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Getting to Know Social Media Analytics

Tin Seong KAM
Singapore Management University, tskam@smu.edu.sg

Citation

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Getting to Know Social Media Analytics

Dr. KAM Tin Seong, Ph.D
Associate Professor of Information Systems (Practice)
School of Information Systems,
Singapore Management University
tskam@smu.edu.sg
Tel: 6828-0269

Linked in
twitter
Tin Seong KAM
@tskam

Content

- What is social media analytics
- Mining and visualising social media
  - Graph visualisation
  - Network analysis metrics
- SNA Case study: Event detective
- Visualising and analysing spatio-temporal patterns of social media data
- Pandemics in the age of social media

Motivation

- Rapid growth of social media
  - Facebook: 500 million users[1]
  - Twitter: 200 million users[2]

- More updates posted than ever before
  - Facebook: 7.5 billion items shared per week[1]
  - Twitter: 1 billion tweets per week[2]

[1] Facebook Press Room. Accessed 13 Apr 2011 (http://www.facebook.com/press/info.php?statistics)
[2] Twitter Blog: #numbers, 14 March 2011 (http://blog.twitter.com/2011/03/numbers.html)

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Social Media and Society

stuck in the train for an hour
10:18 AM Apr 7th via Twitter for iPhone from here

rjleong
RJ

No MRT, no taxi, now waiting for bus. C'mon, where are you?
9:47 AM Apr 7th via Twitter for iPhone from here

hendrikch
Hendrik Christian

Best so many people stuck on a train .
10:14 AM Apr 7th via Twitter for iPhone from here

thBlackcat
leon (:

East-West line MRT breakdown
7th April 2011

Via @kennylow75: political forum- PAP showed poise, SDA needs 2 B specific, SDP eager 2 fight, SPP needs help, WP is promising. #sgelections
1:19 AM Apr 3rd via TweetDeck

keenlen

after the #sgcnaforum, PAP gets even more airtime on the news. what's the point, you tell me. #sgelections
11:14 PM Apr 2nd via TweetDeck

venarse
Venus Ng

Political Forum
2nd April 2011

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What is Social Media Analytics

- Social media analytics is the practice of gathering data from blogs and social media websites, such as Twitter, Facebook, Digg and Delicious, and analysing that data to inform business decisions.

- The most common use of social media analytics is gauging customer opinion to support marketing and customer service activities.

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Social Network Analysis

- It maps and measures formal and informal relationships to understand what facilitates or impedes the knowledge flows that bind interacting units, viz., who knows whom, and who shares what information and knowledge with whom by what communication media (e.g., data and information, voice, or video communications)
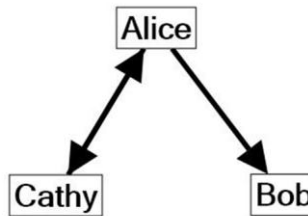

Two-mode view of the Southern Women social event dataset
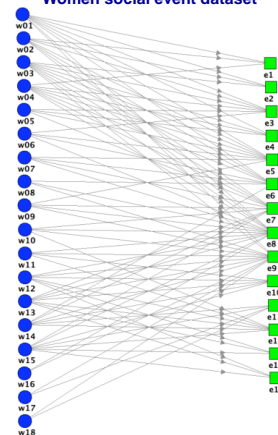
Valdis Krebs (2010) "Your Choice Reveal Who You Are: Mining and Visualizing Social Patterns" in *Beautiful Visualization*.

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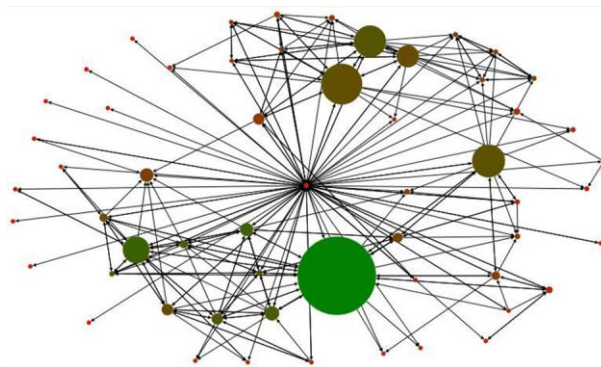
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A Simple Network Graph

- Vertices
- Edges

The Ego Network

- Greener vertices have higher eigenvector centrality, and larger vertices have higher betweeness centrality.

Social Network Metrics

- Aggregate network metrics
- Vertex-specific network metrics
- Clustering and community detection algorithm
- Structures, network motifs, and social roles

Graph Metric	Value
Graph Type	Directed
Vertices	89
Unique Edges	188
Edges With Duplicates	146
Total Edges	334
Self-Loops	48
Connected Components	3
Single-Vertex Connected Components	1
Maximum Vertices in a Connected Component	86
Maximum Edges in a Connected Component	332
Maximum Geodesic Distance (Diameter)	4
Average Geodesic Distance	2.332928
Graph Density	0.029366701
NodeXL Version	1.0.1.171

Betweenness Centrality
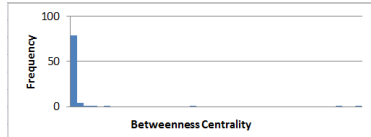
Minimum Betweenness Centrality	0.000
Maximum Betweenness Centrality	3349.837
Average Betweenness Centrality	111.843
Median Betweenness Centrality	0.000

Eigenvector Centrality
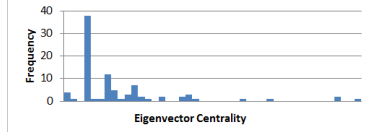
Minimum Eigenvector Centrality	0.000
Maximum Eigenvector Centrality	0.058
Average Eigenvector Centrality	0.011
Median Eigenvector Centrality	0.008

SNA of Facebook friends

- Could I figure out the social structure of my Facebook?

Vertex 1	Vertex 2	Colo
JessieSarah	HaiYenChan	
KathirJb	HaiYenChan	
Yatilshak	HaiYenChan	
WongWaiLeng	HaiYenChan	
KarenRajan	HaiYenChan	
JamaliahBinteSulaim	HaiYenChan	
JessTan	HaiYenChan	
SurianaHesheam	HaiYenChan	
HaiYenChan	GwenNgan	
MinYee	HaiYenChan	
TanWeiLingRebekah	HaiYenChan	
SherleenChong	HaiYenChan	
LimHweePing	HaiYenChan	
TinaLim	HaiYenChan	
ManicMandy	HaiYenChan	
JenWong	HaiYenChan	
LiPing	HaiYenChan	
LenaChua	JessieSarah	
KathirJb	JessieSarah	
Yatilshak	JessieSarah	
JessieSarah	JenniferOng	
WongWaiLeng	JessieSarah	
ValerieWong	JessieSarah	
JessieSarah	JessTan	
SurianaHesheam	JessieSarah	
JessieSarah	CandyTee	
LiuDan	JessieSarah	
LeoTee	JessieSarah	
JessieSarah	IllyaChipputtet	

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Tools for analysing and visualising social media network

- NodeXL, an Excel Add-in for analysing and visualising social media network
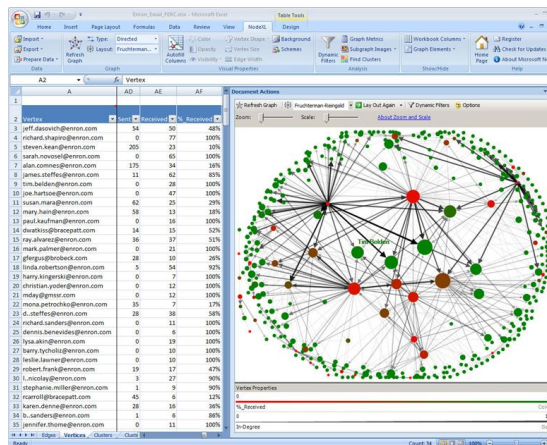
NODEXL

NodeXL: Network Overview, Discovery and Exploration for Excel

- Gephi, an open source interactive visualization and exploration platform for all kinds of networks and complex systems, dynamic and hierarchical graphs.
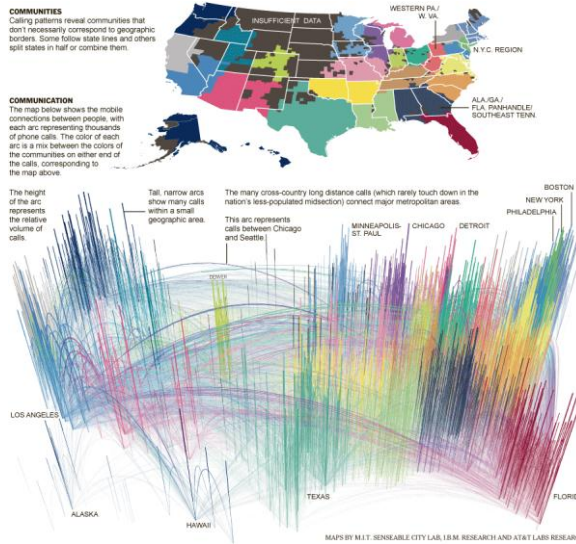
Gephi
makes graphs handy

Historical and Legal Analysis of Enron E-mail

- SNA was used to identify key individuals using content networks
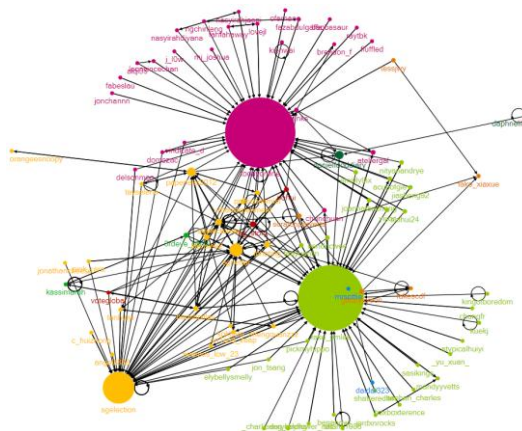
SNA for Analysing Calling Patterns

Event Detective

- Visualising and analysing the structure of connections among people discussing an event (i.e. Presidential election 2011) via social media services like Twitter.

Location-based social networking
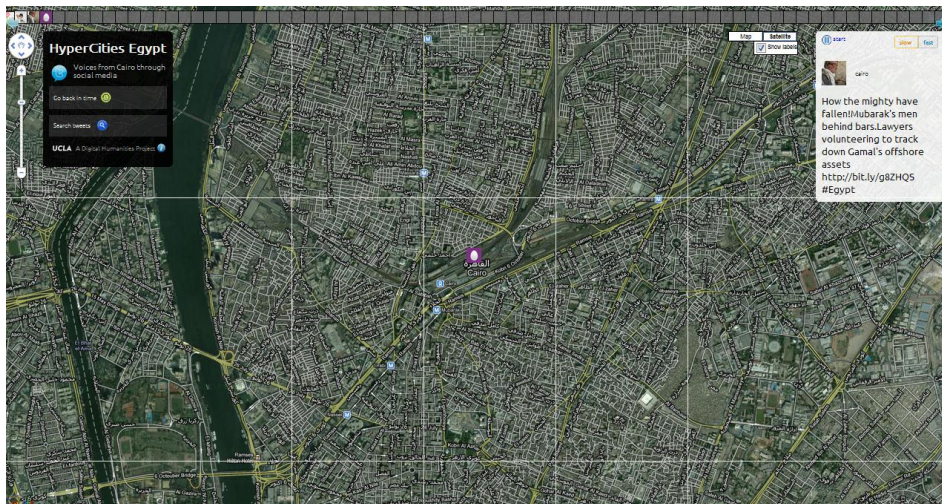

**Google Latitude
(February 2009)**

**Foursquare
(March 2009)**

**Facebook Places
(August 2010)**

HyperCities: Egypt

T. Presner, Y. Kawano, D. Shepard, UCLA Digital Humanities Collaborative (http://egypt.hypercities.com/)

Welcome to TwitterSense

- http://3.ideatransitivity.appspot.com/viz

Welcome to TwitterSense

- http://3.ideatransitivity.appspot.com/playback
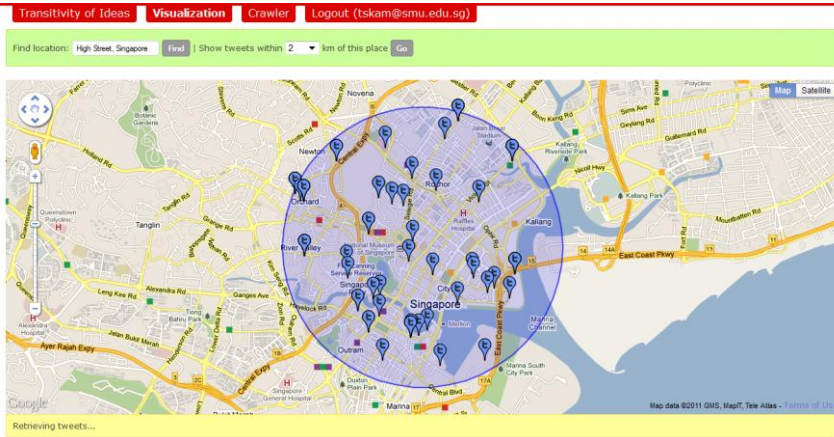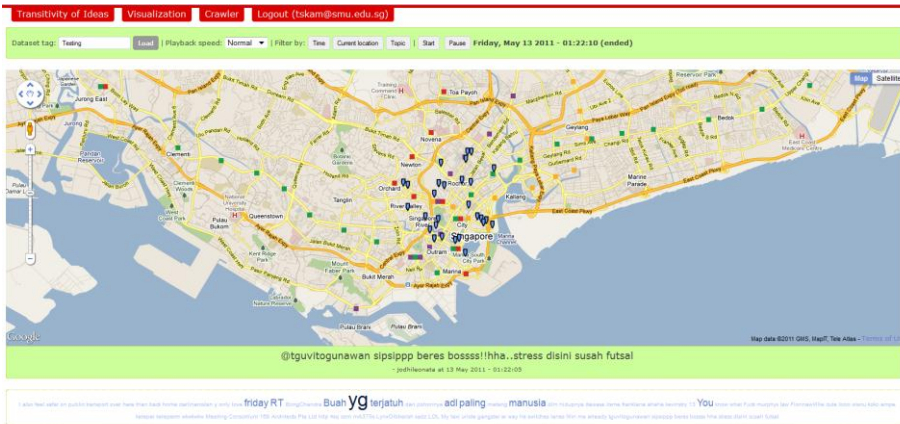
GeoTweets on GE2011 polling day

- 21,180 Tweets, 5810 with #sgelection

| TWEET ID	AUTHOR ID	TEXT	POST DATE	LAT	LONG
ID: 66638	linkedinevents	New Event: IFAI Expo Asia 2012. A world-class exhib	07/05/2011 7:01 AM	1.28944	103.85
ID: 66638	SkavengR	Redbull for breakfast.	07/05/2011 7:01 AM	1.30391	103.850363
ID: 66638	darlingmonkey	Whole night spend looking at YouTube vids! Haven't	07/05/2011 7:02 AM	1.31234	103.878176
ID: 66639	chrisWALAOE	@edgarteo yucks	07/05/2011 7:03 AM	1.40191	103.744425
ID: 66639	pradhanaaawr	RT @ditariyani: Happy saturday morning. Be a nice	07/05/2011 7:03 AM	1.37686	103.939076
ID: 66639	lovefromcharl	@ the airport with my double shot caramel macchiat	07/05/2011 7:03 AM	1.35482	103.988021
ID: 66639	ImAnnaMaldita	@edikenkoy @nornlim hello beautiful souls.. Morning	07/05/2011 7:04 AM	1.30548	103.831125
ID: 66639	Vivienneeluv	Voting starts in an hour's time.. Therefore I'm up.. So	07/05/2011 7:04 AM	1.34221	103.9518
ID: 66639	_lass	is back. To the polls we go. (@ Terminal 3 w/ 11 oth	07/05/2011 7:04 AM	1.35616	103.987033
ID: 66639	ImAnnaMaldita	@edikenkoy san ka punta? Haha! Dala ka rosaryo.	07/05/2011 7:05 AM	1.30548	103.831125
ID: 66639	chrisWALAOE	This month really no luck- meaning no money. Sigh	07/05/2011 7:06 AM	1.40191	103.744425
ID: 66640	ziang_	I'm at Blk 9 Telok Blangah Crescent http://4sq.com/j	07/05/2011 7:07 AM	1.27731	103.819232
ID: 66640	Garion_gr	I'm at Jurong East MRT Interchange (NS1/EW24) (1	07/05/2011 7:08 AM	1.33378	103.741837
ID: 66640	Ms_Masiah	Mrng---u too happy week-n :) RT @meyca_wish: T[?o	07/05/2011 7:08 AM	1.32244	103.91529
ID: 66640	ErlandAng	Setuju ! RT @IndoSpurs: RT @GOAL_ID: m.goal.co	07/05/2011 7:09 AM	1.33943	103.708051
ID: 66640	ErlandAng	Rajin amat dah bangun pagi2 :D RT @fabfabfeb: sle	07/05/2011 7:09 AM	1.33943	103.708051
ID: 66640	benleong84	@LANNNYAN @gabbyann2188 @pearlynyeo @jdch	07/05/2011 7:09 AM	1.27276	103.825112
ID: 66641	Garion_gr	Going for my basic theory evaluation now - wish me l	07/05/2011 7:10 AM	1.33366	103.741324
ID: 66641	shiockshock	It was a hell of a great night til the parking ticket cam	07/05/2011 7:11 AM	1.43005	103.772206
ID: 66641	nicholastardo	Let's go work! Running HD energy! (High Drain) >	07/05/2011 7:11 AM	1.42561	103.834884
ID: 66641	YuuJingg	@_yeolcheeks Happy birthday! ^o^v	07/05/2011 7:11 AM	1.37141	103.949626
ID: 66641	ErlandAng	I need to sleep now... http://myloc.me/jO4Fi	07/05/2011 7:13 AM	1.33916	103.706466
ID: 66641	NaadhiaC	Woah-we-4sibling sleep tgt in the aircon rm since y	07/05/2011 7:13 AM	1.34433	103.758497
ID: 66642	I_AmStillAlive	Long day ahead therefore early night for now Zzzzzz	07/05/2011 7:15 AM	1.28144	103.824436
ID: 66642	esmesepheria	Byeeeeee Singapore! Gonna go meet our favourite b	07/05/2011 7:15 AM	1.33573	103.981918
ID: 66642	esmesepheria	Bye Singapore too!!! "@haemeimei: Bye singapore!	07/05/2011 7:15 AM	1.33194	103.987521
ID: 66642	esmesepheria	@poxinyi @solanabernita @kevinzephaniah byebye	07/05/2011 7:17 AM	1.33277	103.987582

Geographic visualisation

- This dot map showing the spatial patterns of tweets on GE2011 polling day

Geographic Visualisation of Tweets on GE2011 Polling day
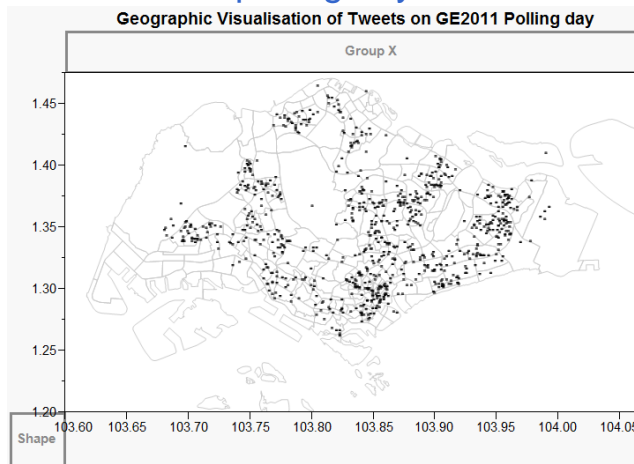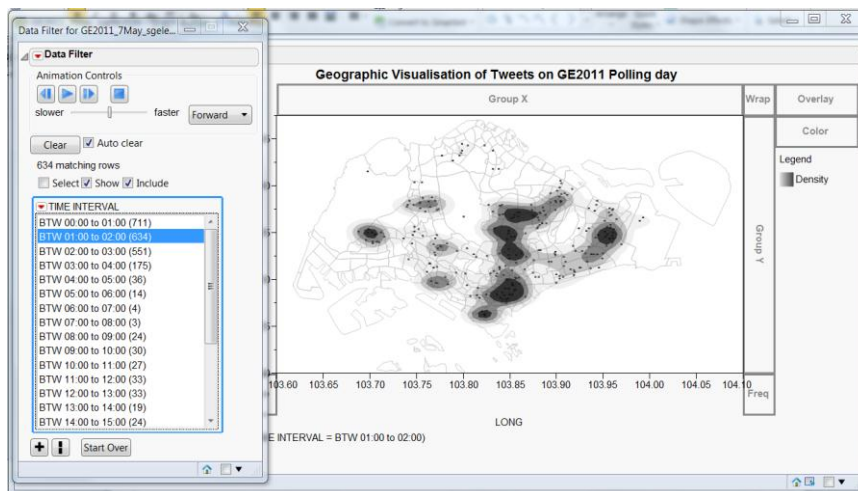
Animated map

- Animation and interactive slider are used to detect spatio-temporal patterns
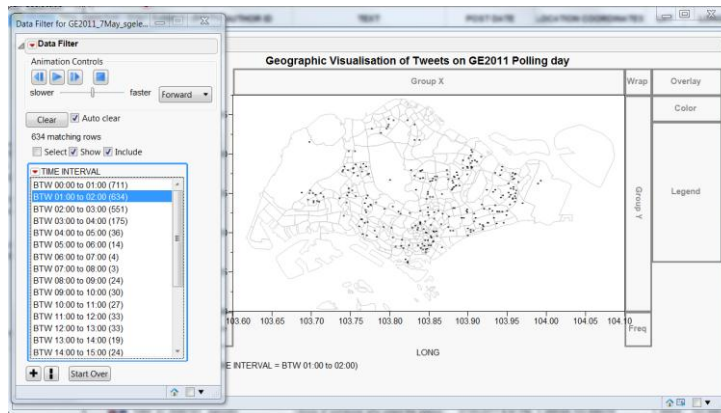
Density map

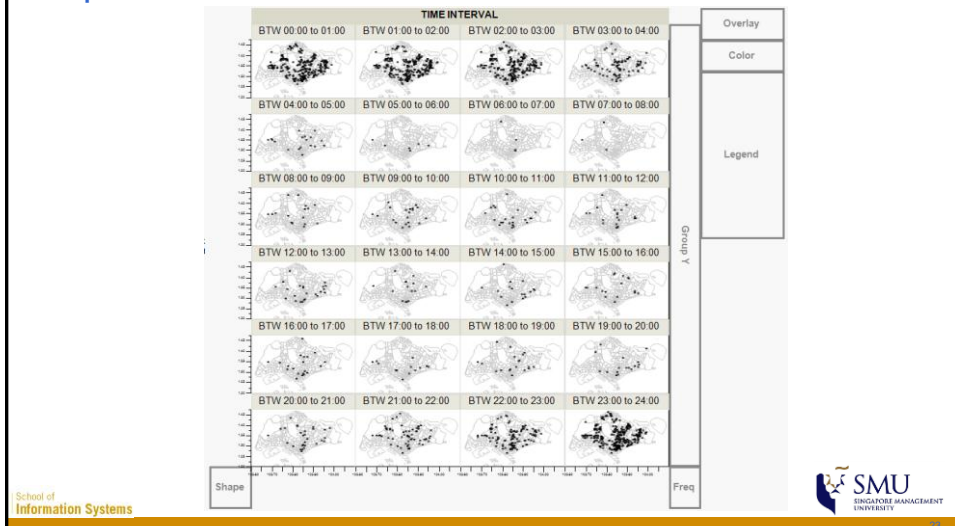- Hotspots can be detect easily with density map

Trellis data visualisation

- The data visulisation shows the spatio-temporal patterns of the tweets.

## Pandemics in the Age of Social Media

- To visualise and detect the spatio-temporal patterns of the epidemic spread
- Is the outbreak contained? Is it necessary for emergency management personnel to deploy treatment resources outside the affected area?

Geotagged Twitter data

- A total of 1,023,077 between 30/04/2011-20/05/2011

	ID	Created_at	Lat	Long	text
1	3	5/18/2011 13:26	42.22717	93.33772	this convention filled with technology could be better don't plan on leaving anytime soon
2	3	5/10/2011 9:22	42.18881	93.35642	4 orang top scorer skrg 3 di antara nya pake adidas F50 adizero Lightest fastest deadliest.
3	3	5/14/2011 9:22	42.22479	93.35922	Nike 'gana' el Mundial al patrocinador oficial Adidas // y eso que sus figuras fueron un fracaso rotundo...
4	3	5/6/2011 9:22	42.2469	93.32527	Positiiff mau nabung beli kaos adidas asli muller ... * basii bgt baru nabung skrg ya hahaha
5	3	5/19/2011 9:22	42.2354	93.35642	I kick it like Adidas
6	3	5/12/2011 9:22	42.27167	93.42951	adidas vs puma en managment tv. Muy interesante !
7	3	5/4/2011 9:22	42.29319	93.28173	Old head walked in with a kangol on backwards and to the side 2 gold braclets gold watch gold necklace prada shades adidas suit
8	3	5/13/2011 17:21	42.2838	93.47745	unsure if I will ever feel comfortable flying again... Looking at a plane that head first in the dirt
9	3	5/18/2011 7:18	42.2699	93.42632	My secretary smells like gucci mmmmmmmmm
10	3	5/9/2011 7:18	42.22331	93.3728	Talkin bout christmas dinner with my momma I'm excited for it now <3 hehe
11	3	5/1/2011 7:18	42.21624	93.48623	Up and Running going to be sharing some insight from my experience as an email marketer. Tweeting more soon.
12	3	5/9/2011 7:18	42.28818	93.42432	Gon in 60secs is a BAD ... Talkin bout mans hackle ... My days ... If eye-tay an cartier was ea they wud be chokin on der 1dips ...
13	3	5/6/2011 7:18	42.2469	93.34524	Somethins gotta give b4 I looose my mind o_O
14	4	5/20/2011 20:28	42.2183	93.38957	Christian has caught a pneumonia home is where they are staying for their sake
15	4	5/5/2011 7:22	42.24513	93.46506	These old people behind me thinkk that starbucks is the greatest thing ever haha!
16	4	5/20/2011 7:22	42.2926	93.25497	Had Starbucks three times today..
17	4	5/13/2011 7:22	42.16877	93.40755	Skinny Cinnamon Dolce Latte from Starbucks making this long ass day more tolerable #christmasinacup
18	4	5/5/2011 7:22	42.24189	93.49262	Got starbucks and got all my school supplies. Its been a good weekend but schools tomorrow :'(
19	4	5/11/2011 7:22	42.21211	93.38398	9. Lemon Cake from starbucks
20	4	5/11/2011 7:22	42.22095	93.28413	Were like starbucks on steroids haha
21	4	5/15/2011 7:22	42.23982	93.35323	Preciso urgentemente de Starbucks.
22	4	5/18/2011 7:22	42.22213	93.35682	Yessss pumpkin spice lateess are back at starbucks therefore it's
23	4	5/11/2011 7:22	42.25309	93.31608	The Move Might Be Starbucks ;pp
24	4	5/3/2011 7:22	42.20651	93.21383	is at starbucks where is everyone else??
25	4	5/8/2011 7:22	42.28877	93.41953	Starbucks then hectors house:)
26	4	5/12/2011 7:22	42.23746	93.36241	[inaudible]...bc i don't care as much abt my purity
27	5	5/7/2011 22:34	42.21122	93.34404	No sabia que venia Train al Pop Music festival ya me veo cantando Heeey Soul Sister
28	5	5/20/2011 17:20	42.28995	93.39436	chocolate infusions! truffles! lovely sunday
29	5	5/16/2011 17:20	42.25781	93.40155	Beautifulsaint is making chocolate brownies...yummiiieee!!! :) halla if u want a square its only free today..happy sunday ya'll.
30	5	4/30/2011 17:20	42.29997	93.51099	Lazy Sunday while Ms gone to work lol! Duvet day on the settee watching hollyoaks n eating chocolate puddin yumyum

Visualising and detecting spatio-temporal patterns (I)
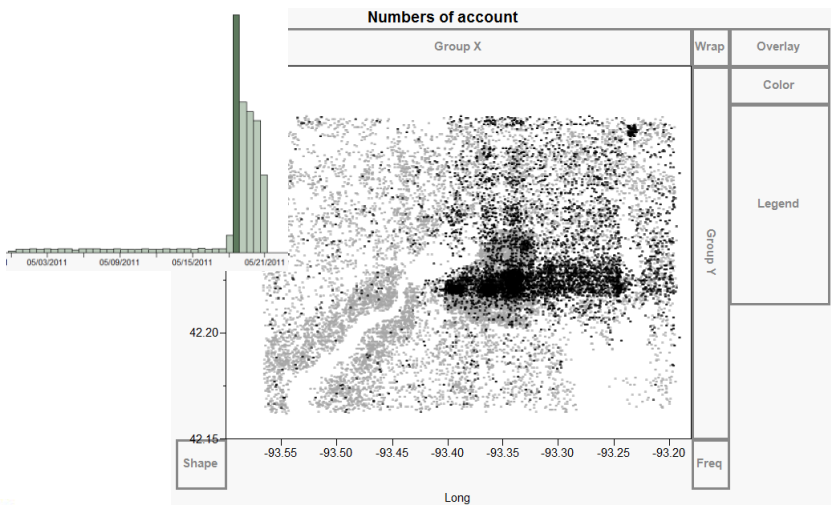
Visualising and detecting spatio-temporal patterns (II)
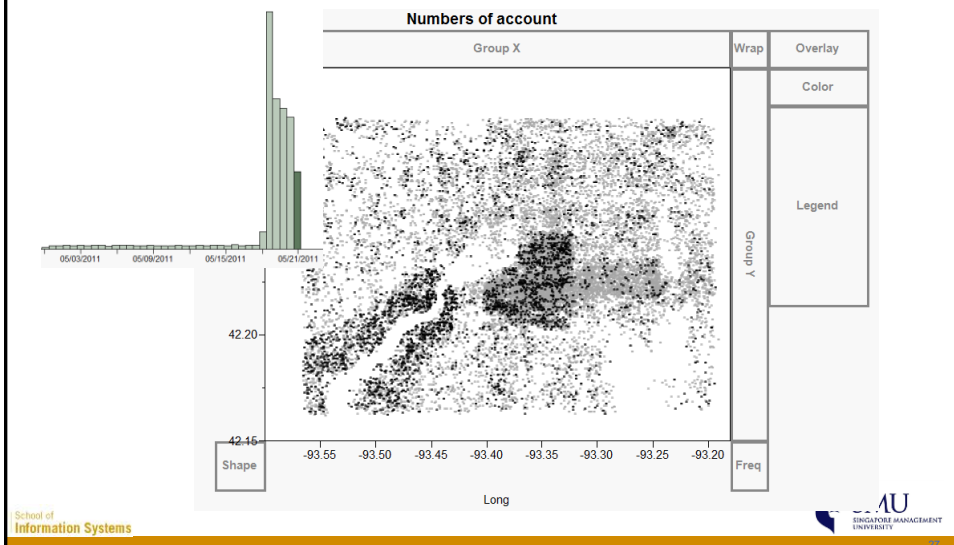
In Conclusion

- Social media analytics can be fun!
- You shouldn't have to be a statistician to get information from your data
- Interactive and visual analytics approaches empowering everyday data analysts
- Visual analytics is more than computer graphics. It's an entirely different way of approaching data: It's dynamic, it's interactive, and it's visual.