With the exponential growth of the Web in the past decades, we are facing a flood of information. The success of GYM (Google, Yahoo and MSN) has shown that Information Retrieval is a key component to assist users to access target information based on their need. The course provides a solid introduction to information retrieval theories and concepts underlying all search applications. We will investigate techniques used in modern search engines and demonstrate their significance by experiment.

In this course, you will learn:

- The most important and up-to-date retrieval theories and models
- How to use these theories and models to design and implement search engines
- Work in teams to build your own search components and interfaces
- How to use information retrieval in other related fields, i.e. digital library, online shopping, multimedia environment…
- Enhance your own search experience by understanding retrieval theories

Course materials

We will have class reading every week to cover each given topic. All assigned readings should be completed before each class. Each student need to read and try to understand the content of the reading. Meanwhile, during this semester, each student will prepare to give two presentations to class (for the chosen topics) about the readings.

There are two recommend books, but not required:


Course grading

Course grading will be based on class participation, class presentations, homework assignments and final projects.
Ownership of Student Work

This course may use course participation and documents created by students for educational purposes. In compliance with the Federal Family Educational Rights and Privacy Act, works in all media produced by students as part of their course participation at Syracuse University may be used for educational purposes, provided that the course syllabus makes clear that such use may occur. It is understood that registration for and continued enrollment in a course where such use of student works is announced constitutes permission by the student. After such a course has been completed, any further use of student works will meet one of the following conditions: (1) the work will be rendered anonymous through the removal of all personal identification of the work’s creator/originator(s); or (2) the creator/originator(s)’ written permission will be secured. As generally accepted practice, honors theses, graduate theses, graduate research projects, dissertations, or other exit projects submitted in partial fulfillment of degree requirements are placed in the library, University Archives, or academic departments for public reference.

Schedule

<table>
<thead>
<tr>
<th></th>
<th>Topic</th>
<th>Assignment</th>
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<tbody>
<tr>
<td>1</td>
<td>Aug 24, 25</td>
<td>Introduction</td>
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<tr>
<td></td>
<td><strong>Readings:</strong></td>
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<tr>
<td></td>
<td>Introduction for modern information retrieval</td>
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<td><a href="http://people.ischool.berkeley.edu/~hearst/irbook/chapters/chap1.html">http://people.ischool.berkeley.edu/~hearst/irbook/chapters/chap1.html</a></td>
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<tr>
<td>2</td>
<td>Aug 31, Sep 1</td>
<td>Search engine architectures</td>
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<tr>
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<td><strong>Readings:</strong></td>
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<tr>
<td></td>
<td>An Introduction to Information Retrieval</td>
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<tr>
<td></td>
<td>Chapter 1, 2</td>
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<tr>
<td>2.5</td>
<td>Sep 8</td>
<td>SPECIAL (No Monday)</td>
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<tr>
<td>3</td>
<td>Sep 14, 15</td>
<td>Index</td>
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<tr>
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<td><strong>Readings:</strong></td>
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<td></td>
<td>What is information retrieval index (Wikipedia)</td>
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<td></td>
<td>An Introduction to Information Retrieval</td>
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<td>Week</td>
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| 4    | Sep 21, 22 | Retrieval Models (Vector Space & Boolean)| **Readings:**  
* A vector space model for automatic indexing  
* An Introduction to Information Retrieval  
  Chapter 6  
**  
| 5    | Sep 28, 29 | Retrieval Models (Probability & Language Model) | **Readings:**  
* An Introduction to Information Retrieval  
  Chapter 6  
**  
| 6    | Oct 5, 6   | Evaluation                                | An Introduction to Information Retrieval  
  Chapter 11, 12  
**  
| 7    | Oct 12, 13 | Ranking and User Feedback                | An Introduction to Information Retrieval  
  Chapter 8  
**  
| 8    | Oct 19, 20 | Personalization                           | Improving retrieval performance by relevance feedback  
  The PageRank Citation Ranking: Bringing Order to the Web  
  http://scholarwiki.indiana.edu/wiki/index.php?title=The_PageRank_Citation_Ranking:_Bringing_Order_to_the_Web  
**  
| 9    | Oct 26, 27 | Classification and Clustering            | An Introduction to Information Retrieval  
  Chapter 13, 16  
**  
| 10   | Nov 2, 3   | Social Search and Info-Recommendation    | Social network based recommendation  
  How to search a social network  
**  
| 11   | Nov 9, 10  | Natural Language Processing              | Natural Language Processing  
  Enhanced test retrieval using NLP  
**  
| 12   | Nov 16, 17 | Lucene+Graph Lab                         | Ontology-based Information Visualization  
  Visual Information Retrieval with the SuperTable + Scatterplot  
  A Self-organizing Semantic Map for Information Retrieval  
**  
|      | Nov 23, 24 | Thanksgiving Break!                      |**  

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<thead>
<tr>
<th>Date</th>
<th>Readings</th>
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<tbody>
<tr>
<td>Nov 30, Dec 1</td>
<td><strong>Graph Search and Sentiment Analysis</strong></td>
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<tr>
<td></td>
<td><strong>Readings:</strong></td>
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|       | *Visualizing semantic spaces and author co-citation networks in digital libraries*  
http://scholarwiki.indiana.edu/wiki/index.php?title=Visualising_Semantic_Spaces_and_Author_Co-Citation_Networks_in_Digital_Libraries |
|       | *Rich interaction in the digital library*  
|       | *Digital libraries and autonomous citation indexing*  
http://scholarwiki.indiana.edu/wiki/index.php?title=Digital_Libraries_and_Autonomous_Citation_Indexing |
| Dec 7, 8 | **Final presentation** |