CURRICULUM VITAE

ELIZABETH S. CHEN

CURRENT POSITIONS

Associate Director of Biomedical Informatics
Assistant Professor of Clinical and Translational Science
Assistant Professor of Medicine – General Internal Medicine
Assistant Professor of Computer Science (*secondary*)

UNIVERSITY ADDRESS

Center for Clinical & Translational Science
University of Vermont
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EDUCATION

1998	**B.S.**	**Computer Science**	Tufts University, Medford, MA
2000	**M.A.**	**Biomedical Informatics** *(Advisor: Kathleen R. McKeown, PhD)*	Columbia University, New York, NY
2002	**M.Phil.**	**Biomedical Informatics** *(Advisor: James J. Cimino, MD)*	Columbia University, New York, NY
2004	**Ph.D.**	**Biomedical Informatics** *(Advisor: James J. Cimino, MD)*	Columbia University, New York, NY

ACADEMIC APPOINTMENTS

2004 – 2007	***Associate Research Scientist***, Department of Biomedical Informatics, Columbia University, New York, NY
2006 – 2007	***Assistant Clinical Director***, Center for Advanced Information Management, Columbia University, New York, NY
2007 – 2008	***Instructor***, Division of General Internal Medicine, Brigham and Women's Hospital, Harvard Medical School, Boston, MA
2009 – pres.	***Associate Director***, Biomedical Informatics Unit, Center for Clinical and Translational Science, University of Vermont, Burlington, VT
2009 – pres.	***Assistant Professor,*** Center for Clinical and Translational Science, University of Vermont, Burlington, VT
2009 – pres.	***Assistant Professor,*** Division of General Internal Medicine, Department of Medicine, University of Vermont, Burlington, VT
2009 – pres.	***Assistant Professor (secondary)***, Department of Computer Science, University of Vermont, Burlington, VT

HOSPITAL APPOINTMENTS

2005 – 2007	***Project Director***, Vigilens Health Monitor*, NewYork-Presbyterian Hospital, New York, NY

2007 – 2008   *Senior Medical Informatician*, Enterprise Clinical Informatics Infrastructure Services, Clinical Informatics Research & Development, Partners HealthCare System, Wellesley, MA

2009 – 2011   *Medical Informatician*, Electronic Health Record Implementation, Fletcher Allen Health Care, Burlington, VT

OTHER PROFESSIONAL POSITIONS

1996   *Assistant to Department Administrator/Interim Business Manager*, Department of Computer Science, Columbia University, New York, NY

1997   *System Administrator*, Department of Computer Science, Columbia University, New York, NY

1998   *Web Coordinator*, Tufts University, Medford, MA

1998 – 1999   *System Administrator*, Department of Computer Science, Columbia University, New York, NY

1999 – 2000   *Graduate Research Assistant*, Department of Computer Science, Columbia University, New York, NY

2000 – 2004   *National Library of Medicine Pre-Doctoral Fellow*, Department of Biomedical Informatics, Columbia University, New York, NY

HONORS AND AWARDS

2000 – 2004   Medical Informatics Pre-Doctoral Training Fellowship, National Library of Medicine, National Institutes of Health

2006   Marquis Who's Who in America

2006   21st Century Achievement Award, Computerworld Honors Program (Columbia University School of Nursing, Nursing PDA Project [MODS-APN], Co-Investigator)

2011   Distinguished Paper Award, AMIA 2011 Annual Symposium

PROFESSIONAL SOCIETIES

2000 – pres. *Member*, American Medical Informatics Association (AMIA)
  2006 – 2011   *Member*, Meetings Committee
  2010 – pres. *Member*, Education Committee
  2012 – pres. *Member*, Publications Committee
  2010 – 2013   *Primary UVM Representative*, Academic Forum

INSTITUTIONAL SERVICE

2002 – 2003   *Senior Student Representative,* Department of Biomedical Informatics, Columbia University, New York, NY

2002 – 2003   *Member*, Graduate Student Advisory Council (GSAC), GradWeb committee, Columbia University, New York, NY

2005 – 2007   *Member*, Joint Clinical Alerts Committee, NewYork-Presbyterian Hospital, New York, NY

2007 – 2008   *Member*, Application Technology Board, Partners HealthCare System, Wellesley, MA

2009 – pres. *Member*, Informatics Committee/Group, Fletcher Allen Health Care, Burlington, VT

2010   *Member*, Business Intelligence Data Management Group, Fletcher Allen Health Care, Burlington, VT

2010 – 2013   *Member*, Faculty Senate Educational & Research Technologies Committee, University of Vermont, Burlington, VT

2010 – pres. *Member*, University-wide Workgroup on Privacy, Information Security and Data Retention, University of Vermont, Burlington, VT

2011 – 2013   *Member*, Committee on Human Research in the Medical Sciences (Institutional Review Board), University of Vermont and Fletcher Allen Health Care, Burlington, VT

TEACHING

1994	**Tutor** (Math and Chemistry), Cambridge Rindge and Latin School, Cambridge, MA
2001	**Teaching Assistant,** G4040 Health Information Systems Architecture, Department of Biomedical Informatics, Columbia University, New York, NY
2002	**Teaching Assistant**, G4060 Evaluation in Medical Informatics, Department of Biomedical Informatics, Columbia University, New York, NY
2004	**Invited Lecture** ("*Mobile Computing in Health Care*"), Internet Integration into Health Care, Downstate Medical Center, State University of New York, New York, NY
2005	**Invited Lecture** ("*MedLEE*"), G4024 Biomedical Text Mining, Department of Biomedical Informatics, Columbia University, New York, NY
2006	**Module Instructor** ("*Knowledge Acquisition and Representation*"), G4002 Theory and Methods in Biomedical Informatics, Department of Biomedical Informatics, Columbia University, New York, NY
2008 (Summer)	**Invited Lecture** ("*Natural Language Processing*"), HPM 512 Medical Informatics, Harvard School of Public Health, Boston, MA
2008 (Fall)	**Invited Lecture** ("*Data, Text, and Web Mining*"), HST 951 Medical Decision Support, Harvard-MIT Health Sciences and Technology, Boston, MA
2009 (Fall)	**Invited Lecture** ("*Natural Language Processing*"), CTS 395 Introduction to Biomedical Informatics, Center for Clinical and Translational Science, University of Vermont, Burlington, VT
2010 (Spring)	**Sole Instructor**, CTS 395 Applications in Biomedical and Health Informatics, Center for Clinical and Translational Science, University of Vermont, Burlington, VT
2010 (Summer)	**Supervisor**, CS 394 Independent Study: Surveying Itemset and Association Rule Mining, Department of Computer Science, University of Vermont, Burlington, VT
2010 (Fall)	**Supervisor**, CS 394 Independent Study: Implementation of Itemset and Association Rule Mining, Department of Computer Science, University of Vermont, Burlington, VT
2010 – pres.	**Coordinator**, Informatics Grand Rounds, Center for Clinical and Translational Science, University of Vermont, Burlington, VT
2011 (Spring)	**Sole Instructor**, CTS 395 Applied Biomedical Informatics, Center for Clinical and Translational Science, University of Vermont, Burlington, VT
2011 (Spring)	**Supervisor**, CS 394 Independent Study: Clinical Association Rule Mining, Department of Computer Science, University of Vermont, Burlington, VT
2011 (Summer)	**Co-Instructor**, Biomedical Informatics Short Course for Medical Students, University of Vermont, Burlington, VT
2012 (Fall)	**Co-Instructor**, CTS 27 Introduction to Biomedical Informatics, Center for Clinical and Translational Science, University of Vermont, Burlington, VT
2013 (Spring)	**Invited Lecture** ("*Electronic Health Records and Research*"), CTS 309 Introduction to Research Management II, Center for Clinical and Translational Science, University of Vermont, Burlington, VT
2013 (Spring)	**Sole Instructor**, CTS 271/CS 295 Applied Biomedical Informatics, Center for Clinical and Translational Science (cross-listed with the Department of Computer Science), University of Vermont, Burlington, VT

TRAINEES

Advisor

2009 – pres.	Rhonda Kost, PhD Candidate, Department of Computer Science, University of Vermont, Burlington, VT (*Project: Association Rule Mining for Disease Co-Occurrences*)
2010 – 2011	Huimin Ye, PhD Candidate (graduated with MS), Department of Computer Science, University of Vermont, Burlington, VT (*Project: Anonymization of Health Datasets*)

2012 – 2013   Darlene Peterson, Medical Student (2nd Year), College of Medicine, University of Vermont, Burlington, VT (*Project: Problem Lists in the EHR*)

2013   Joshua Cohen, Certificate in Healthcare Management Program, University of Vermont, Burlington, VT (*Project: Problem Lists in the EHR*)

2013   Meghan Garcia-Webb, Medical Student (4th Year), College of Medicine, University of Vermont, Burlington, VT (*Project: Alcohol Use Documentation in the EHR*)

2013   Yucan Zhang, MS Student, Department of Computer Science, University of Vermont, Burlington, VT (*Project: Mining Association Rules in the Biomedical Literature*)

Thesis Committee Member

2010 – pres.   Kairn Kelley, PhD Candidate, Center for Clinical and Translational Science, University of Vermont, Burlington, VT

Comprehensive Exam Committee Member

2012   Abigail Crocker, PhD Candidate, Center for Clinical and Translational Science, University of Vermont, Burlington, VT

2012   Marianne Burke, PhD Candidate, Center for Clinical and Translational Science, University of Vermont, Burlington, VT

EDITORIAL RESPONSIBILITIES

2008 – pres.   *Member*, Editorial Advisory Board, The Open Medical Informatics Journal

2011 – 2012   *Lead Guest Editor*, Special Issue on "Translating Standards into Practice: Experiences and Lessons Learned in Biomedicine and Health Care", Journal of Biomedical Informatics

2013 – pres.   *Member*, Editorial Board, Methods of Information in Medicine

REVIEW RESPONSIBILITIES

Journal / Conference Reviews

14th World Congress on Medical and Health Informatics (MEDINFO 2013)
21st International Congress of the European Federation of Medical Informatics (MIE 2008)
AMIA Annual Symposium (2007 – pres.)
AMIA Summit on Clinical Research Informatics (2010; 2013)
AMIA Summit on Translational Bioinformatics (2008)
Artificial Intelligence in Medicine
BMC Medical Informatics and Decision Making
Computer Methods and Programs in Biomedicine
Computers in Biology and Medicine
IEEE Transactions on Information Technology in Biomedicine
International Journal of Data Mining and Bioinformatics
Journal of Biomedical Informatics
Journal of Healthcare Engineering
Journal of the American Medical Informatics Association
Methods of Information in Medicine
Open Medical Informatics Journal

Grant Reviews

2008   *Reviewer*, Disease Management of Chronic Diseases (DMCZ) program, The Netherlands Organisation for Health Research and Development (ZonMw)

2009   *Reviewer*, Challenge Grants, National Institutes of Health

Emerging Technologies and Training in Neurosciences (ETTN)
Bioengineering Sciences and Technologies (BST)
Healthcare Delivery and Methodologies (HDM)

2009   *Panel Member*, Computer & Information Science & Engineering, National Science Foundation
2010   *Reviewer*, American Institute of Biological Sciences (contracted by the U.S. Air Force Surgeon General for review of unsolicited research proposals)
2010   *Reviewer*, Challenge Grants, National Institutes of Health
                Oncology 1 – Basic Translational IRG (OBT)
2011   *Study Section Member*, Institutional Grants for Research Training in Biomedical Informatics (T15), National Library of Medicine, National Institutes of Health [ZLM1 AP-T (01); July 14, 2011 – July 15, 2011]
2012   *Study Section Member*, Special Emphasis Panel (K22/K99/R01), National Library of Medicine, National Institutes of Health [ZLM1 ZH-C (01); May 17, 2012]
2012   *Panel Member*, Novel Presentation of Health Related Data (NPHRD) Program, American Institute of Biological Sciences (contracted by the U.S. Army Medical Research and Materiel Command [USAMRMC] and the Telemedicine and Advanced Technology Research Center [TATRC], Joint Program Committee for Medical Training and Health Information Sciences [JPC-1]) [July 9, 2012 – July 11, 2012]
2012   *Study Section Member*, NLM Information Resource Grants to Reduce Health Disparities (G08), National Library of Medicine, National Institutes of Health [ZLM1 ZH-G (01); October 11, 2012 – October 11, 2012]
2012   *Study Section Member*, Special Emphasis Panel (R01/R12/G13), National Library of Medicine, National Institutes of Health [ZLM1 ZH-C (01); October 26, 2012]
2013   *Study Section Chair*, Special Emphasis Panel (K22/R01), National Library of Medicine, National Institutes of Health [ZLM1 ZH-C (01); January 26, 2013]
2013   *Reviewer*, Loan Repayment Program, National Institute of General Medical Sciences, National Institutes of Health [ZGM1 TRN-0 (LR); May 8, 2013]
2013   *Study Section Member*, Clinical Trials Units for NIAID Networks, National Institute of Allergy and Infectious Diseases, National Institutes of Health [ZAI1 SV-A (S1); June 18, 2013]
2013   *Study Section Member*, Special Emphasis Panel (K99/R13/R21/R01), National Library of Medicine, National Institutes of Health [ZLM1 ZH-C (01); June 26, 2013]
2013   *Panel Member*, JPC-1 Health Information Technology Program, American Institute of Biological Sciences (contracted by USAMRMC and TATRC) [August 21, 2013]

CONFERENCE PARTICIPATION

2007   *Session Chair*, AMIA 2007 Fall Symposium
2009   *Session Chair*, AMIA 2009 Translational Bioinformatics Summit
2009 – 2010   *Member*, Scientific Program Committee, AMIA 2010 Fall Symposium
                2010   *Judge*, Best Poster Award
                2010   *Session Chair*, Paper Session on "Responses to Clinical Alerting"
2010 – 2011   *Member*, Scientific Program Committee, AMIA 2011 Summit on Clinical Research Informatics
2011   *Member*, Program Committee (Health Informatics Track), IEEE Healthcare Informatics, Imaging, and Systems Biology Conference
2012   *Member*, Program Committee, International Conference on Intelligent Biology and Medicine (ICIBM 2012)
2013   *Member*, Distinguished Paper Awards Sub-Committee, AMIA 2013 Summit on Clinical Research Informatics

GRANT AND CONTRACT SUPPORT

Current

2012 – 2016   "Leveraging the EHR to Collect and Analyze Social, Behavioral & Familial Factors"
NIH/NLM   R01 LM011364   09/01/2012 – 08/31/2016
Principal Investigator (25% effort); Co-PI: Genevieve Melton (University of Minnesota)
The overall goal of this project is to develop and evaluate computational methods for generating knowledge regarding the relationships between diseases and social, behavioral, and familial factors from EHR data. Collaborative effort between University of Vermont and University of Minnesota.

2013 – 2014   "Data Abstraction Project"
Vermont Oxford Network (VON)   07/01/2013 – 06/30/2014
Co-Investigator (5% effort); PI: Indra Neil Sarkar (University of Vermont)
The long-term goal is to leverage data that are collected as part of the VON database in combination with data within electronic health records to support quality improvement reporting activities of the VON membership, as well as clinical, epidemiological, and informatics research initiatives.

Past

2004 – 2005   "Infobuttons to Improve Information Access in Order Entry"
NIH/NLM   R01 LM007593   09/01/2002 – 01/16/2009
Research Scientist; PI: James Cimino (Columbia University)
The goal of the project is to reduce the occurrence of an important proximal cause of medical errors: inadequate access to required information when making decisions.

2005 – 2007   "Mobile Decision Support for Advanced Practice Nursing"
NIH/NINR   R01 NR008903   05/13/2005 – 10/30/2008
Co-Investigator; PI: Suzanne Bakken (Columbia University)
This RCT evaluates the effect of PDA-based decision support on guideline adherence for 3 screening guidelines: obesity, depression, and smoking cessation.

2005 – 2007   "Capturing and Linking Genomic and Clinical Information"
NIH/NLM   R01 LM007659   08/01/2003 – 07/31/2008
Research Scientist; PI: Carol Friedman (Columbia University)
The long-term aim of this project is to use natural language processing (NLP) to build a high throughput tool for facilitating cancer research by automatically extracting and organizing clinical and genetic information from the Electronic Medical Record and from journal articles.

2008   "Enhancing Clinical Problem Lists Through Automated Techniques"
Partners-Siemens Research Council   03/03/2008 – 03/02/2009
Co-Principal Investigator (20% effort); Co-PI: Adam Wright (Partners HealthCare)
The goal of the project is to explore and apply automated techniques (i.e., natural language processing and data mining) to structured (e.g., medications and laboratory results) and unstructured (e.g., outpatient notes or discharge summaries) data for enhancing existing clinical problem lists.

2008   "Medical Language Processing Services: From Free-Text to Structured Clinical Statements"
Partners-Siemens Research Council   01/14/2008 – 01/13/2009
Project Director (30% effort); PI: Howard Goldberg (Partners HealthCare)
The goal of the project is to develop an architecture and initial set of components for an MLP service to extract, encode, and structure clinical statements (e.g., problems and

observations) from clinical text for a variety of subsequent applications (e.g., patient care, decision support, quality reporting, and research).

2010   "Create Decision Support Systems, quality and cost data analysis to support state sponsored and other program beneficiaries in receiving the highest quality and most cost effective services"
Vermont Agency of Human Services   01/01/2010 – 08/31/2010
Co-Investigator (15% effort); PI: Judith Shaw/Indra Neil Sarkar (University of Vermont)
This project aims to establish an extensible research data warehouse that will ultimately serve researchers and government officials for the State of Vermont.

2010 – 2011   "Planning Vermont's Healthcare Workforce Future"
HRSA   P50 HP20996   09/2010 – 09/2011
Investigator (10% effort); PI: Charles MacLean (University of Vermont)
Planning grant to convene representatives from the healthcare and education sectors in order to expand healthcare workforce planning efforts and improve the coordination with other Vermont healthcare system innovations.

2010 – 2011   "Mental Health Intergovernmental Service System Interactive Online Network for Vermont (MHISSION-VT)"
SAMHSA/CMHS   H79 SM058809   09/30/2008 – 09/29/2013
Investigator (10% effort); PI: Thomas Simpatico (University of Vermont)
Through an intergovernmental partnership that strives to build community and informatics infrastructure for mental health, the goal of this project is to address the needs of Vermont veterans and other adults with trauma spectrum illness who are also involved with the criminal justice system.

2010 – 2013   "A Curriculum for Clinical Research Training in Vermont"
NIH/NCATS   K30 TR000097   08/01/2010 – 05/30/2013
Faculty (10% effort); PI: Benjamin Littenberg (University of Vermont)
The overall goal is to effectively and efficiently transform clinicians and other young academics into successful independent clinical investigators.

2011   "Clinical Testing of a CDSS for Tobacco Use Treatment"
NIH/NCI   R21 CA134817   09/15/2008 – 08/31/2011
Informatician (5% effort); PI: Theodore Marcy (University of Vermont)
This project evaluates whether a decision support system on a personal digital assistant enhances physician tobacco-use brief interventions, a preventive service that is known to reduce smoking, the most common cause of preventable death in the U.S.

PRESENTATIONS

Local

1. (2000) ***Department Seminar***, "Evaluating the Content of a Multimedia Briefing System", Department of Biomedical Informatics, Columbia University, New York, NY.
2. (2002) ***Department Seminar***, "Wireless Technology and Its Use in Healthcare", Department of Biomedical Informatics, Columbia University, New York, NY
3. (2002) ***Seminar***, "PalmCIS: Palm-based Clinical Information System", Health Sciences Library, Columbia University, New York, NY
4. (2002) ***Department Seminar***, "Developing a Wireless Clinical Application: PalmCIS", Department of Biomedical Informatics, Columbia University, New York, NY
5. (2006) ***Seminar***, "Delivering Relevant Clinical Information at the Point of Care", Countway Medical Library, Harvard Medical School, Boston, MA

6. (2007) **Seminar**, "Linking Clinicians to Relevant Information at the Point of Care", Clinical Informatics Research & Development (CIRD), Partners HealthCare System, Wellesley, MA
7. (2008) **Invited Presentation**, "Agile Methodology at Partners HealthCare System (PHS)", Partners HealthCare Information Systems 5th Annual Technology Summit, Needham, MA
8. (2008) **Seminar**, "Building Blocks for Structuring Clinical Documents and Information", Clinical Informatics Research & Development (CIRD), Partners HealthCare System, Wellesley, MA
9. (2008) **Invited Presentation**, "Medical Language Processing Services: From Free-Text to Structured Clinical Statements", Information Systems Research Council (ISRC) Symposium, Boston, MA
10. (2009) **Department Seminar**, "Data, Text, and Web Mining in Healthcare", Department of Computer Science, University of Vermont, Burlington, VT
11. (2010) **Invited Presentation**, "Clinical Informatics: From Patient Care to Research", Department of Medicine Fellows' Research Seminar Series, University of Vermont, Burlington, VT
12. (2011) **Seminar**, "Towards Structuring and Standardizing Information Within Clinical Notes in the EHR", Informatics Grand Rounds, University of Vermont, Burlington, VT

National

13. (2003) **Meeting Presentation**, "Analysis of Clinical Information System Log Files to Uncover Clinician Usage Patterns", National Library of Medicine Training Directors' Meeting, Bethesda, MD
14. (2003) **Conference Presentation**, "Automated Discovery of Patient-Specific Clinician Information Needs Using Clinical Information System Log Files", AMIA 2003 Annual Symposium, Washington, DC
15. (2006) **Conference Presentation**, "Disseminating Natural Language Processed Clinical Narratives", AMIA 2006 Annual Symposium, Washington, DC
16. (2007) **Conference Presentation**, "The Use of Log Files in the System Development Life Cycle for Nurses", AMIA 2007 Spring Congress, Orlando, FL
17. (2007) **Conference Presentation**, "Detection of Practice Pattern Trends through Natural Language Processing of Clinical Narratives and Biomedical Literature", AMIA 2007 Annual Symposium, Chicago, IL
18. (2008) **Conference Presentation**, "Early Experiences in Evolving an Enterprise-Wide Information Model for Laboratory and Clinical Observations", AMIA 2008 Annual Symposium, Washington, DC
19. (2009) **Conference Presentation**, "Laying the Groundwork for Enterprise-Wide Medical Language Processing Services: Architecture and Process", AMIA 2009 Annual Symposium, Washington, DC
20. (2010) **Conference Presentation**, "Standardizing Clinical Document Names Using the HL7/LOINC Document Ontology and LOINC Codes", AMIA 2010 Annual Symposium, Washington, DC
21. (2011) **Conference Presentation**, "A Multi-Site Content Analysis of Social History Information in Clinical Notes", AMIA 2011 Annual Symposium, Washington, DC
22. (2012) **Conference Presentation**, "Characterizing the Use and Contents of Free-Text Family History Comments in the Electronic Health Record", AMIA 2012 Annual Symposium, Chicago, IL

International

23. (2004) **Conference Presentation**, "Patterns of Usage for a Web-based Clinical Information System", 11th World Congress on Medical Informatics (Medinfo 2004), San Francisco, CA
24. (2006) **Conference Presentation**, "An Automated Approach to Studying Health Resource and Infobutton Use", 9th International Congress on Nursing Informatics (NI 2006), Seoul, Korea

PUBLICATIONS

Peer-Reviewed Articles

1. McKeown K, Jordan D, Feiner S, Shaw J, <u>Chen E</u>, Ahmad S, Kushniruk A, Patel V. A study of communication in the Cardiac Surgery Intensive Care Unit and its implications for automated briefing. Proc AMIA Symp. 2000:570-4. PubMed PMID: 11079948; PubMed Central PMCID: PMC2244057.
2. Cimino JJ, <u>Chen ES</u>, McKnight LK, Stetson PD, Lei J, Mendonça EA. Mobile information and coordination for healthcare. In: Marin HF, Marques EP, Hovenga E, Goossen W, editors. NI 2003. Proceedings of the 8th International Congress in Nursing Informatics; 2003 Jun 20-25; Rio de Janeiro, Brazil; 2003:285-9.
3. <u>Chen ES</u>, Cimino JJ. Automated discovery of patient-specific clinician information needs using clinical information system log files. AMIA Annu Symp Proc. 2003:145-9. PubMed PMID: 14728151; PubMed Central PMCID: PMC1480002.
4. <u>Chen ES</u>, Mendonça EA, McKnight LK, Stetson PD, Lei J, Cimino JJ. PalmCIS: a wireless handheld application for satisfying clinician information needs. J Am Med Inform Assoc. 2004 Jan-Feb;11(1):19-28. PubMed PMID: 14527976; PubMed Central PMCID: PMC305454.
5. <u>Chen ES</u>, Cimino JJ. Patterns of usage for a Web-based clinical information system. Stud Health Technol Inform. 2004;107(Pt 1):18-22. PubMed PMID: 15360766.
6. Mendonça EA, <u>Chen ES</u>, Stetson PD, McKnight LK, Lei J, Cimino JJ. Approach to mobile information and communication for health care. Int J Med Inform. 2004 Aug;73(7-8):631-8. PubMed PMID: 15246044.
7. <u>Chen ES</u>, Bakken S, Currie LM, Patel VL, Cimino JJ. An automated approach to studying health resource and infobutton use. Stud Health Technol Inform. 2006;122:273-8. PubMed PMID: 17102263.
8. <u>Chen ES</u>, Hripcsak G, Friedman C. Disseminating natural language processed clinical narratives. AMIA Annu Symp Proc. 2006:126-30. PubMed PMID: 17238316; PubMed Central PMCID: PMC1839529.
9. Zhou L, Tao Y, Cimino JJ, <u>Chen ES</u>, Liu H, Lussier YA, Hripcsak G, Friedman C. Terminology model discovery using natural language processing and visualization techniques. J Biomed Inform. 2006 Dec;39(6):626-36. PubMed PMID: 16360342.
10. Bakken S, Roberts WD, <u>Chen E</u>, Dilone J, Lee NJ, Mendonca E, Markatou M. PDA-based informatics strategies for tobacco use screening and smoking cessation management: a case study. Stud Health Technol Inform. 2007;129(Pt 2):1447-51. PubMed PMID: 17911954.
11. <u>Chen ES</u>, Stetson PD, Lussier YA, Markatou M, Hripcsak G, Friedman C. Detection of practice pattern trends through Natural Language Processing of clinical narratives and biomedical literature. AMIA Annu Symp Proc. 2007 Oct 11:120-4. PubMed PMID: 18693810; PubMed Central PMCID: PMC2655911.
12. <u>Chen ES</u>, Hripcsak G, Xu H, Markatou M, Friedman C. Automated acquisition of disease drug knowledge from biomedical and clinical documents: an initial study. J Am Med Inform Assoc. 2008 Jan-Feb;15(1):87-98. PubMed PMID: 17947625; PubMed Central PMCID: PMC2274872.
13. <u>Chen ES</u>, Zhou L, Kashyap V, Schaeffer M, Dykes PC, Goldberg HS. Early experiences in evolving an enterprise-wide information model for laboratory and clinical observations. AMIA Annu Symp Proc. 2008 Nov 6:106-10. PubMed PMID: 18999078; PubMed Central PMCID: PMC2656065.
14. Lee NJ, <u>Chen ES</u>, Currie LM, Donovan M, Hall EK, Jia H, John RM, Bakken S. The effect of a mobile clinical decision support system on the diagnosis of obesity and overweight in acute and primary care encounters. ANS Adv Nurs Sci. 2009 Jul-Sep;32(3):211-21. PubMed PMID: 19707090.
15. <u>Chen ES</u>, Maloney FL, Shilmayster E, Goldberg HS. Laying the groundwork for enterprise-wide medical language processing services: architecture and process. AMIA Annu Symp Proc. 2009 Nov 14;2009:97-101. PubMed PMID: 20351830; PubMed Central PMCID: PMC2815370.

16. <u>Chen ES</u>, Sarkar IN. MeSHing molecular sequences and clinical trials: a feasibility study. J Biomed Inform. 2010 Jun;43(3):442-50. PubMed PMID: 19850150; PubMed Central PMCID: PMC2878930.

17. Melton GB, Raman N, <u>Chen ES</u>, Sarkar IN, Pakhomov S, Madoff RD. Evaluation of family history information within clinical documents and adequacy of HL7 clinical statement and clinical genomics family history models for its representation: a case report. J Am Med Inform Assoc. 2010 May-Jun;17(3):337-40. PubMed PMID: 20442153; PubMed Central PMCID: PMC2995709. (Originally published in: Proceedings of the 2009 AMIA Fall Symposium; 2009 Nov 14-18; San Francisco, CA; 2009.).

18. <u>Chen ES</u>, Melton GB, Engelstad ME, Sarkar IN. Standardizing Clinical Document Names Using the HL7/LOINC Document Ontology and LOINC Codes. AMIA Annu Symp Proc. 2010 Nov 13;2010:101-5. PubMed PMID: 21346949; PubMed Central PMCID: PMC3041326.

19. Wright A, <u>Chen ES</u>, Maloney FL. An automated technique for identifying associations between medications, laboratory results and problems. J Biomed Inform. 2010 Dec;43(6):891-901. PubMed PMID: 20884377.

20. <u>Chen ES</u>, Sarkar IN. Towards structuring unstructured GenBank metadata for enhancing comparative biological studies. AMIA Summits Transl Sci Proc. 2011;2011:6-10. PubMed PMID: 22211174; PubMed Central PMCID: PMC3248757.

21. <u>Chen ES</u>, Manaktala S, Sarkar IN, Melton GB. A multi-site content analysis of social history information in clinical notes. AMIA Annu Symp Proc. 2011;2011:227-36. PubMed PMID: 22195074; PubMed Central PMCID: PMC3243209.

22. Ye H, <u>Chen ES</u>. Attribute Utility Motivated k-anonymization of datasets to support the heterogeneous needs of biomedical researchers. AMIA Annu Symp Proc. 2011;2011:1573-82. PubMed PMID: 22195223; PubMed Central PMCID: PMC3243250.

23. <u>Chen ES</u>, Melton GB, Burdick TE, Rosenau PT, Sarkar IN. Characterizing the use and contents of free-text family history comments in the Electronic Health Record. AMIA Annu Symp Proc. 2012;2012:85-92. PubMed PMID: 23304276; PubMed Central PMCID: PMC3540518.

24. Melton GB, Manaktala S, Sarkar IN, <u>Chen ES</u>. Social and behavioral history information in public health datasets. AMIA Annu Symp Proc. 2012;2012:625-34. PubMed PMID: 23304335; PubMed Central PMCID: PMC3540479.

25. Sarkar IN, <u>Chen ES</u>. Determining compound comorbidities for heart failure from hospital discharge data. AMIA Annu Symp Proc. 2012;2012:809-18. PubMed PMID: 23304355; PubMed Central PMCID: PMC3540553.

26. Kost R, Littenberg B, <u>Chen ES</u>. Exploring generalized association rule mining for disease co-occurrences. AMIA Annu Symp Proc. 2012;2012:1284-93. PubMed PMID: 23304407; PubMed Central PMCID: PMC35404

Editorials

1. <u>Chen ES</u>, Melton GB, Sarkar IN. Translating standards into practice: experiences and lessons learned in biomedicine and health care. J Biomed Inform. 2012 Aug;45(4):609-12.

Book Contributions

1. <u>Chen ES</u>. Data, Text, and Web Mining in Healthcare. In: Liu L, Özsu MT, editors. Encyclopedia of Database Systems. Springer; 2009:692-6.

2. <u>Chen ES</u>. Unix Primer. In: Sarkar IN, editor. Methods in Biomedical Informatics. Academic Press; 2013. (in press)

3. <u>Chen ES</u>. Ruby Primer. In: Sarkar IN, editor. Methods in Biomedical Informatics. Academic Press; 2013. (in press)

4. <u>Chen ES</u>. Database Primer. In: Sarkar IN, editor. Methods in Biomedical Informatics. Academic Press; 2013. (in press)

5. Chen ES. Web Services Primer. In: Sarkar IN, editor. Methods in Biomedical Informatics. Academic Press; 2013. (in press)
6. Chen ES, Sarkar IN. Mining the Electronic Health Record for Disease-Specific Knowledge. In: Kumar VD, Tipney HJ, editors. Methods in Molecular Biology: Biomedical Literature Mining. Humana Press. (in preparation)

Theses

1. Chen ES. Extending the MAGIC (Multimedia Abstract Generation for Intensive Care) content planner [Master's thesis]. New York (NY): Columbia University; 2000.
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