Hinz,
   Joshua C. Denny, Jonathan S. Schildcrout, Randolph A. Miller, and Hua Xu

Temporal Relation Extraction from Medical Discharge Summaries ...................... 132
   Emily Silgard, Melissa Tharp, and Rutu Mulkar-Mehta

A Semantic-Web Oriented Representation of Clinical Element Model
for Secondary Use of Electronic Healthcare Data .............................................. 133
   Cui Tao, Guoqiang Jiang, Thomas A Oniki, Robert R. Freimuth,
   Jyotishman Pathak, Qian Zhu, Deepak Sharma, Stanley M. Huff,
   and Christopher G. Chute

Removing Mixture Noise from Medical Images Using Block Matching Filtering
and Low-Rank Matrix Completion ..................................................................... 134
   Nafise Barzigar, Aminmohammad Roozgard, Promode Verma, and Samuel Cheng

The Frequency of ConText Lexical Items in Diverse Medical Texts ....................... 135
   Brian E. Chapman, Wei Wei, and Wendy W. Chapman
Does Domain Knowledge Matter for Assertion Annotation in Clinical Texts? ..................................................136

  Danielle L. Mowery, Pamela W. Jordan, Janyce M. Wiebe,
  Wendy W. Chapman, and Lin Liu

Modelling the Effects of Genetic Changes in Tumour Progression ...............................................................137

  Vanderson Silva, Fabiana Santana, Beatriz Stransky, and Sandro De Souza

A Randomized Response Model for Privacy-Preserving Data Dissemination ..................................................138

  Xiaoqian Jiang, Shuang Wang, Zhanglong Ji, Lucila Ohno-Machado, and Li Xiong

Evaluation of Segmentation Algorithms in CT Scanning ......................................................................................139

  Seemeen Karimi, Xiaoqian Jiang, Pamela Cosman, and Harry Martz

Temporal Analysis of Physicians’ EHR Workflow during Outpatient Visits ......................................................140

  Alan Calvitti, Neal Farber, Yunan Chen, Danielle Zuest, Lin Liu, Kristin Bell,
  Barbara Gray, and Zia Agha

Intra-relation Reconstruction from Inter-relation: miRNA to Gene Expression ................................................141

  Dokyoon Kim, Hyunjung Shin, Je-Gun Joung, Su-Yeon Lee, and Ju Han Kim

Cloud Computing Considerations for Biomedical Applications .........................................................................142

  Richard Rauscher

Privacy Protection in Sharing Personal Genome Sequencing Data ......................................................................143

  XiaoFeng Wang and Haixu Tang

A Task-Based Approach for Large-Scale Evaluation of the Gene Ontology ......................................................144

  Salvatore Loguercio, Erik L. Clarke, Benjamin M. Good, and Andrew I. Su

genegames.org: High-Throughput Access to Biological Knowledge and Reasoning through Online Games ..........................................................145

  Benjamin M. Good, Salvatore Loguercio, Max Nanis, and Andrew I. Su

University of California Research eXchange (UCReX): A Federated Cohort Discovery System .........................146

  Aaron J. Mandel, Michael Kamerick, Douglas Berman, and Lisa Dahm

Annio: A Web-Based Tool for Annotating Medical Images with Ontologies ....................................................147

  Brian E. Chapman, Mona Wong, Claudiu Farcas, and Patrick Reynolds

Improving Online Access to Drug-Related Information ......................................................................................148

  Jiao Li, Ritu Khare, and Zhiyong Lu

A General Purpose Phenotype Algorithm for Venous Thromboembolism Using Billing Codes and Natural Language Processing ..................................................................................149

  Eugenia R. McPeek Hinz, Lisa Bastarache, and Joshua C Denny

Mining Adverse Drug Side-Effects from Online Medical Forums .....................................................................150

  Hariprasad Sampathkumar, Bo Luo, and Xue-wen Chen

Author Index .........................................................................................................................................................151