

Mapping Free Text Clinical Notes to Medical Terminology

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My Research Project

- NLP on clinical data
- Deep understanding of clinical text
- Extract structured information from free medical notes
 - Support clinical Information retrieval
 - Health information systems

Clinical Notes

- Unstructured free text
- Weakly grammatical writing
- Large vocabulary
- Assumed knowledge between reader and writer
- Analysis of such medical documents require deep understanding

Medical Terminology

- First step to understand clinical text
- Medical terminology conveys the semantic meaning used in medical communication
- Encoded data can improve information retrieval
 - Synonyms
 - Concept based indexing
- Using a standard terminology can improve interoperability cross information systems

The Problem...

- Information retrieval are limited because lack of interoperability between medical terminologies
 - Different terminologies
 - Synonyms / Preferred terms
 - Ad hoc classifications
- Terminology mapping
 - SNOMED CT (The Systematized Nomenclature of Medicine Clinical Terminology)

Map Medical Concept to Terminology

- Coding medical concepts with terminology
- Abbreviation
 - RA = right atrial
 - RA = rheumatoid arthritis
- Negation
 - *cancer and no evidence of cancer*
- Term composition
 - pain, chronic pain, back pain, chronic back pain.

Text to SNOMED CT System

- Map medical terms in clinical notes to SNOMED CT terminology.
 - Augmented SNOMED CT Lexicon
 - Negation Identification
 - Abbreviation Identification
 - Qualification Identification
- Capture real-time clinical data and response with medical codes

Knowledge Representation of the Data

- Bag of concepts
- Connect concepts using meaningful relationships
 - With the help of ontology
- Knowledge representation of clinical data
 - Third degree burn of elbow
 - Finding = “burn” Location = “elbow” Severity = “third degree”
- Knowledge based information retrieval
 - Alignment of similar patient case reports
 - Adverse event discovery