Xpantrac connection with IDEAL

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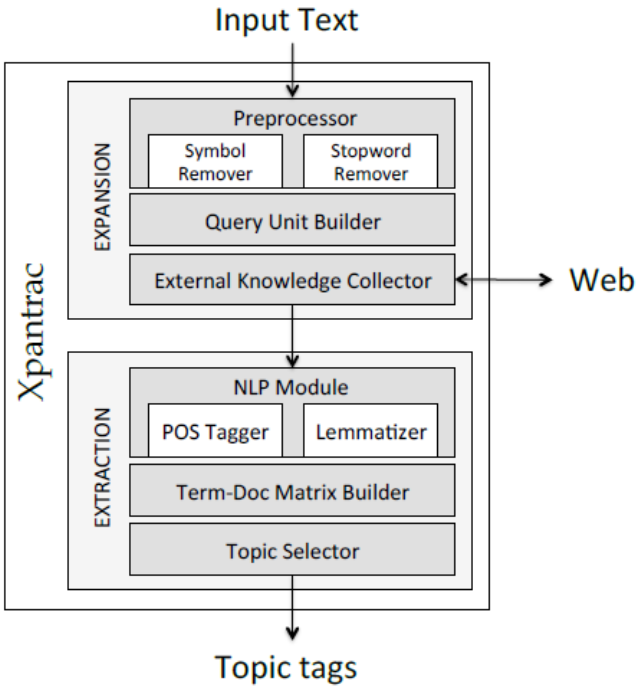
Project Specification

- **Short Description**
  - Integrating Xpantrac into the IDEAL software suite
  - Applying Xpantrac to identify topics for IDEAL webpages
- **Primary Contact**
  - Seungwon Yang
- **Deliverable**
  - Xpantrac tailored for IDEAL

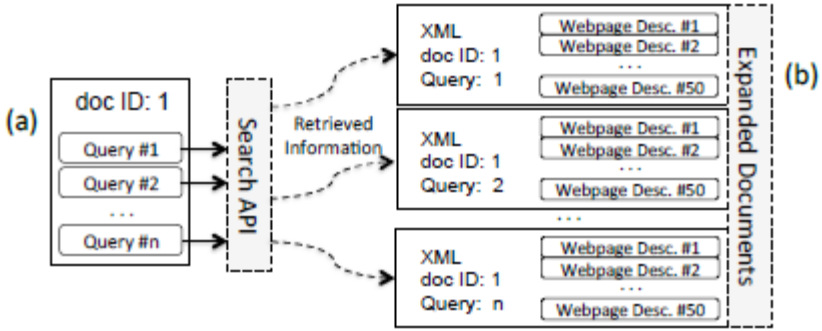
What is Xpantrac?

- Seungwon Yang's dissertation topic
- Based on E**xpan**sion-Ex**trac**tion approach
- Algorithm to identify topics in a given webpage
- Purpose: Tag topics to easily understand document
- Combines Cognitive Informatics with Information Retrieval
- Currently, only running on Seungwon's personal data set

What is Xpantrac?



Xpantrac Algorithm Overview



- A single input document is expanded to multiple expanded XML format documents
- Ultimately, search API will be replaced with Apache Solr (Different project for IDEAL)
- Uses Vector Space Model approach for topic identification - http://en.wikipedia.org/wiki/Vector_space_model (black box - no need to know to implement)

Example Input/Output

Input

Knife-wielding mob kills 27 at China train station
By CNN Staff
.....
.....

Output

--------- m39 10 topics ---------
station, people, attach, news, train, china, xinhua, railway, group, knife

Current Progress

- Quick python script written to get html out of .warc (web archive) files
- Xpantrac currently runs on local data set (50 .txt files) and gives correct output, using Yahoo Web API
  - Needs to eventually use Apache Solr since that is what IDEAL uses
- Started indexing .html CNN news files to SOLR/Got familiar with Solr
  - Stores information like title, first 30 words, last 30 words, etc. to easily use as input for Xpantrac

Use case

- Librarian wants to be able to search 100 short stories for a contest by topic
- He/She will upload the 100 stories using the Xpantrac UI
  - Topic tags can currently be extracted from UI
- Topics will then be added in the meta data of the pages on the Library website for easy searching
- User of Library website can now look up a short story by topic name

Current UI

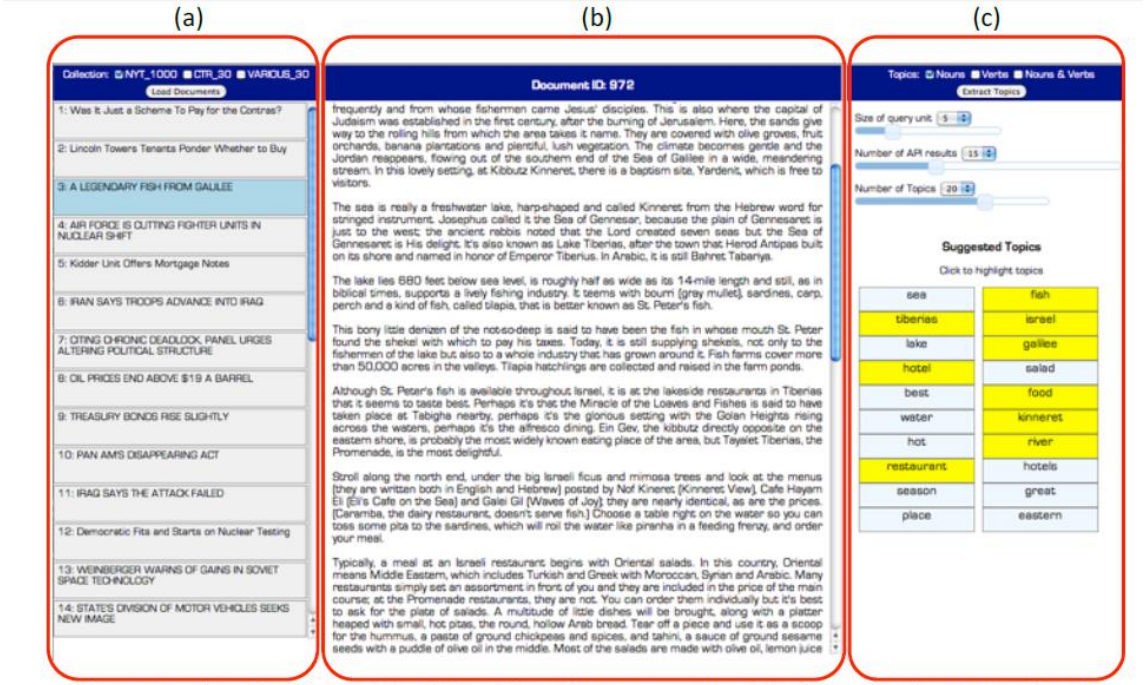


Figure 36. The overall user interface of the Xpantrac system: (a) The Collection Pane, (b) The Document Pane, and (c) The Topics Pane.

What is Apache Solr?

- Solr is a popular enterprise search platform that allows you to index and search documents.
- Allows for an easy creation of a search engine for websites, databases, and user provided files.
- Offers features such as:
  - Full Text Searching
  - Rich Document Parsing and Indexing (such as Word, PDF, etc)

Indexing With Solr

```
set theCounter to 0
tell application "Terminal"
	(* The first window starts up the server *)
	tell window 1
		set currentTab to do script ("cd Desktop/solr-4.6.1/example")
		do script ("java -jar start.jar") in currentTab
	end tell
	delay 10
	(* The second window uploads the html files *)
	tell window 2
		set currentTab to do script ("cd Desktop/html")
		repeat 51 times
			delay 5
			do script ("curl \"http://localhost:8983/solr/update/extract?
					literal.id=doc" & theCounter & "&commit=true\" -F
					\"myfile" & theCounter & "=@" & theCounter & ".html
					\"") in currentTab
			set theCounter to theCounter + 1
		end repeat
	end tell
end tell
```

Querying With Solr

```
http://server_hostname:port_name/solr/collection1/select?q=web_doc_cont
ent%3A1%20AND%20web_doc_id%3Actr_1&wt=json&json.wrf=?
```

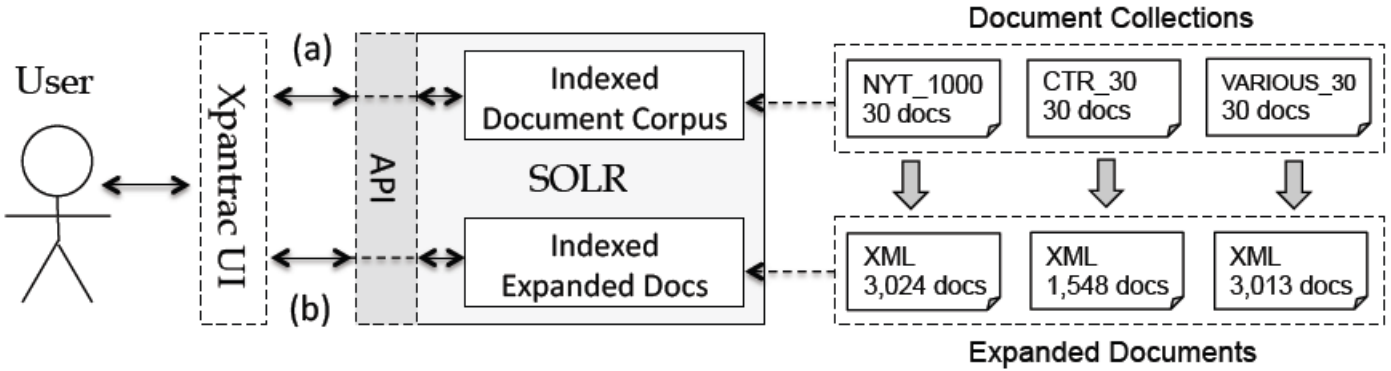
- A SOLR API query to retrieve a text document in JSON format
  - Can also use the web interface

Querying Results


```
{
  "responseHeader":{
    "status":0,
    "QTime":2,
    "params":{
      "indent":"true",
      "q":"web_doc_id:ctr_1 AND web_doc_content:1",
      "wt":"json"}},
  "response":{"numFound":1,"start":0,"docs":[
      {
        "id":"4603",
        "web_doc_id":"ctr_1",
        "web_title":"Haiti braces for Isaac's deluge",
        "web_text":"Haiti braces for Isaac’s deluge\n \nThe threat of a
        direct hit by Isaac on Southeast Florida might be declining but
        the Keys remain in the firing line. Rain and gusts could affect
        much of the state.\n\nRelated Content\nAn early look: What’s
        open and closed as Isaac approaches\nTrack Tropical Storm
        Isaac\n\nBY CURTIS MORGAN\nCMORGAN@MIAMIHERALD.COM\n\nPORT-AU-
```


Resulting JSON object retrieved from SOLR query

How Solr Fits Into The Puzzle



A diagram showing the indexing of documents and expanded documents using SOLR to emulate a search engine API.

Constraints of Using Xpantrac With Solr

- In order to use Xpantrac with Apache Solr, two constraints must be followed
  - It should index a massive number of documents, so that any documents from users could be expanded based on indexed information
  - It should return the most relevant portion of the matching documents, for a query

Deadlines

- **February**
  - 1st: Determine topic, Get client approval
  - 15th: Discuss roles & timelines; Get instructor approval; Try out Apache Solr

- **March**
  - 1st: Decompress files (with IDEALpages); Begin working with Xpantrac
  - 15th: Xpantrac - Begin Batch & Interactive Modes
  - 29th: Xpantrac - Continue Batch & Interactive Modes

Deadlines

- **April**
  - 12th: Stretch Goal: Tweets and Archive Files
  - 26th: Finalize project & prototype; Final Report
- **May**
  - 1st – 6th: Final Presentation
  - 6th: Final Paper

References

- Automatic Identification of Topic Tags from Texts Based on Expansion-Extraction Approach by Yang, Seungwon, Virginia Polytechnic and State University, 2013, 230 pages. (Seungwon's dissertation)

- SOLR tutorial: https://lucene.apache.org/solr/tutorial.html

Questions?