

BIOGRAPHICAL SKETCH

NLP Focus

NAME: HURDLE, John F. MD, PhD
POSITION TITLE: Professor & NLP Service Line Director, Department of Biomedical Informatics and Chair, the Resource for Genetic and Epidemiologic Research School of Medicine, University of Utah

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	DATE AWARDED <i>(if applicable)</i>	FIELD OF STUDY
National Institutes of Health [NLM], Bethesda, MD	Senior Postdoctoral Fellow	2004	Biomedical Natural Language Processing
University of Utah, Department of Medical Informatics and The Veterans Administration, Salt Lake City, UT	Postdoctoral Fellow	1996	Biomedical Informatics
University of Utah, Salt Lake City, UT	PhD	1994	Computer Science
Columbia University, New York, NY	MS	1981	Computer Science
University of Colorado, Denver, Denver, CO	MD	1981	Medicine
Colorado College, Colorado Springs, CO	BA	1976	Chemistry

PROFESSIONAL STATEMENT

After training in medicine and computer science (MS), I spent a decade as a CIO. Half that time was work in a 225-bed hospital and the other half work in a large University system. The jobs were fine but bloodless. I had no passion for administration. When sheer good luck presented me a chance to return to graduate school, I completed my PhD in computer science, completed a post-doc in informatics, and jumped into clinical informatics research at the VA Medical Center in Salt Lake City. My first R01-equivalent grant was awarded in 2000 (VA HSR&D -- their *first* informatics research grant). We studied adverse drug events. One finding made a deep impression: in 60% of the ADEs our clinical pharmacists detected, the first ADE *signal* originated in a clinical note. I had never thought of text as data before that. So my next grant was an NIH/NLM F38 Senior Fellowship to re-tool in NLP. I was PI or co-PI on three subsequent NIH NLP grants. I explored a novel line of nutrition informatics research (see my 'Other' section), but kept up with clinical NLP. Dr. Shi and I have worked together for six years. His knack for building, and building quickly, NLP systems that work in the messy real world of clinical text impresses me to this day. I bring a track record of productive NLP project design/implementation experience with Dr. Shi, in addition to 15 years of funded research and operational NLP.

EMPLOYMENT AND POSITIONS HELD

INSTITUTION AND LOCATION	RESPONSIBILITIES	DATE
University of Utah, Biomedical Informatics, Salt Lake City, UT	Professor	2015 - present
University of Utah, School of Medicine, NLP Service Line (operational NLP service)	Director	2017 - present
University of Utah, Biomedical Informatics, Salt Lake City, UT	Associate Professor	2006 - 2015
University of Utah, Salt Lake City	Senior Biomedical Informatics Fellow (NIH F38)	2004 - 2005
University of Utah, Department of Medical Informatics, Salt Lake City, UT	Research Assistant Professor (Adjunct)	2002 - 2005

Veterans Administration Hospital, VA Geriatrics Research, Education, and Clinical Care (GRECC), Salt Lake City, UT	Research Informaticist	1996 - 2004
University of Utah, Department of Internal Medicine, Division of Geriatrics, Salt Lake City, UT	Research Assistant Professor	1996 - 2005
University of Utah, Computer Science, Salt Lake City, UT	Adjunct Lecturer	1990 - 1993
Info Systems, Admin Computing, Institutional Research, University of Maryland, European Division, Heidelberg	Director (CIO)	1985 - 1989
Information Services, The Graduate Hospital, Philadelphia, PA	Director (CIO)	1983 - 1985
Laboratory Data Processing, The Graduate Hospital, Philadelphia, PA	Director	1981 - 1983

HONORS

Member of American Association for the Advancement of Science (20+ years) and the American Medical Informatics Association (15 years)	
Fulbright Fellowship, Healthcare Informatics, Vietnam	2018 - 2019
Invited Faculty, National Library of Medicine Medical Informatics Course – Marine Biological Laboratory, Woods Hole, MA.	2011 - 2014
Standing Study Section, Biomedical Library & Informatics Review Committee (BLIRC); National Library of Medicine/NIH	2008 - 2012
John R. Park Teaching Fellowship, University of Utah, Salt Lake City, UT	2007
Reed M. Gardner Award for Faculty Excellence	2007
Fulbright Fellowship, Healthcare Informatics, India	1994 - 1995
Bachelor of Arts, cum laude. The Colorado College, Colorado Springs, CO	1976

SELECTED PEER-REVIEWED PUBLICATIONS

- Shi J, and **Hurdle JF**. Trie-Based Rule Processing for Clinical NLP: A Use-Case Study of n-Trie, Making the ConText Algorithm More Efficient and Scalable. *Journal of Biomedical Informatics*, 2018: 106-113
- Bui DD, Del Fiol G, **Hurdle JF**, Jonnalagadda S (2016). Extractive text summarization system to aid data extraction from full text in systematic review development. *J Biomed Inform*, 64, 265-272.
- Doing-Harris KM, Weir CR, Igo S, Shi J, Shao Y, **Hurdle JF** (2015). POETenceph – Automatic identification of clinical notes indicating encephalopathy using a realist ontology. *AMIA Annu Symp Proc*, 2015, 512-21.
- Kim Y, Riloff E, **Hurdle JF**. A Study of Concept Extraction Across Different Types of Clinical Notes. In *AMIA Annual Symposium Proceedings*. San Francisco: American Medical Informatics Association; 2015:737–46
- Jones DE, Igo S, **Hurdle J**, Facelli JC (2014). Automatic extraction of nanoparticle properties using natural language processing: NanoSifter an application to acquire PAMAM dendrimer properties. *PLoS One*, 9(1), e83932.
- Bradford W, **Hurdle JF**, LaSalle B, Facelli JC (2014). Development of a HIPAA-compliant environment for translational research data and analytics. *J Am Med Inform Assoc*, 21(1), 185-9.
- **Hurdle JF**, Smith KR, Mineau GP (2013). Mining electronic health records: an additional perspective. *Nat Rev Genet*, 14(1), 75.
- Workman TE, Fiszman M, **Hurdle JF** (2012). Text summarization as a decision support aid. *BMC Med Inform Decis Mak*, 12(1), 41.
- Pestian JP, Matykiewicz P, Linn-Gust M, South B, Uzuner O, Wiebe J, Cohen KB, **Hurdle J**, Brew C (2012). Sentiment Analysis of Suicide Notes: A Shared Task. *Biomed Inform Insights*, 5(Suppl 1), 3-16.
- Patterson O, **Hurdle JF** (2011). Document clustering of clinical narratives: a systematic study of clinical sublanguages. *AMIA Annu Symp Proc*, 2011, 1099-107.
- Workman TE, **Hurdle JF** (2011). Dynamic summarization of bibliographic-based data. *BMC Med Inform Decis Mak*, 11, 6.

- Patterson O, Igo S, **Hurdle JF**. Automatic acquisition of Domain-Specific Language Model: towards the word sense disambiguation of clinical narratives. AMIA Annu Symp Proc, 2010: 612-616
- Meystre SM, Thibault J, Shen S, **Hurdle JF**, South BR. Texttractor: a hybrid system for medications and reason for their prescription extraction from clinical text documents. J Am Med Inform Assoc, 2010, 17(5): 559-62.
- Meystre SM, Savova GK, Kipper-Schuler KC, **Hurdle JF**. (2008). Extracting information from textual documents in the electronic health record: a review of recent research. [Review]. Yearb Med Inform, 128-44.
- Penz JF, Wilcox AB, **Hurdle JF**. (2007). Automated identification of adverse events related to central venous catheters. J Biomed Inform, 40(2), 174-182.

OTHER SELECTED PUBLICATIONS

Relevant conference papers:

- Doing-Harris K, Igo S, Hurdle JF (August 2014). An Innovation in the Integration of Cognitive Science and NLP: A Multi-level, Multi-path Approach. Quebec City, CA: 36th Annual Conference of the Cognitive Science Society.
- Doing-Harris K, Patterson O, Igo S, **Hurdle J** (2013). Document Sublanguage Clustering to Detect Medical Specialty in Cross-institutional Clinical Texts. Proc ACM Int Workshop Data Text Min Biomed Inform, United States, 2013, 9-12.
- VistA Progress Notes as a Source for Adverse Drug Event Signals (2004). VA HSR&D Ann Meet, VA Health Services and Research Annual Meeting.

PUBLIC SPEAKING AND PRESENTATIONS

- Invited Panelist: AMIA Annual Symposium "Comparing and contrasting clinical and biomedical natural language processing"
- Invited talk: AMIA Annual Symposium Critical gaps in the world's largest electronic medical record: Ad Hoc nursing narratives and invisible adverse drug events.

RESEARCH SUPPORT

List both selected ongoing and completed research projects for the past 3 years. Begin with the projects that are most relevant to the research being proposed in the PCORI application. Briefly indicate the overall goals of the projects.

INSTITUTION AND LOCATION	RESPONSIBILITIES	DATE
University of Utah School of Medicine. \$100,000 . NLP Service Line research Award.	I am director of the NLP Service Line, whose goal is to conduct research on integrating NLP solutions into hospital operations. This work is highly germane to the work proposed in this application.	2017- present
USDA/AFRI Signature Award. \$1.6M . <i>Multi-Disciplinary Methods For Effective, Sustainable, And Scalable Evaluations Of Nutrition Education Programs</i> . Co-Principal Investigator: John F. Hurdle University of Utah/Utah State University.	I served as PI for the Utah site in this multi-site study. Utah also played the role of data coordinating center. My role included overseeing data collection and analysis, grocery vendor relations, algorithm design, preparing and editing oral and written presentations.	2016 - 2019

OTHER

For the past decade I maintained two laboratories, one devoted to clinical NLP like the work proposed here, and one devoted to nutrition informatics. In 2016 I was awarded, along with two nutrition colleagues, a \$1.6M USDA/AFRI Signature award. This was to be a 3-year project. Barely five months into it, Congress eliminated the entire unit in USDA funding our work (called a Regional Nutrition and Obesity Education Center of Excellence). We managed to continue a portion of the project under no-cost extensions. But my lab dissolved. I lost a post-doc and a pre-doc fellow when the

funds dried up). This was important work. We were studying how to measure the quality of grocery purchases in families relying on SNAP (formerly known as “food stamps”) and then planned to use those data to provide better education programs to these families. I shouldered much of the work the lab was doing. This was a necessary distraction from my formal NLP research.

While we have published our nutrition work consistently, my NLP publications production dropped. This explains the paucity of recent NLP articles. I fully expected the USDA Signature grant to be my last. That changed when Dr. Shi proposed we collaborate on this important PCORI project. I am delighted at the prospect of working with him and the project team.