Advices for Course Projects

(Search and Data Mining)

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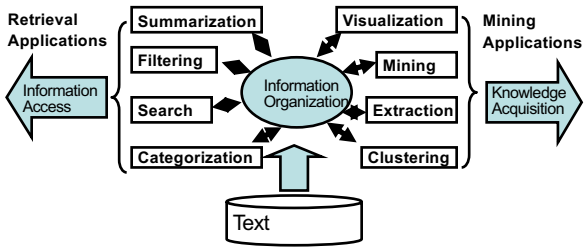
Schedule

- Pre-proposal: Due on Feb. 24
  - Submit one paragraph to describe what you would like to work on (problem and importance)
  - Specify who you would prefer to work with
- Proposal: the week of March 9.
  - Written report (1 page)
  - Oral presentation (15-20 minutes)
- Literature survey (May 4, optional for 400 level)
- Final report and presentation (the week of May 11)

Last Lecture: Overview of IR Techniques



Today's Lecture

- How to choose a course project?
- How to do a course project?

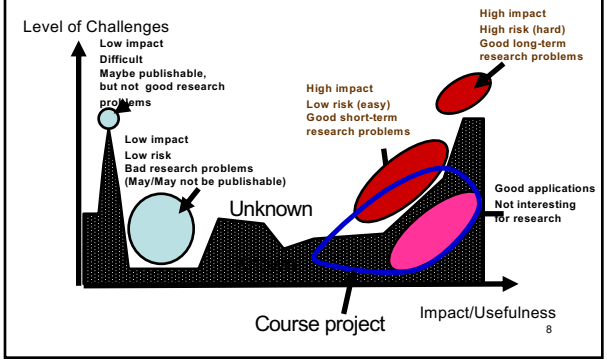
Course Project Topics

A good research problem is a solvable challenge that is well connected to a real world need/problem

Picking Fun Projects

- Criteria
  - **Exciting and interesting**
  - **Important** problems
- Take time to understand the problem
  - Catch up background
  - Get your own insights
- Peer evaluation:
  - Which project will you invest with your 1M$?

Identify a Good Research Problem



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Three Basic Questions to Ask

- Who are the users? **Everyone (who has an Internet connection)**
  - Everyone vs. Small group of people
- What data do we have? **The whole web (indexed by Google)**
  - Web (whole web vs. sub-web)
  - Email (public email vs. personal email)
  - Literature (general vs. special discipline)
  - Blog, forum, …
  - Tweets
- What functions do we want to support? **Search (by keywords)**
  - Information access vs. knowledge acquisition
  - Decision and task support

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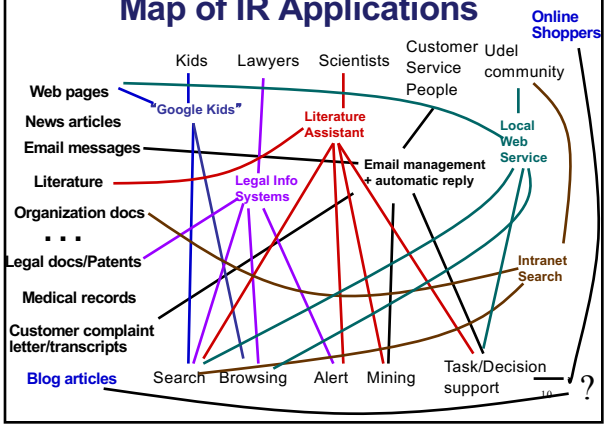
Map of IR Applications



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IR Problems Around Us

- Can we mine online user comments to discover "what are hot topics"?
- How to better manage our personal emails?
- How to improve search quality?
- Can we do better for searching our department website?
- How to find information about our alumni?
- …

Projects my group have worked on

- IR theory
  - Axiomatic approaches
  - Entity centric
  - Domain knowledge
  - Efficiency…
  -

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Projects my group have worked on

- Applications
  - Politics
    - Break echo chamber
    - Misinformation identification
  - Disaster
  - Health
    - Depression
    - Clinical decision
    - Drug side effect
    - HeNN
  - Education
    - Online
    - Cyberbullying

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A Course Project

- Your Interests
- Social Impact or Technology Innovation

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Some common interests based on your hobbies

- Sports
- Gaming
- Cooking
- History
- Music
- Dance
- Cyber security
- Energy
-

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More on choosing topics

- New applications
  - Demonstrate the feasibility
- Existing applications
  - Better results with heuristic methods
  - Better results with well-justified methods
  - Using existing methods
- Theory?

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Past course projects (1)

- Circuit monkey:
  - an electronic parts parameteric and optimization search engine
- HomeFinder
  - Cross-references apartment listings with aggregated local crime reports provided by local police public outreach websites
- GameFinder
  - Find cheapest game price
  - Similar video game suggestion
- Event recommendtion

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Past course projects (2)

- A Math search engine
- Information retrieval on financial statement reports
- Twitter word cloud and sentiment analysis
- Buzzsaw: mining log
- Next word prediction
- Recipe search

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Past course projects (3)

- e-coupon clipper
- Drink receipt
- Locational activity tracker
- Recmine – record mining
- Find your dish
  - Build a new restaurant recommendation system based on existing ones with food picture GUI and offer suggestion according to dish names provided by a user

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How to do a course project?

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Major Steps

- Form a team
- Pick a topic
- Read related work
- Write/present a proposal
- Conduct the project
- Present/write a report for the project

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Team Research is More Fun

- Team discussion is stimulating
- You handle the up-and-downs together
  - Less pressure
- Group size for our course projects
- Remember that I am part of your team!

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What to get out of a paper?

The essence, rather than the trivia

- ❑ Use one sentence to summarize the paper
- ❑ Use several sentences to summarize the problem, the motivation, the approach, and the conclusion
- ❑ Use a paragraph to describe the details

The procedure

- ❑ Read the abstract
- ❑ Understand the introduction and the conclusion
- ❑ Thoroughly go through the problem definition, the methodology
- ❑ Dive into the technical details
- ❑ Check the related work and literature

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Propose a project

- What is the function of the tool?
- Who will benefit from such a tool?
- Does this kind of tools already exist?
  - If similar tools exist, how is your tool different from them?
  - Would people care about the difference?
- What existing resources can you use?
- What techniques/algorithms will you use to develop the tool?
- How will you demonstrate the usefulness of your tool.
- A very rough timeline to show when you expect to finish what.
- How do you plan to distribute the work load?

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Looking for Solutions

- Don't limit to your comfortable zone
- Broaden your eyes
- Don't let fear of failure stop you

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Tell Your Fun Findings to Others

- Write a paper
- Present it

The greatest ideas are worthless if you keep them to yourself.

Giving a good talk

- What your talk is for
- What to put in it (and what not to)
- How to present it

What your talk is for

Your paper = **The beef**