Information Retrieval: Course Introduction

Saptarshi Ghosh, Pawan Goyal

CSE, IITKGP

January 8th, 2020

Course Info

Course Website:

`http://cse.iitkgp.ac.in/~pawang/courses/IR20.html`

Shared with Prof. Saptarshi Ghosh

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Meeting Times

- Regular Hours:
  - Wednesday - 10:00 - 11:00 (NC - 132)
  - Thursday - 9:00 - 10:00 (NC - 132)
  - Friday - 11:00 - 12:00 (NC - 132)

Course Info

Teaching Assistants

- Rajdeep Mukherjee
- Shounak Paul
- Avirup Mukherjee
- Prajwal Singhania

Books and Materials

Reference Books

- Christopher D. Manning, Prabhakar Raghavan, and Hinrich Schütze. 2008. *Introduction to Information Retrieval*, Cambridge university press.

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- Christopher D. Manning, Prabhakar Raghavan, and Hinrich Schütze. 2008. *Introduction to Information Retrieval*, Cambridge university press.

Lecture Material

- Additional Readings
- Lecture Slides

Course Evaluation Plan: Tentative

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- Mid-Sem : 30%

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- End-Sem : 40%

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- Mid-Sem : 30%
- End-Sem : 40%
- Term Project: 30%

What is Information Retrieval?

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What is a document?

web pages, emails, books, news stories, scholarly papers, text messages, Powerpoint, PDF, forum postings, patents, tweets, question answer postings, etc.

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- Easy to compare fields with well-defined semantics to queries in order to find matches

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Example bank database query

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Example search engine query

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- This text must be compared to the text of entire news stories

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Searching for the pages on WWW

Typical IR tasks

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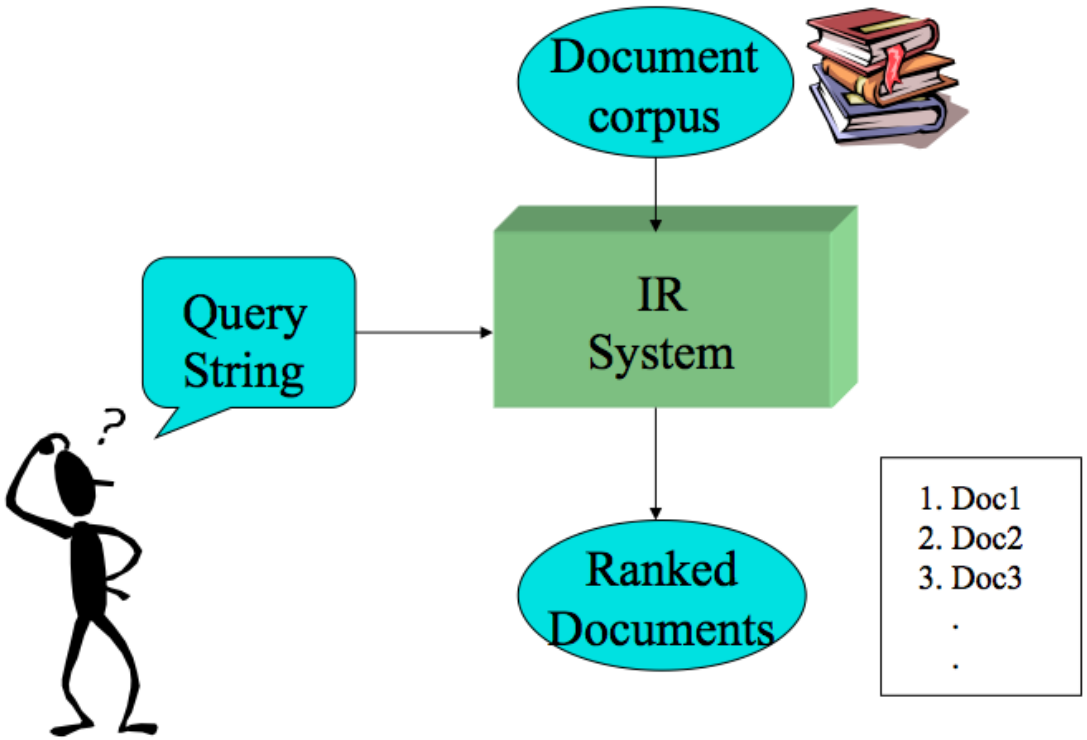
Find:

- A ranked set of documents that are relevant to the query.

IR System



The system should be able to retrieve the relevant docs efficiently

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- Being on the proper subject.
- Being timely (recent information).
- Being authoritative (from a trusted source).
- Satisfying the goals of the user and his/her intended use of the information (information need).

Simplest notion of Relevance from Retrieval Models' Perspective

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- Simplest notion of relevance is that the query string appears verbatim in the document.
- Slightly less strict notion is that (most of) the words in the query appear frequently in the document, in any order (*bag of words*).

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- 'Java' (programming language vs. Island)

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Where do we find the latest happenings in the field?

Top Conferences in the field

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- WSDM

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- SIGIR
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Other Venues

- ECIR
- ACM Transactions on Information Systems
- Springer IR Journal, JASIST, etc.

Active Areas of Research

Compiled based on some recent papers at SIGIR and related conferences, just indicative, not exhaustive

What to retrieve

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- *Leveraging User Reviews to Improve Accuracy for Mobile App Retrieval*. SIGIR 2015.

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- *Exploiting Food Choice Biases for Healthier Recipe Recommendation.* SIGIR 2017.
- *Cross-Modal Interaction Networks for Query-Based Moment Retrieval in Videos.* SIGIR 2019.

Search Experience

- *Engaged or Frustrated? Disambiguating Emotional State in Search.* SIGIR 2017.
- *Between Clicks and Satisfaction: Study on Multi-Phase User Preferences and Satisfaction for Online News Reading.* SIGIR 2018.
- *Understanding and Modeling Success in Email Search.* SIGIR 2017.
- *Using Information Scent to Understand Mobile and Desktop Web Search Behavior.* SIGIR 2017.

Personalization, Behavior, Conversation, Social, etc.

- *The Utility and Privacy Effects of a Click*. SIGIR 2017.
- *Why People Search for Images using Web Search Engines*. WSDM 2018.
- *Joint Learning of Response Ranking and Next Utterance Suggestion in Human-Computer Conversation System*. SIGIR 2017.
- *Asking Clarifying Questions in Open-Domain Information-Seeking Conversations*. SIGIR 2019.
- *Predicting Which Topics You Will Join in the Future on Social Media*. SIGIR 2017.

What do we cover in this course

IR Basics

- Boolean retrieval
- The term vocabulary & postings lists
- Dictionaries and tolerant retrieval
- Index construction and compression
- Scoring, term weighting & the vector space model
- Computing scores in a complete search system
- Evaluation in information retrieval
- Relevance feedback & query expansion
- Probabilistic information retrieval
- Language models for information retrieval

Course Contents

Web Search, Applications, Recent Advances

- Web Search and Applications such as Query Auto-completion
- Link analysis
- Summarization
- Neural IR
- Learning to Rank
- Domain-specific IR