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Semantic Medline

Overview and Demo

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Motivation

* Biomedical information is growing at an increasingly faster pace
  * High-throughput approach to knowledge processing
* Information retrieval is the starting point, not the end of the journey for the researcher
  * Towards “computable” knowledge
* Integration between literature and other resources is insufficient
  * Adequate for navigation purposes
  * Insufficient for knowledge processing
Applications

◆ Refined information retrieval
  ● Indexing on relations in addition to concepts
  ● Find articles asserting that IL-13 inhibits COX-2

◆ Multi-document summarization
  ● Extract and visualize facts from the literature
  ● Summarize the top 300 papers on panic disorder

◆ Question answering
  ● Clinical and biological questions
  ● What drugs interact with imipramine?

◆ Knowledge discovery
  ● Reasoning with facts from heterogeneous resources
  ● From MEDLINE and UMLS together
Information integration

- Transform resources into a common format
  - UMLS Metathesaurus
  - Other NCBI databases
  - Drug knowledge bases
  - ...
- Integrate resources
  - Query across resources

APP \(\rightarrow\) Alzheimer disease

PARK1 \(\rightarrow\) Parkinson disease

Alzheimer disease \(\rightarrow\) Parkinson disease

Neurodegenerative diseases

Alzheimer disease

Parkinson disease

APP \(\rightarrow\) Alzheimer disease

PARK1 \(\rightarrow\) Parkinson disease

has_associated_disease

isa
Pilot Application

Populating and exploiting the Biomedical Knowledge Repository

Semantic Medline:
Multi-document summarization and visualization

With Marcelo Fiszman, M.D., Ph.D.
and Halil Kilicoglu, M.S.
Managing retrieval results

Information retrieval

Text mining

Network of relations

Semantic Medline

NCBI

PubMed

Network of relations

500 citations
Managing retrieval results

Search PubMed for epilepsy
Semantic Medline Live

Semantic Medline Live

Lister Hill National Center for Biomedical Communications