SI485i : NLP

Set 1

Intro to NLP

Fall 2012 : Chambers

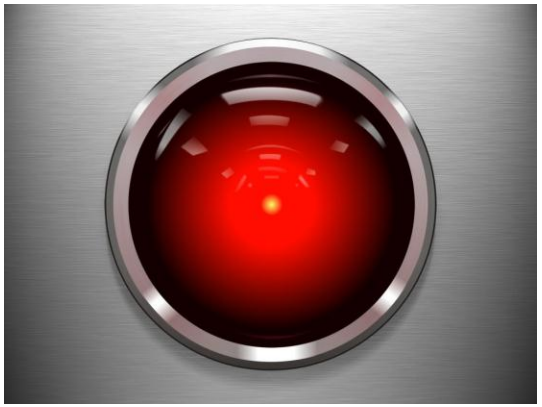
Assumptions about You

- You know…
  - how to program Java
  - basic UNIX usage
  - basic probability and statistics (we'll also review)

- You will learn…
  - computational approaches to manipulating and understanding language
  - basic learning algorithms
  - how to build practical systems

Early NLP

- **Dave**: Open the pod bay doors, HAL.
- **HAL**: I'm sorry Dave. I'm afraid I can't do that.



Commercial NLP

the problem session for your course, CS224n in Gates B03 from
1:15-2:05
Skilling Aud
Create New iCal Event...
Show This Date in iCal...

cymfony
harnessing influ

PEARSON
Knowledge Technologies

Google™

ski resort

Powerset

YAHOO!®

Microsoft®

Sugar Bowl Ski Lodging
Escape to our Snowbound Village.
Fresh tracks steps from your room.
www.sugarbowl.com

BETA
hakia®
search for meaning

Their are many approaches,
out

collective intellect

J.D.POWER
AND ASSOCIATES®

Nielsen
BuzzMetrics

State of the Art NLP

- **Speech recognition**: audio in, text out
  - SOTA: 0.3% error for digit strings, 5% dictation, 50% TV
- **Text-to-speech**: text in, audio out
  - SOTA: Very intelligible, but often bad prosody
- **Information extraction**: text in, DB record out
  - SOTA: 40–90% field accuracy, all depending on details
- **Parsing**: text in, sentence structure out
  - SOTA: Over 90% dependency accuracy for formal text
- **Question answering**: text in, question answer out
  - SOTA: 70%+ for factoid questions, otherwise challenging
- **Machine translation**: language A to language B
  - SOTA: Now often usable for gisting purposes; not great

So what is NLP?

- Go beneath the surface of words
  - Don’t just manipulate move word strings
  - Don’t just keyword match on search engines

- **Goal**: recover *some* aspect of the *structure* in language (groups of words move together)
- **Goal**: recover *some* of the *meaning* in language (words map to real-world things)

NLP is hard. (news headlines)

1. Minister Accused Of Having 8 Wives In Jail
2. Juvenile Court to Try Shooting Defendant
3. Teacher Strikes Idle Kids
4. Miners refuse to work after death
5. Local High School Dropouts Cut in Half
6. Red Tape Holds Up New Bridges
7. Clinton Wins on Budget, but More Lies Ahead
8. Hospitals Are Sued by 7 Foot Doctors
9. Police: Crack Found in Man's Buttocks

NLP needs to adapt.

The Bamboozle @TheBamboozle 7 Aug

#ballin "@TheGunzShow: @thebamboozle being able to show tens of thousands of ppl that i'm a **baller**. oh and TREOS!!"

Expand

Tracy Trinita @TracyTrinita 1m

RT @flo_ren: Tommorow, 6pm, at GPPS Hosana will be held the Revival Night with @TracyTrinita for more info u can ask me lockerz.com/s/233083091

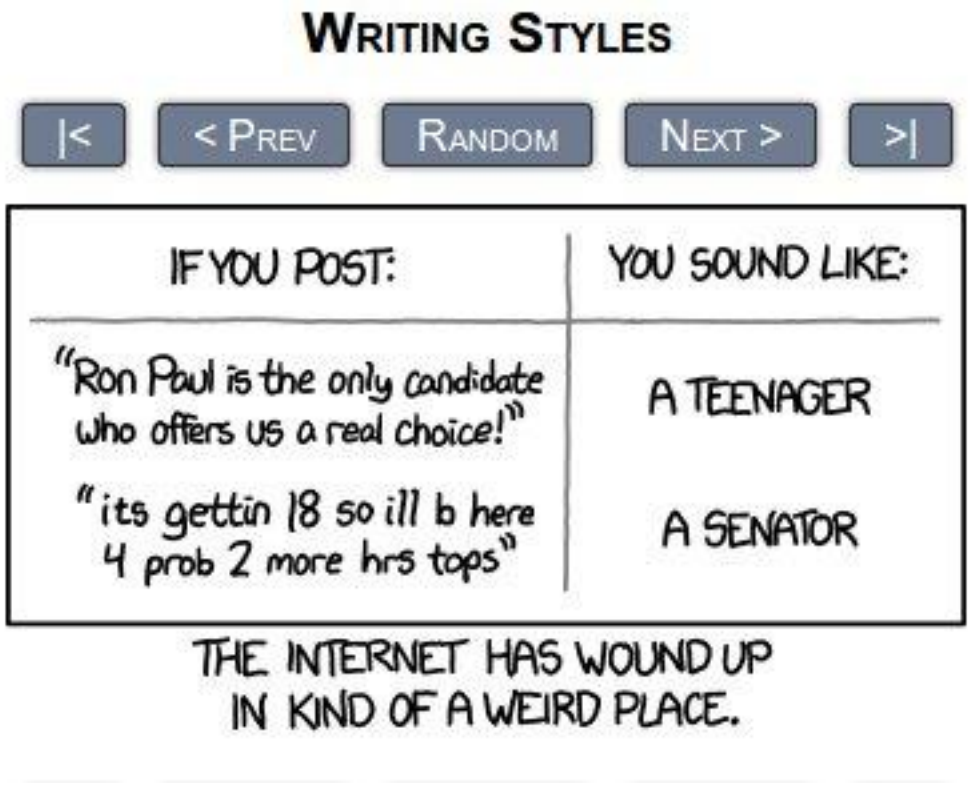
View photo

Sketch - #JO_LADY @ItzSketch 3h

3) #Friday House Party [Today] ... Housee Party At lekki .. Gate Fee: Free For the first 3 people to download #Jo_Lady tonight.

Expand

NLP needs to adapt.



http://xkcd.com/1083/

NLP is also a Knowledge Problem

Where is A Bug's Life playing in Mountain View?

A Bug's Life is playing at the Century 16 Theater.

When is it playing there?

It's playing at 2pm, 5pm, and 8pm.

OK. I'd like 1 adult and 2 children for the first show. How much would that cost?

But we need domain knowledge, discourse knowledge, world knowledge, linguistic knowledge.

What will we do?

- Language Modeling
  - Build probabilities of words and phrases
- Document Classification
  - Identify some hidden property of documents
- Sentiment Analysis
  - Learn to extract the emotion and mood from language
- Parsing
  - Identify the syntax of language
- Information Extraction
  - Automatically pull out valuable nuggets of information