

ClinicalNLP 2022

**The 4th Workshop on Clinical Natural Language Processing
(ClinicalNLP)**

Proceedings of the Workshop

July 14, 2022

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Preface

This volume contains papers from the 4th Workshop on Clinical Natural Language Processing (Clinical NLP), held at NAACL 2022.

Clinical text offers unique challenges that differentiate it not only from open-domain data, but from other types of text in the biomedical domain as well. Notably, clinical text contains a significant number of abbreviations, medical terms, and other clinical jargon. Clinical narratives are characterized by non-standard document structures that are often critical to overall understanding. Narrative provider notes are designed to communicate with other experts while at the same time serving as a legal record. Finally, clinical notes contain sensitive patient-specific information that raise privacy and security concerns that present special challenges for natural language systems. This workshop focuses on the work that develops methods to address the above challenges, with the goal of advancing state-of-the-art in clinical NLP.

This year, we received the total of 16 submissions, out of which 12 were accepted for presentation.

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Rui Zhang, University of Minnesota

Invited Speakers

Hongfang Liu, Mayo Clinic
Mark Dredze, Johns Hopkins University

Keynote Talk: It's Time to Rethink the Future of Clinical NLP

Mark Dredze

Johns Hopkins University

Abstract: The past decade has seen tremendous progress in the field of clinical natural language processing. Driven by new algorithms and access to clinical text from electronic medical records, clinical NLP is quickly becoming a standard tool used in patient care, secondary use and medical research. At the same time, the field of NLP as a whole is undergoing a rapid transformation driven by large language models. Given these developments, it's time that we rethink the future of clinical NLP.

Bio: Mark Dredze is the John C Malone Associate Professor of Computer Science at Johns Hopkins University. He is affiliated with the Malone Center for Engineering in Healthcare, the Center for Language and Speech Processing, among others. He holds a secondary appointment in the Biomedical Informatics & Data Science Section (BIDS), under the Department of Medicine (DOM), Division of General Internal Medicine (GIM) in the School of Medicine. He obtained his PhD from the University of Pennsylvania in 2009.

Prof. Dredze's research develops statistical models of language with applications to social media analysis, public health and clinical informatics. Within Natural Language Processing he focuses on statistical methods for information extraction but has considered a wide range of NLP tasks, including syntax, semantics, sentiment and spoke language processing. His work in public health includes tobacco control, vaccination, infectious disease surveillance, mental health, drug use, and gun violence prevention. He also develops new methods for clinical NLP on medical records.

Beyond publications in core areas of computer science, Prof. Dredze has pioneered new applications in public health informatics. He has published widely in health journals including the Journal of the American Medical Association (JAMA), the American Journal of Preventative Medicine (AJPM), Vaccine, and the Journal of the American Medical Informatics Association (JAMIA). His work is regularly covered by major media outlets, including NPR, the New York Times and CNN.

Keynote Talk: The Reproducible, Implementable, Transparent, and Explainable (RITE) framework for Real-world Implementation of Clinical Natural Language Processing

Hongfang Liu
Mayo Clinic

Abstract: Over the past decade, Electronic Health Record (EHR) systems have been widely implemented with large amounts of detailed longitudinal patient information, including lab tests, medications, disease status, and treatment outcomes, have consequently been accumulated and made electronically available. These large clinical databases are valuable data sources for clinical and translational research with several large clinical data initiatives (e.g., OHSDI, PCORnet, and CTSA). One common challenge faced by those initiatives is, however, the prevalence of clinical information embedded in unstructured text where natural language processing (NLP) techniques can be leveraged. Despite a plethora of recent advances in adopting NLP for clinical research, there have been barriers towards adoption of NLP solutions in clinical and translation research, especially in multisite settings. In this talk, I will discuss our strategy towards addressing those barriers through proposing a RITE-FAIR (Reproducible, Implementable, Transparent, and Explainable - Findable, Accessible, Interoperable, and Reusable) framework for clinical NLP.

Bio: Hongfang Liu is Dr. Richard F. Emslander Professor of Biomedical Informatics of Mayo Clinic and served as the founding chair of Division of Digital Health Sciences. She also directs biomedical informatics in Mayo Clinic Center of Clinical and Translational Science and Mayo Clinic Comprehensive Cancer Center and leads the ADVANCE program (Accelerating Discovery to Delivery through Advanced Informatics and Analytics for Clinical Excellence). Dr. Liu received her formal training in Mathematics, Statistics, Information and Computer Sciences with extensive research expertise in biomedical informatics. Her primary research interest is in clinical and biomedical Natural Language Processing and terminology/ontology. Dr Liu's work in clinical informatics has resulted in informatics systems that unlock clinical information stored in clinical narratives. Her work accelerates the pace of knowledge discovery, implementation and delivery for improved health care. Her research has been continuously supported by grants from National Science Foundation and National Institute of Health including NSF CAREER award and NCATS Innovation Award. Dr. Liu currently leads the community-wide effort on open health natural language processing (OHNLP) which aims to promote open source and interoperable NLP for clinical and translational research. Dr. Liu is a member of several professional societies, including the American Medical Informatics Association (AMIA) and the International Society for Computational Biology (ISCB). She is a fellow of American College of Medical Informatics (FACMI) and a fellow of International Academy of Health Sciences Informatics (FIAHSI).

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Program

Thursday, July 14, 2022

08:30 - 08:40 *Opening Remarks*

08:40 - 09:25 *Keynote: Mark Dredze*

09:25 - 09:40 *Keynote Q&A*

09:40 - 10:00 *Session 1*

CLPT: A Universal Annotation Scheme and Toolkit for Clinical Language Processing

Saranya Krishnamoorthy, Yanyi Jiang, William Buchanan, Ayush Singh and John E. Ortega

10:00 - 10:20 *Break*

10:20 - 12:00 *Session 2*

PLM-ICD: Automatic ICD Coding with Pretrained Language Models

Chao-Wei Huang, Shang-Chi Tsai and Yun-Nung Chen

An exploratory data analysis: the performance differences of a medical code prediction system on different demographic groups

Heereen Shim, Dietwig Lowet, Stijn Luca and Bart Vanrumste

Cross-Language Transfer of High-Quality Annotations: Combining Neural Machine Translation with Cross-Linguistic Span Alignment to Apply NER to Clinical Texts in a Low-Resource Language

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Fine-tuning BERT Models for Summarizing German Radiology Findings

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Clinical Flair: A Pre-Trained Language Model for Spanish Clinical Natural Language Processing

Matías Rojas, Jocelyn Dunstan and Fabián Villena

12:00 - 13:30 *Lunch*

Thursday, July 14, 2022 (continued)

13:30 - 15:10 *Session 3*

Exploring Text Representations for Generative Temporal Relation Extraction
Dmitriy Dligach, Steven Bethard, Timothy A Miller and Guergana K Savova

Ensemble-based Fine-Tuning Strategy for Temporal Relation Extraction from the Clinical Narrative

Lijing Wang, Timothy A Miller, Steven Bethard and Guergana K Savova

Learning to Ask Like a Physician

Eric Lehman, Vladislav Lialin, Katelyn Edelwina Yap Legaspi, Anne Janelle R. Sy, Patricia Therese S. Pile, Nicole Rose Alberto, Richard Raymund Reyes Ragsa, Corinna Victoria M. Puyat, Marianne Katharina Vicera Taliño, Isabelle Rose I Alberto, Pia Gabrielle Isidro Alfonso, Dana Moukheiber, Byron C Wallace, Anna Rumshisky, Jennifer J. Liang, Preethi Raghavan, Leo Anthony Celi and Peter Szolovits

What Do You See in this Patient? Behavioral Testing of Clinical NLP Models
Betty Van Aken, Sebastian Herrmann and Alexander Löser

RRED : A Radiology Report Error Detector based on Deep Learning Framework

Dabin Min, Kaeun Kim, Jong Hyuk Lee, Yisak Kim and Chang Min Park

15:10 - 15:30 *Break*

15:30 - 15:50 *Session 4*

m-Networks: Adapting the Triplet Networks for Acronym Disambiguation

Sandaru Seneviratne, Elena Daskalaki, Artem Lenskiy and Hanna Suominen

15:50 - 15:35 *Keynote: Hongfang Liu*

15:35 - 16:50 *Keynote Q&A*

16:50 - 17:00 *Closing Remarks*