



University of Pittsburgh

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Featured Inventors: Gaurav Trivedi, M.S., Harry Hochheiser, Ph.D.

An Interactive Natural Language Processing Platform

Making natural language processing accessible to everyone

Value Proposition

Research organizations have to process a large amount of documents in plain text. Our technology saves users time and effort by applying machine learned models to big datasets after an initial round of training. Our tool can be used for relevant applications in the medical domain for both clinical and research purposes. It can be a standalone research tool, or be integrated with existing systems. These techniques could also be generalized in other domains such as in Legal Management Systems.

Market Opportunity

Health care management software currently is a \$30 billion industry. Healthcare NLP applications alone are set to reach \$2.7 billion by 2020. This industry is being fueled by regulatory changes like the HiTech act as well as a general push to move all medical records online.

Competitive Landscape

Current players for NLP applications in medicine. Nuance, M*Modal, Health Fidelity, and Emerge Clinical Decision Solutions all offer Natural Language Processing as one of their services, but they are exclusively focused on reimbursements using ICD9 and 10 coding. We allow the end users, without NLP knowledge, to build models for their specific use case. Our technology serves a general purpose and is customizable for individual users.

IP Landscape

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Build NLP models with a point-and-click interface

Technology

Our technology enables domain experts such as clinicians and clinical experts make use of Natural Language Processing techniques using a point-and-click interface over the cloud. It combines novel text-visualizations to help its users make sense of NLP results, revise models and understand changes between revisions. It allows the users to make any necessary corrections to computed results, thus forming a feedback loop and helping improve the accuracy of the models.

Stage of Development

We have a working prototype designed to help colonoscopy researchers evaluate quality metrics from large volumes of clinical text. A demo is available at: <http://vimeo.com/trivedigaurav/emr-demo>.

Funding

This research was supported by NIH grant 5R01LM010964. Detailed descriptions can be found on the NIH Reporter website

FEATURED INVENTORS:

Gaurav Trivedi, M.S.

Gaurav is graduate student in Intelligent Systems Program at University of Pittsburgh. His research interests are in Intelligent Interfaces and Human-computer Interaction in Health Care. His current work is on designing interactive methods for natural language processing on clinical records. He has been working with Dr. Harry Hochheiser from the Department of Biomedical Informatics, in collaboration with the NLP group: Dr. Janyce Wiebe, Dr. Rebecca Hwa and Dr. Wendy Chapman for an NIH funded project on Interactive Search and Review of Clinical Records with Multilayer semantic annotations.

Education

MS, University of Pittsburgh
BTech, National Institute of Technology Karnataka

Publications

1. Jaromír Šavelka, **Gaurav Trivedi**, and Kevin Ashley. 2015. Applying an Interactive Machine Learning Approach to Statutory Analysis. In Proceedings of the 28th International Conference on Legal Knowledge and Information Systems. Braga, Portugal – Awarded the **Best Student Paper**
2. **Gaurav Trivedi**. 2015. Clinical Text Analysis Using Interactive Natural Language Processing. In Proceedings of the 20th International Conference on Intelligent User Interfaces Companion (IUI Companion '15). ACM. New York, NY.
3. **Gaurav Trivedi**, Phuong Pham, Wendy Chapman, Rebecca Hwa, Janyce Wiebe, Harry Hochheiser. 2015. An Interactive Tool for Natural Language Processing on Clinical Text. Presented at 4th Workshop on Visual Text Analytics (IUI TextVis 2015), Atlanta, GA.
4. **Gaurav Trivedi**, Phuong Pham, Wendy Chapman, Rebecca Hwa, Janyce Wiebe, and Harry Hochheiser. 2015. Bridging the Natural Language Processing Gap: An Interactive Clinical Text Review Tool. Poster presented at the 2015 AMIA Summit on Clinical Research Informatics.

Harry Hochheiser, Ph.D

Dr. Hochheiser is an assistant Professor in the Department of Biomedical Informatics and the Associate Director of the Biomedical Informatics Training Program at University of Pittsburgh.. He has published more than 25 peer-reviewed journal and conference papers and two book chapters. He is currently working on the development of highly-interactive, user-centered systems for finding and exploring biomedical datasets, with specific applications ranging from basic research data to electronic health records. He has been a member of the Executive Committee of the Association of Computing Machinery's US Public Policy Committee (USACM) since 2004, and is the co-author of Research Methods in Human-Computer Interaction (Wiley, 2010).

Education

Post-Doc, National Institute of Aging
PhD, University of Maryland
MS, Massachusetts Institute of Technology
BS, Massachusetts Institute of Technology

Publications

1. Romagnoli KM, Boyce R, Empey PE, Adams S, **Hochheiser H**. Bringing clinical pharmacogenomics information to pharmacists: a qualitative study of information needs and resource requirements. *International Journal of Medical Informatics*. 86:54-61. PMID:26725696
2. King A, Cooper GF, **Hochheiser H**, Clermont G, Visweswaran S. Development and Preliminary Evaluation of a Prototype of a Learning Electronic Medical Record System. *2015 AMIA Annual Symposium*; 2015
3. **Hochheiser H**, Ning Y, Hernandez AM, Horn JR, Jacobson RS, Boyce R. Using Nonexperts for Annotating Pharmacokinetic Drug-Drug Interaction Mentions in Product Labeling: A Feasibility Study. *JMIR Research Protocols*

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