

Understanding Twitter Interaction

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- Understanding human interaction:
 - human-human
 - human-computer
 - verbal
 - non-verbal
 - face-to-face
 - online



System Monitor - Travel

Graph Modules Channels Threads

aveIAM → SpeechPlan → Vocalizer (M A R Y) ← SpeechEvent

Contextualizer → Context → Vocalizer

Interpreter → Word → Typer

Typing panel: i want to go [SPEAK] [Incremental]

Parsing panel

```
[e1 : event
r2 : reftime
p3 : (e2 @ r ^ r=now)
e2 : e2 = e1
x1 : speaker
e1 : event
r1 : reftime
r : reftime
p2 : (e @ r1 ^ r,now<r1)
e : e = e1
x : speaker
p1 : go(e, x)
*p : want(e2,x1,p1)
#0:(Tty0)]
```

Phrase (Interpreter)

Lattice Edge Concept Tree

```
[e : event]
0000:(Ttyes)
XY [r : reftime
*p : (Y @ r ^ r=now)]
0001:(Ttyes→cn)
[*r : reftime]
00010:(Ttyes)
XX,XY [*p : (Y @ X ^ X=now)]
00011:(Ttyes→(es→cn), +state)
```

Matched rule [i want to go from london to paris] -> Trip

Dialogue Systems

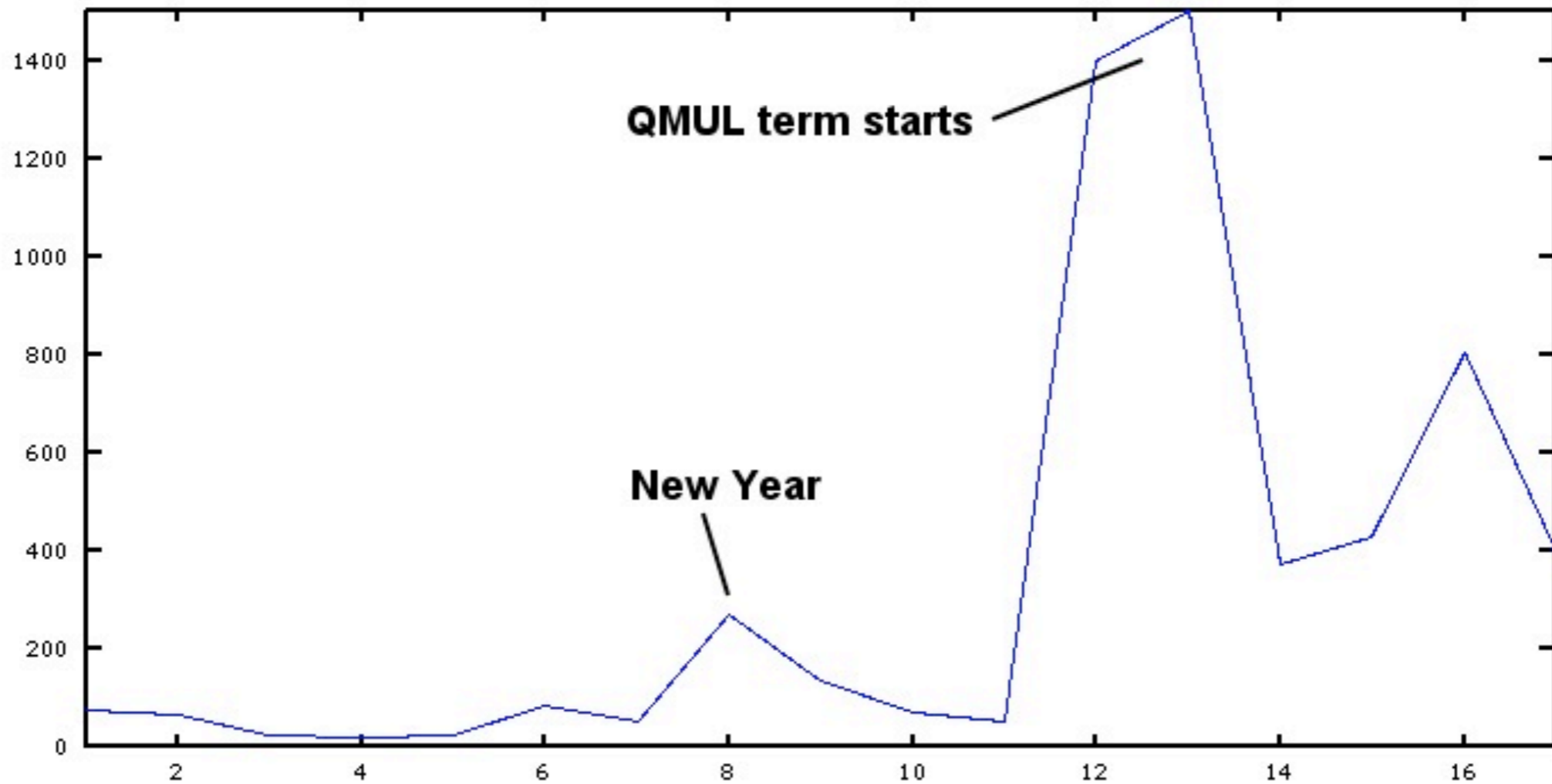


Video Interaction



Meetings

People tweet when it's snowing



Online Interaction

#uksnow Map 2.0

This app searches Twitter for real-time snow reports and displays them on the map.

Join in!

Tweet the hashtag #uksnow, the first half of your postcode, and rate the snow that is falling out of ten (0/10 for nothing, 5/10 for steady snow and 10/10 for arctic blizzard conditions).

For example: #uksnow NG9 3/10

Add your snow photo links and see them show too.

The map automatically updates every minute.

Icon key

- 7/10 or more - Blizzard!
- 5/10 or 6/10 - Steady snowfall
- 3/10 or 4/10 - Light snowfall
- 1/10 or 2/10 - A few flakes
- 0/10 - No snow :(

For easier-to-see icons, choose from the icons list above the map.

Got a suggestion or idea for the app? t.me/bmst

This is an updated version of [original app](#) from February 2009.

Crafted by [@benmarsh](http://benmarsh.com) | ben@benmarsh.com

[Check out this #uksnow app for your iPhone!](#)

Map type: **Snowfall** | Icons: **Original**

Map | Satellite | Hybrid | Terrain

Tweets


missbutbley
It had stopped snowing... only to start all over again #uksnow
Tweeted at 2010-01-13 15:41:30

iwarkow
#uksnow de74 3/10 Small flakes again!
Tweeted at 2010-01-13 15:41:21

HQ41117
@PROFF20 RT @pasingphase Fantastic Time Lapse implementation of the #uksnow map: <http://bit.ly/5Rust0>
Tweeted at 2010-01-13 15:41:09

PeterboroughAIP
We've survived the worst of the #uksnow now we think! We've come out unscathed and looking forward to the next round of requirement!
Tweeted at 2010-01-13 15:41:08

alexkuntzmann
#uksnow <http://tumblr.com/xxeif>

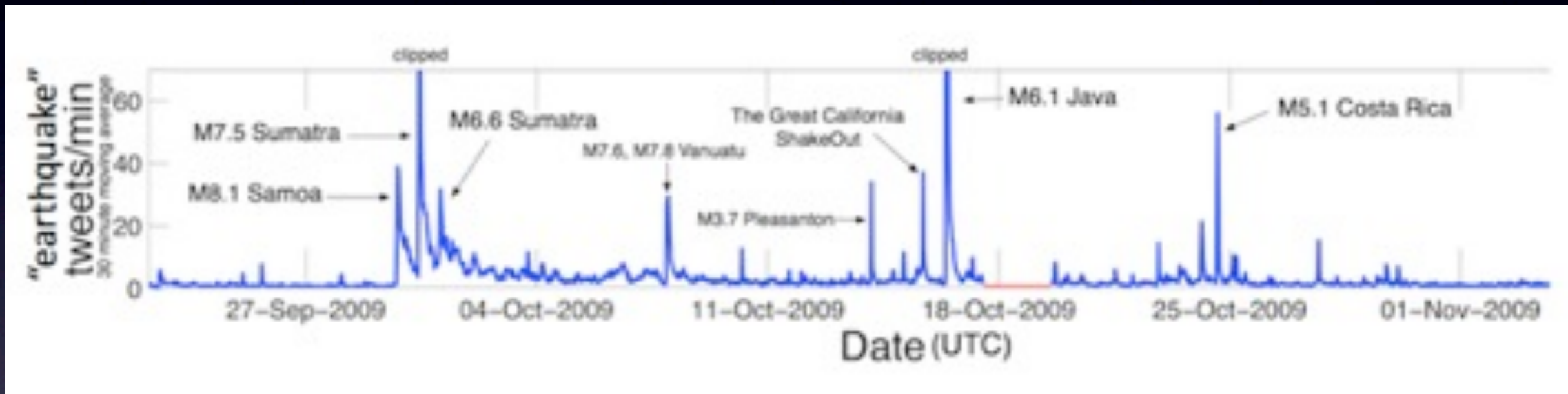


Tweeted at 2010-01-13 15:41:07

quabie
According to the #uksnow map there is a blizzard near Ipswich. Must be very localised. I can't see it. #uksnow ip8 0/10
Tweeted at 2010-01-13 15:40:59

d.h.morgan

Ben Marsh's #uksnow map



US Geological Survey

PDA

THE DIGITAL CONTENT BLOG

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[Blog home](#)

Twitter election predictions are more accurate than YouGov

A little over six weeks ago, the political internet tool [Tweetminster](#) was predicting that [Labour](#) was set to win the general election.

PDA

THE DIGITAL CONTENT BLOG

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If Twitter is right, Labour is set to win

In August 2009, alongside the traditional coverage of Japan's general election, a group of PhD graduates and engineers began analysing online

Poll prediction

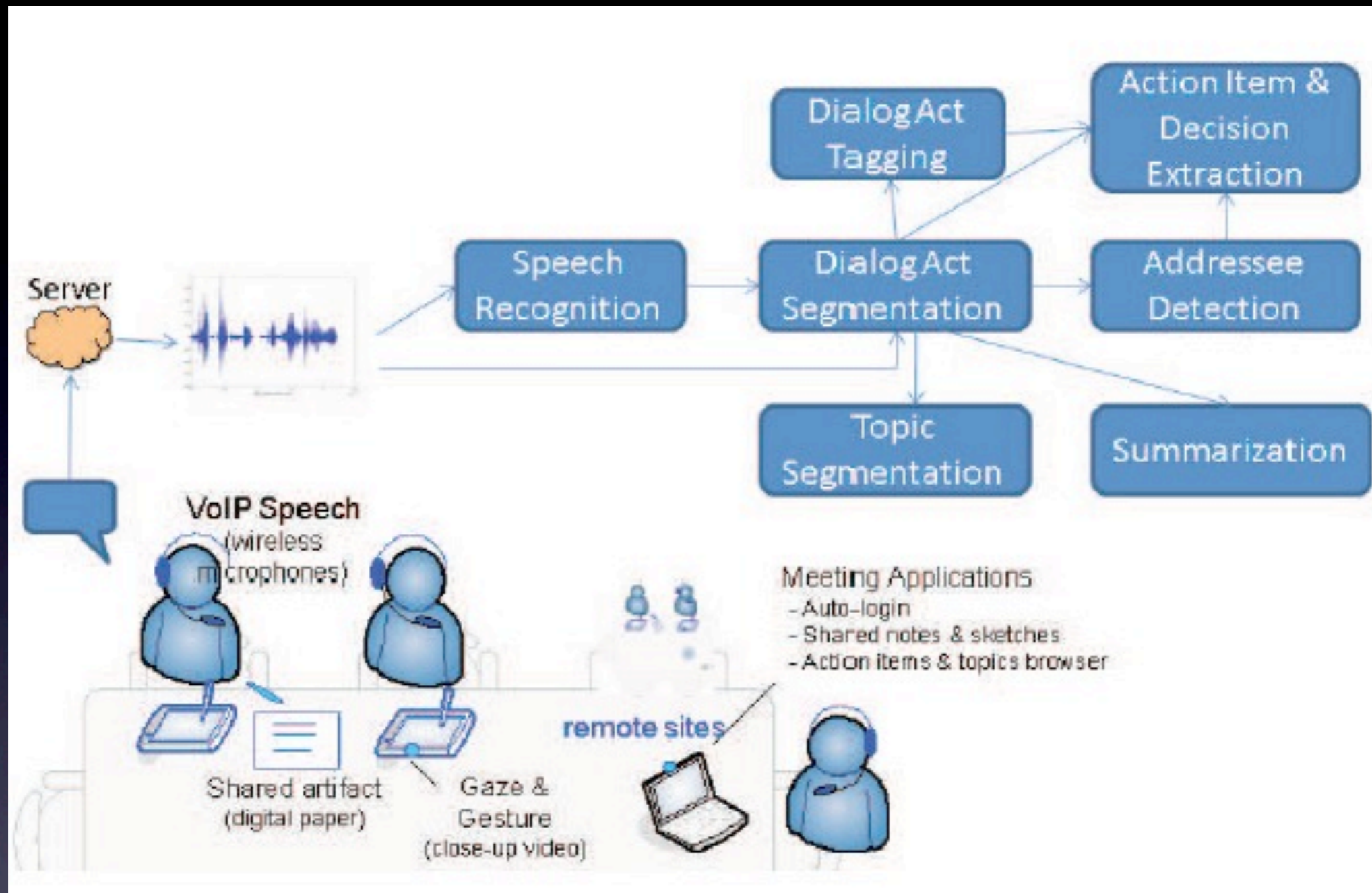
Tweets in 24 hours:

Dell	16,800
McDonalds	26,200
Ikea	4,800
UPS	45,600
Burberry	3,200

Marketing

Twitter Interaction

- Snow, earthquakes, votes:
 - volume of traffic (“buzz”)
 - (maybe combined with keyword searches)
- What if we want more than this?
 - Influence in discussions
 - Questions & answers, alternatives
 - Agreements, disagreements, consensus
 - ... needs more than buzz or keywords



Meeting Assistant

Summary	Transcript	Action Items	Topics	QA Pairs	Ink	Meeting Notes	Mark Meeting
What To Do	When To Do It	Who Should Do It	My Actions				
organizing committee	the first week of november	Melinda_Gervasio					
we should probably get a report from her so	but the plan is that	Pauline_Berry					
an action item for me would be to try to find and i'm not three to wave you know and	come back to you tomorrow	Thierry_Donneau-Golencer					
set up a meeting	next week						
to look	next week CALO suggestions (select one): next week will try oh yeah so kelly was very excited i did and on factor and so we'll try and set up something for next week as an action item you get as an action item to schedule a meeting for sometime next week transition						
the hero	be interesting	Tim_Rauenbusch					

Action Item Detection

Interaction Structure

- How do we detect decisions / action items?

SAQ not really. **the there was the uh notion of the preliminary patent, that uh**

FDH yeah, it is a cheap patent.

SAQ yeah.

CYA okay.

SAQ which is

FDH so, it is only seventy five dollars.

SAQ and it is it is e an e

CYA hm, that is good.

HHI talk to

SAQ yeah and and it is really broad, you don't really have to define it as w as much as in in a you know, a uh

FDH yeah.

HHI **I actually think we should apply for that right away.**

CYA **yeah, I think that is a good idea.**

HHI **I think you should, I mean, like, this week, s start moving in that direction.** just 'cause that is actually good to say, when you present your product to the it gives you some instant credibility.

SAQ [Noise]

SAQ **mhm.**

CYA **right.**

Interaction Structure

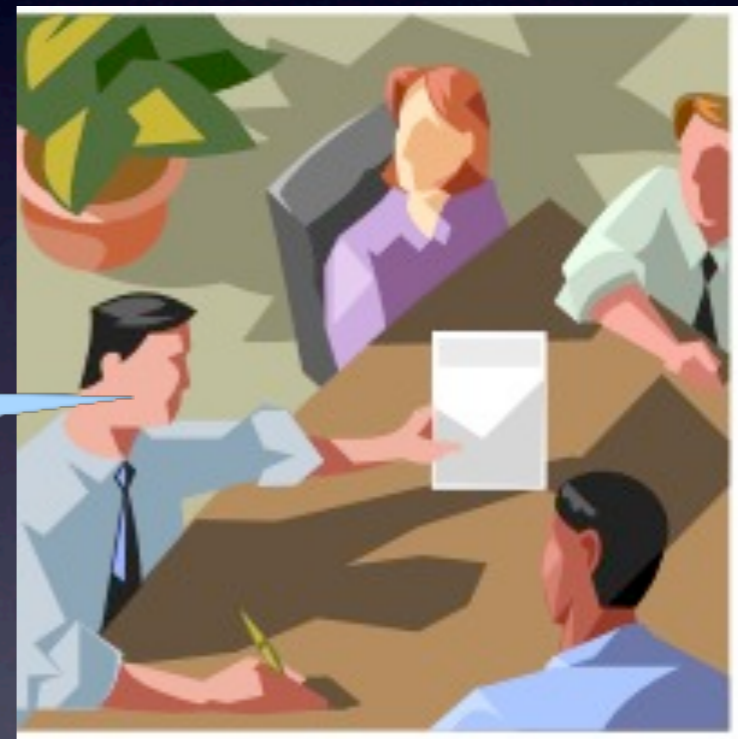
- How do we discuss tasks?



Interaction Structure

- How do we discuss tasks?
- Describe task

Somebody needs
to fill out this
report!



Interaction Structure

- How do we discuss tasks?
 - Describe task
 - Assign owner

Somebody needs
to fill out this
report!



Interaction Structure

- How do we discuss tasks?
 - Describe task
 - Assign owner
 - Define timeframe

Can you do it
by tomorrow?



Interaction Structure

- How do we discuss tasks?
 - Describe task
 - Assign owner
 - Define timeframe
 - Agree

Can you do it by tomorrow?



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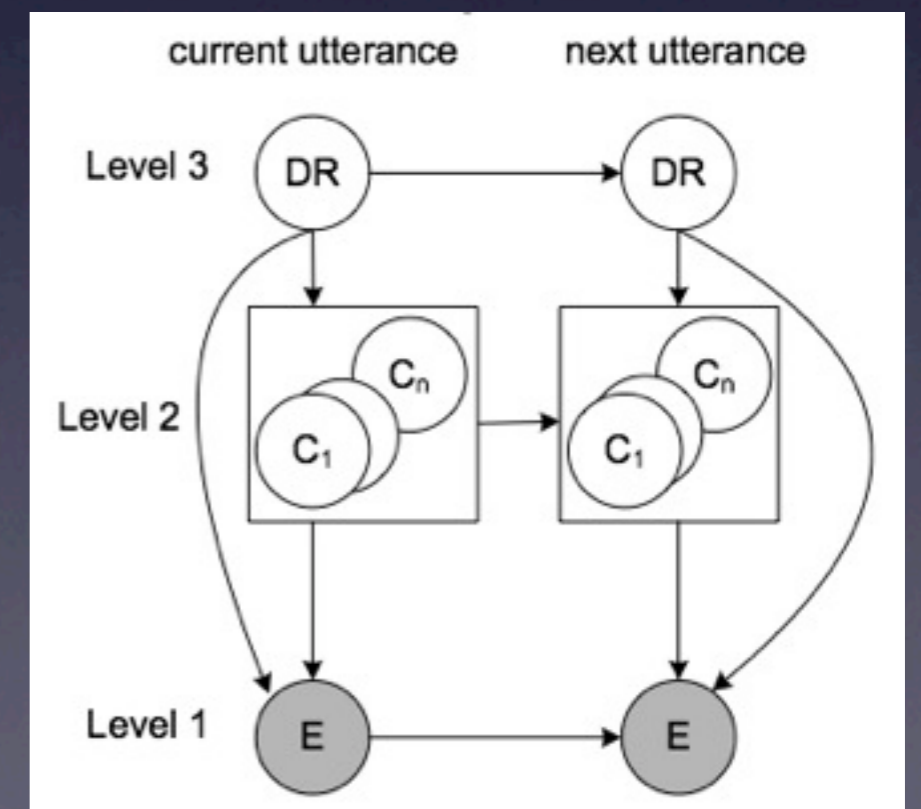
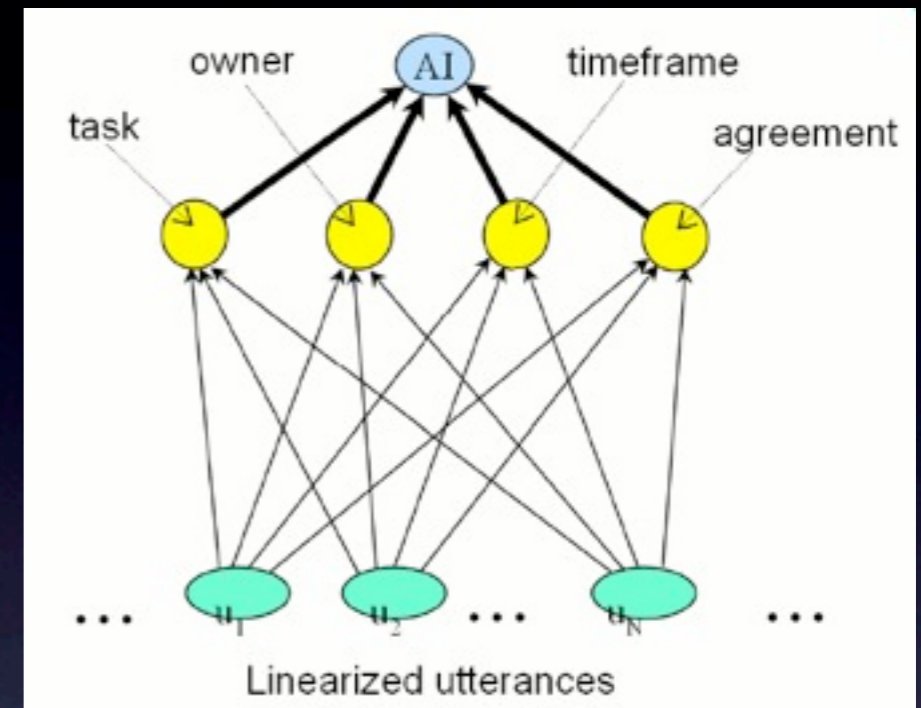
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SAQ **mhm.**
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Detecting Structure

- Detect the components
 - “dialogue acts”
 - Words, phrases, intonation, gestures, gaze direction ...
 - SVMs, decision trees, ...
- Detect the structure
 - Patterns/sequences of individual components
 - (Dynamic) Bayesian Nets



Twitter Interaction

- Snow, earthquakes, votes:
 - volume of traffic (“buzz”)
 - (maybe combined with keyword searches)
- What if we want more than this?
 - Influence in discussions
 - Questions & answers, alternatives
 - Agreements, disagreements, consensus
 - ... it’s all about the **structure** again

What are we looking for?

- What are the overall structures?
 - The jury's still out ...
- What are the building blocks (“dialogue acts”)?
 - Question, answer, accept?
 - Publish information, like/dislike?
 - Express opinions, emotions, agree/disagree?
 - (aha! can “sentiment analysis” help?)

What do they look like?

- Twitter interaction structure may be similar to face-to-face ...
- ... but Twitter language certainly isn't ...
- ... and it changes very fast.

Nyt alexx tweetdreamsh RT @JDBAustralia: Goodnight everyone, i will tweet you all tomorrow <3
#loveislouder

BIEBER ALERT! #imoldenough to say @justinbieber's new hair is FUCKING GORGEOUS

How can we detect them?

- Look for lists of keywords?
 - (most “sentiment analyzers” do this)
 - like, good, happy vs hate, bad, sad
 - How do we define the list?
 - How do we keep it updated?
 - How do we transfer it to new languages?

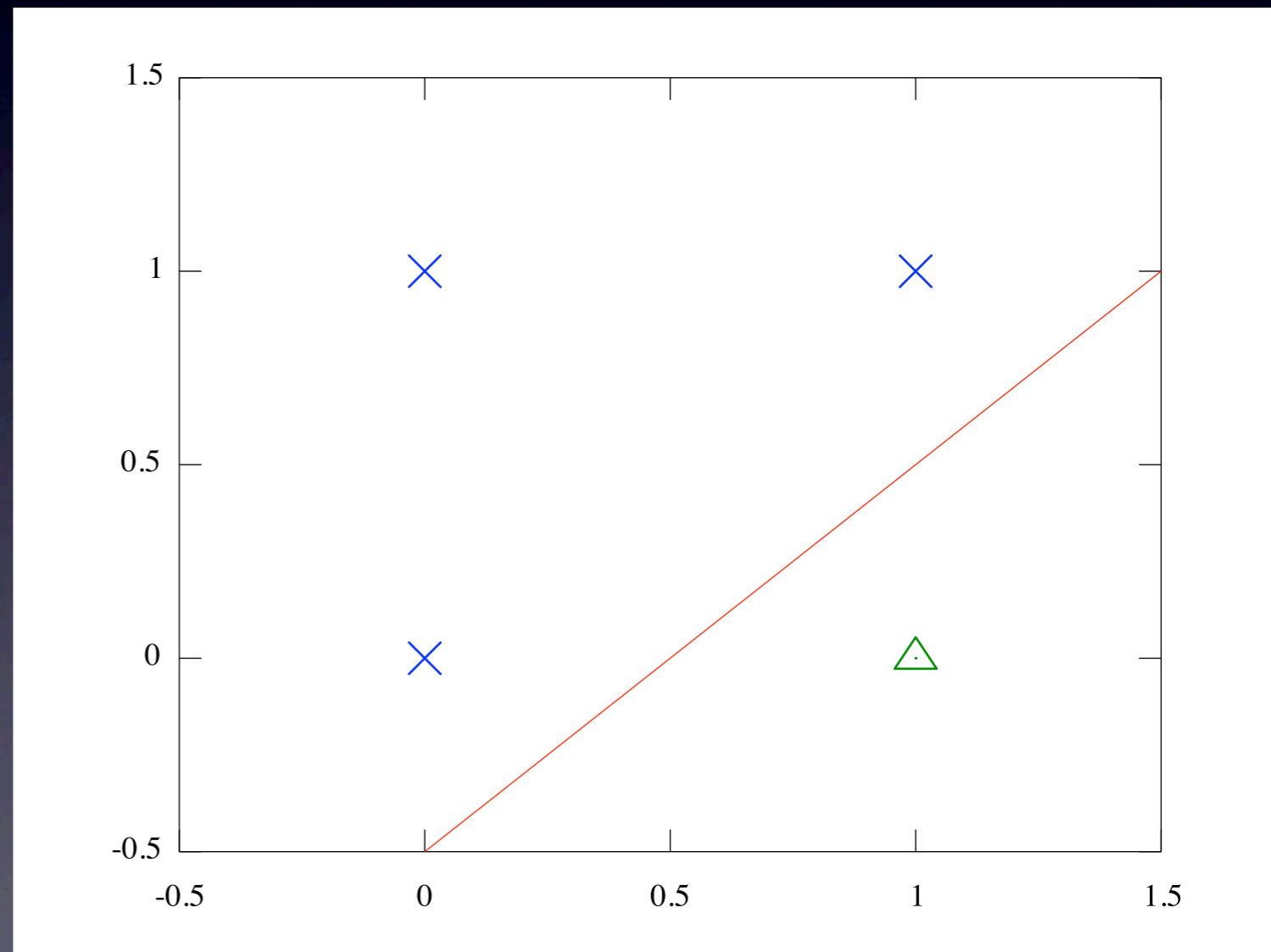
How can we detect them?

- What about these?
 - @justinbieber is bad
 - i love @justinbieber #sarcasm
 - yeah right RT @susie i love @justinbieber
- Language is complicated!
- Need to learn these automatically
- Need to learn relationships between words

How can we detect them?

- Supervised machine learning (support vector machines)
 - Give it lots of labelled data
 - Learn to predict the labels

#sarcasm



love

Labels

- Problem: we need lots of **labelled** data
- Labelling is boring, expensive and hard:

Best day in ages!

Gets so angry when tutors don't email back... Do you job idiots!

Leftover ToeJams with Kettle Salt and Vinegar chips.

- Need people to label the data themselves ...

Labels

- Problem: we need lots of **labelled** data
- Labelling is boring, expensive and hard:

Best day in ages! #Happy :)

Gets so #angry when tutors don't email back... Do you job idiots! :@

Leftover ToeJams with Kettle Salt and Vinegar chips. #stress #sadness #comfort

- Need people to label the data themselves ...

Distant Supervision

- Find reliable conventions as noisy “labels”

:) :(:@ :-P <3 (^_^) (>_<) ...

#happy #sad #fail #ftw ...

- Learn accurate models from lots of data
 - (> 80% accuracy straight away)
- Easy to adapt, cross-language (ish)
- Uses authors' own interpretation

Distant Supervision

- Do they tell us what we want to know?
 - Yes: opinions, emotions, sentiment
 - No: the labels are noisy (ambiguous, vague)

:) :-P

- Use co-training between independent labels
 - Find common meaning (semi-)automatically

:) $\xrightleftharpoons[69\%]{64\%}$ #happy

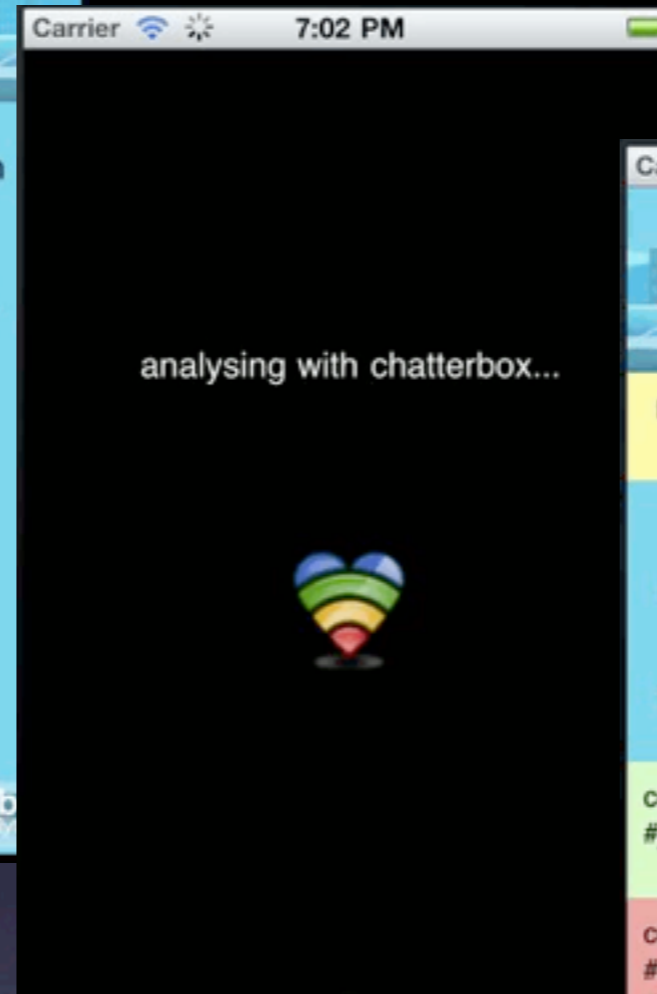
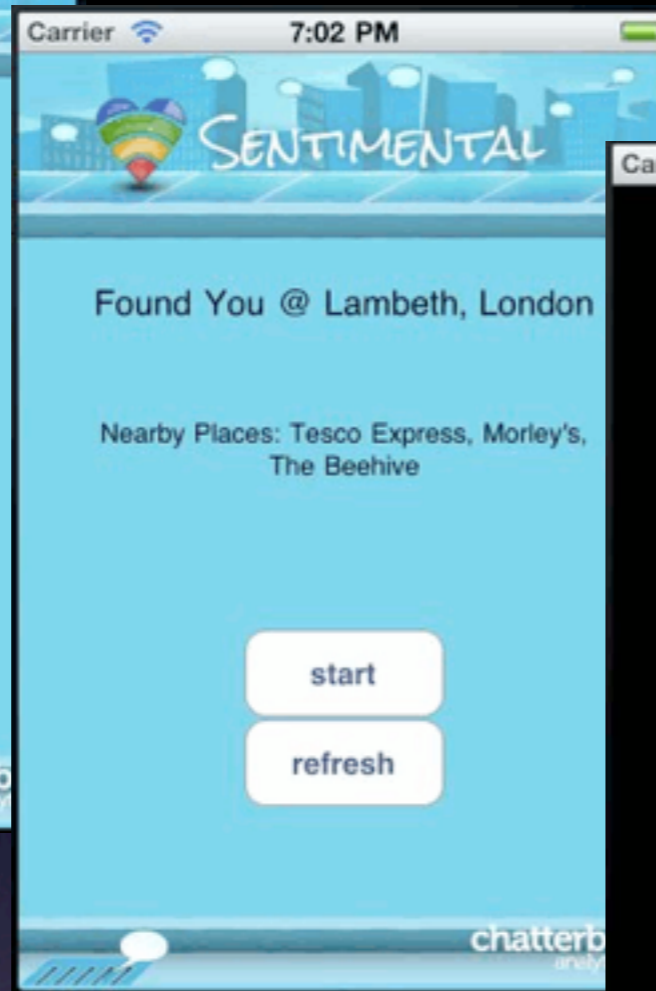
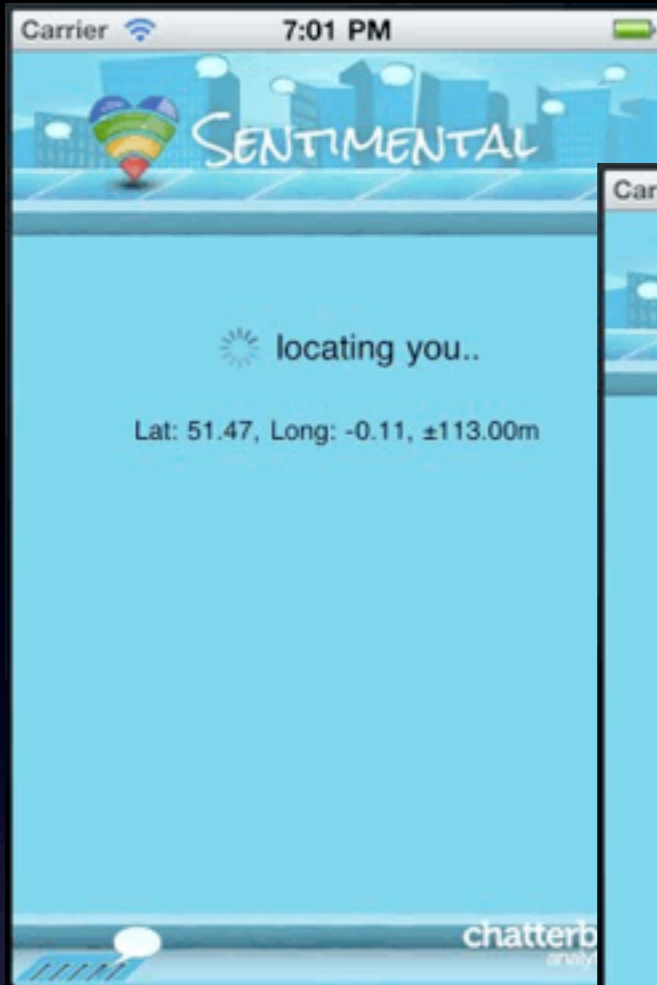
Tweet with #digitalshoreditch and spin the wheel!

chatterbox
analytics

Queen Mary
University of London



Wheel of Emotion



iPhone app: Sentimental

What's next?

- Topic analysis:
 - e.g. tweets about a mobile provider
 - liked: deals, HTC Desire, ...
 - disliked: signal, HTC Sensation, ...



What's next?

- Conversation Structure!
- understanding influence, (dis)agreement, consensus:

Vodafone said I could pay \$344 to keep phone. 6 months left on contract & my receipt said phone was \$240 over 12mths & I can pay out early

@developit I want to terminate my contract with Vodafail - their service has been shocking at best. It's going to cost me \$\$\$\$ ☹️

@macbisho lodged complaint with ombudsman on Wednesday, got txt from Vodafone saying they have agreed & cancelled contract.

@developit fantastic. What happens to your phone?

@macbisho keep it I hope. Will let u know once I have the letter

@developit complaint to TIO done :) I love how you can do it online!

@macbisho oh I didn't know about online. We still haven't heard if son has his contract cancelled. Called Vodafone but line was bad. Typical

Thank you

- Me: www.eecs.qmul.ac.uk/~mpurver
- m.purver@qmul.ac.uk / @mpurver
- IMC: www.eecs.qmul.ac.uk/researchgp/imc
- @qmulimc
- Chatterbox: www.cbanalytics.co.uk
- info@cbanalytics.co.uk / @cbanalytics