

HW4: Crawler & Main Content Extraction

403410034 資工四 黃鈺程

Outline

- Environment
- Main Content Extraction
 - Data
 - Block Segmentation
 - Reconstruction Error
- Hacker News Crawler
 - URLs
 - Result

Environment

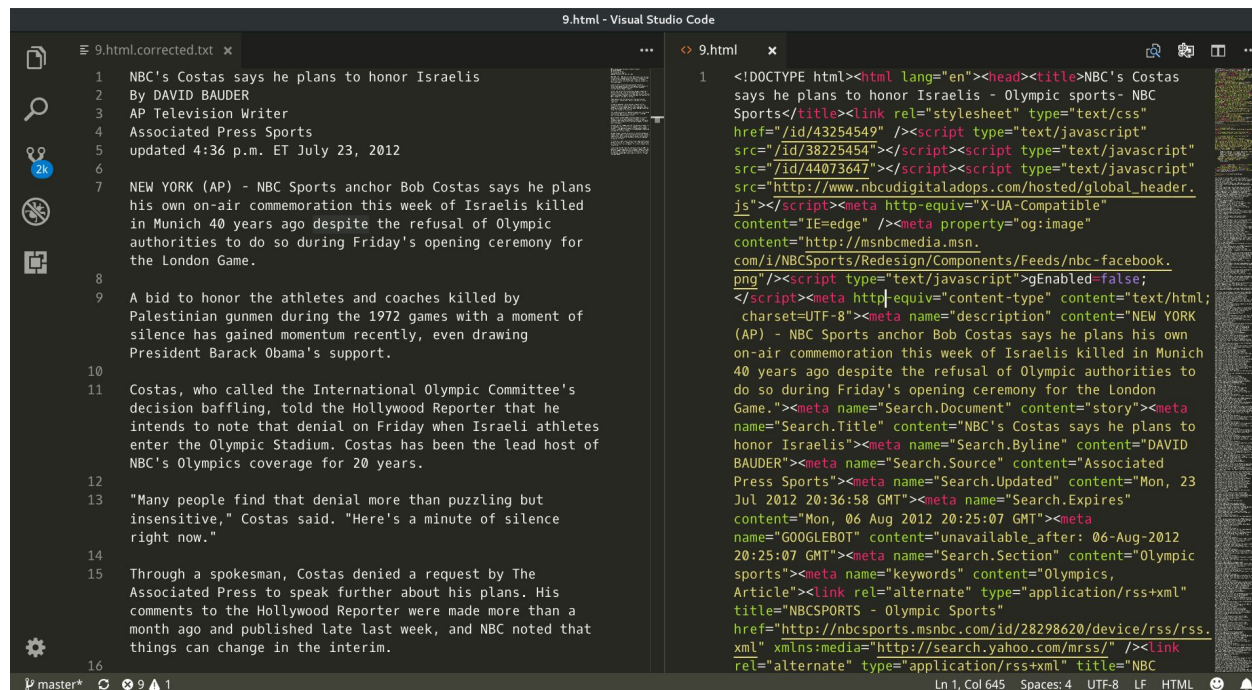
- Fedora 27
 - Intel(R) Core(TM) i5-6200U CPU @ 2.30GHz
 - 4 Cores
 - 4 GB
- Python 3
 - Jupyter, Numpy, Pandas, Matplotlib,
 - Requests, Selenium, BeautifulSoup4

Main Content Extraction

- Plan
 - Perform classification using Random Forest on DOM elements.
 - Features:
 - Tag type
 - Depth of element
 - Content length
 - etc
 - We need to have a label on each elements

Data

- From Dragnet
 - https://github.com/seomoz/dragnet_data
 - HTML & Corrected Text
 - 1000 Training, 300 Testing



```
9.html - Visual Studio Code
9.html.corrected.txt x
1 NBC's Costas says he plans to honor Israelis
2 By DAVID BAUDER
3 AP Television Writer
4 Associated Press Sports
5 updated 4:36 p.m. ET July 23, 2012
6
7 NEW YORK (AP) - NBC Sports anchor Bob Costas says he plans
8 his own on-air commemoration this week of Israelis killed
9 in Munich 40 years ago despite the refusal of Olympic
10 authorities to do so during Friday's opening ceremony for
11 the London Game.
12
13 A bid to honor the athletes and coaches killed by
14 Palestinian gunmen during the 1972 games with a moment of
15 silence has gained momentum recently, even drawing
16 President Barack Obama's support.
17
18 Costas, who called the International Olympic Committee's
19 decision baffling, told the Hollywood Reporter that he
20 intends to note that denial on Friday when Israeli athletes
21 enter the Olympic Stadium. Costas has been the lead host of
22 NBC's Olympics coverage for 20 years.
23
24 "Many people find that denial more than puzzling but
25 insensitive," Costas said. "Here's a minute of silence
26 right now."
27
28 Through a spokesman, Costas denied a request by The
29 Associated Press to speak further about his plans. His
30 comments to the Hollywood Reporter were made more than a
31 month ago and published late last week, and NBC noted that
32 things can change in the interim.
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Block Segmentation

- Split DOM into **disjoint** blocks
- I use reversed DFS to iterate on DOM
 - Deeper elements first
 - Emit a block if content of subtree > 15
 - And extracted from DOM
 - And label is TRUE if
 - $\text{LCS}(\text{content}, \text{truth}) / \max(\text{len}(\text{content}), \text{len}(\text{truth})) > 0.2$
 - Pass, otherwise

Reconstruction Error

- My segmentation is good in some cases, but bad in other cases
- To quantitatively measure, I set up a metric for reconstruction error.
- $\text{LCS}(\text{re}, \text{gt}) / \max(\text{len}(\text{re}), \text{len}(\text{gt}))$ where
 - re: reconstruction text
 - gt: ground truth
- Result is bad
 - min: 0.06
 - max: 1.00
 - avg: 0.6x

Hacker News Crawler

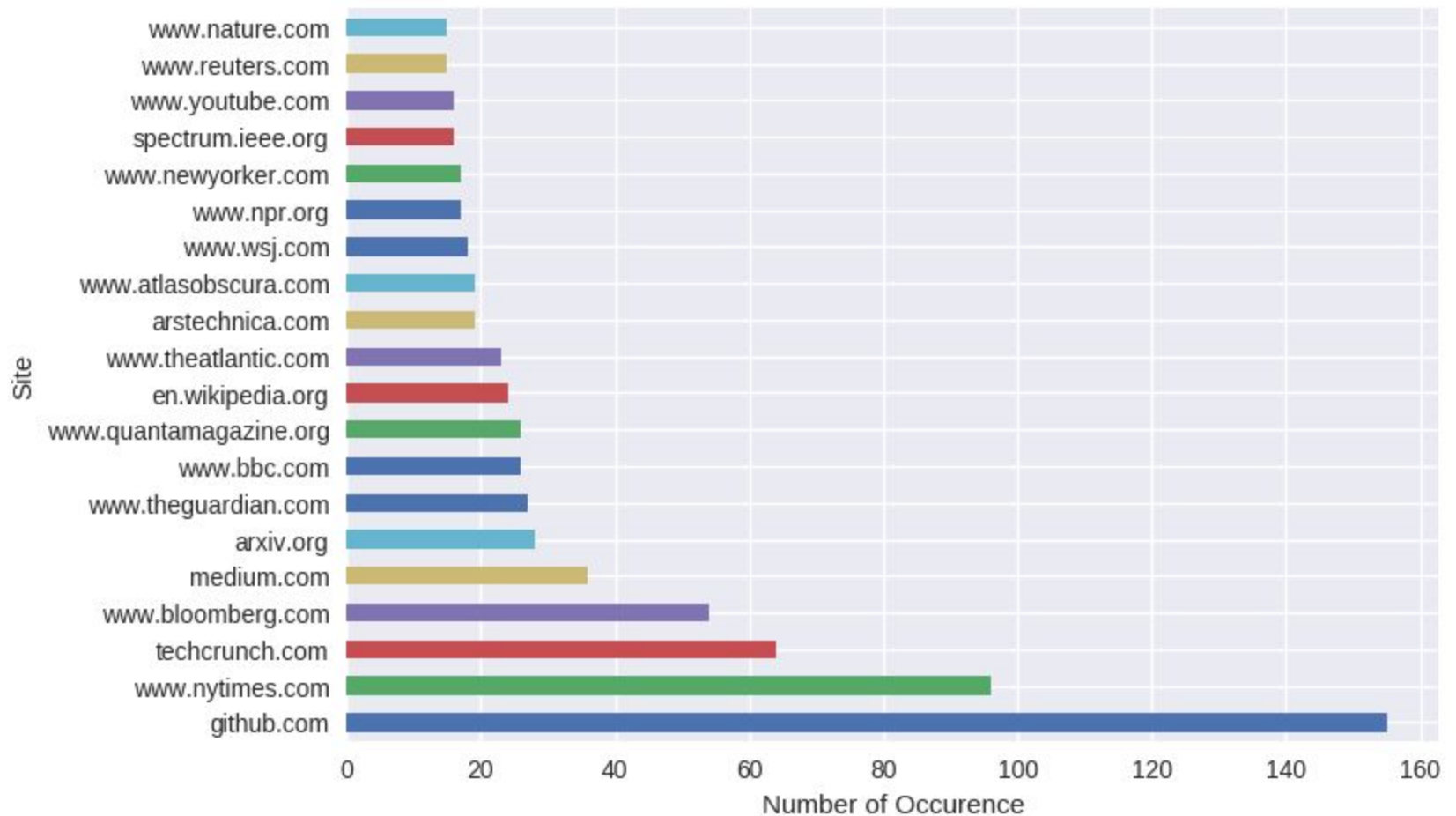
- Found no solution so far, give up.
- Build a simple crawler instead
- Crawl on Hacker News' Stories
 - Lots of different websites
- Top 30 stories of each day.
 - 90 days
- 2700 urls, 1415 distinct sites

Hacker News Crawler

Y **Hacker News** [new](#) | [comments](#) | [show](#) | [ask](#) | [jobs](#) | [submit](#)

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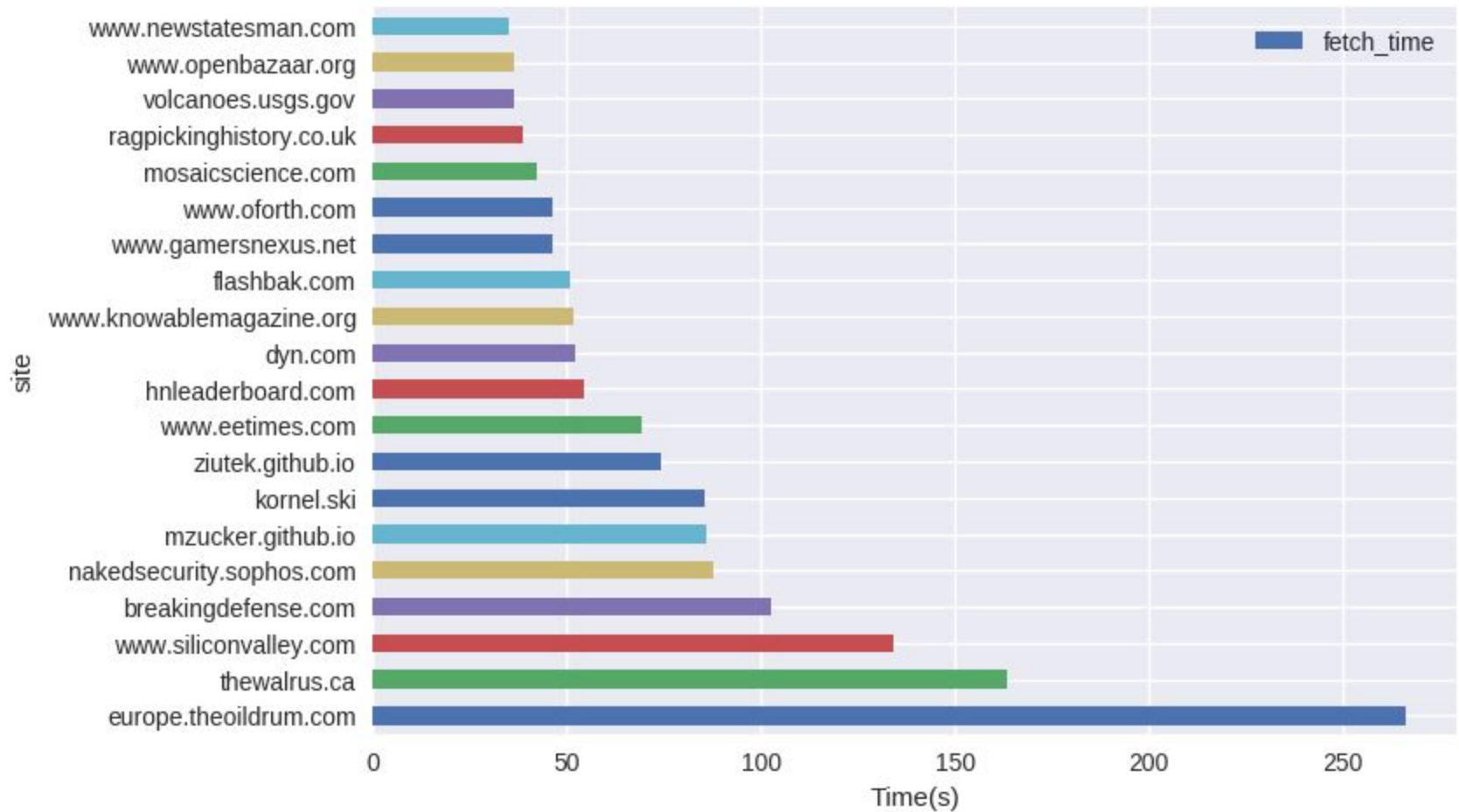
Top 20 Sites



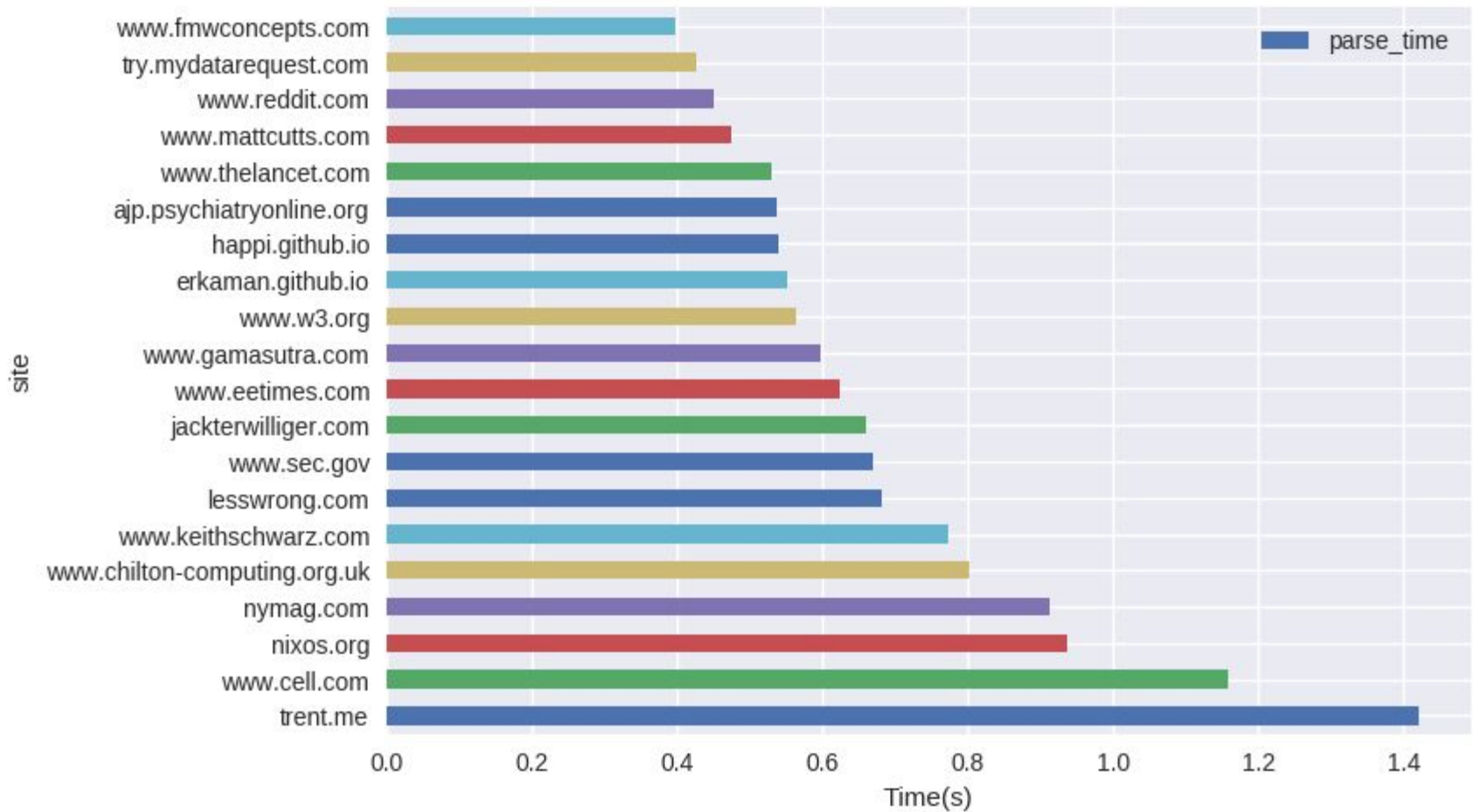
Result

- Take 5 hours
- Use Selenium + Chrome because Chromote has bugs.

Top 20 Average Fetch Time



Top 20 Average HTML Parse Time



Conclusion

- Selenium + Chrome is robust
 - Not Crashing when crawling
 - But difficult to set Timeout
- NLP is so difficult to learn
 - Want something like “*Introduction to NLP and its Application*”
 - Especially, applied to Chinese