

What Can Search Tell Us? A Human-Centered Perspective



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YAHOO!

A young child with curly hair, wearing a bright red jacket and dark pants, stands on a dark, rocky shore looking out over a large, turquoise lake. The lake is surrounded by steep, forested mountains. In the distance, a valley is filled with snow and ice, with a small town or village visible. The sky is overcast and grey.

I. What is Search?

Information Retrieval

Information Retrieval

Information Interaction

Search

- Trying to find something or someone
- By seeking carefully, scrutinizing thoroughly

*from late Latin **circare** 'go around,' from Latin **circus** 'circle.'*

**NOT
A
Punctual
Activity!**

More than a query and a click

**It is a series of activities
around a specific goal**

BUT

**We often get distracted, our
“goal” is often not specific,
and we frequently change
goals during the search
process**

look for, seek, forage for, fish around/about for, look high and low for, ferret around/about for, root around/about for, rummage around/about for, cast around/about for, look through, hunt through, explore, scour, rifle through, go through, sift through, comb, go through with a fine-tooth comb; turn upside down, turn inside out, leave no stone, examine, inspect, check, frisk, hunt, look, quest, pursuit, manhunt, searching for, hunting for, seeking, looking for, on the lookout for, in pursuit of.

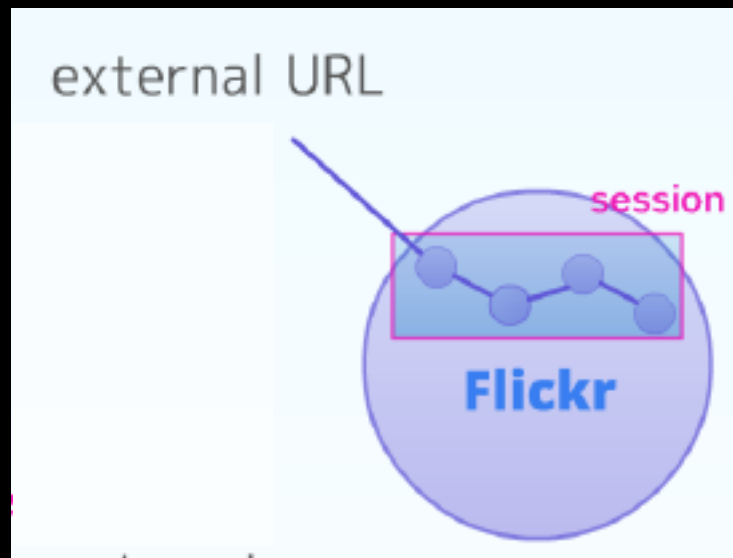
I. In order to *really* support search, we need to consider its complex, practical aspects

Main Points

- Not single query
 - Not single session
 - Context (implicit, explicit, internal, external)
-

[ICME 2012]

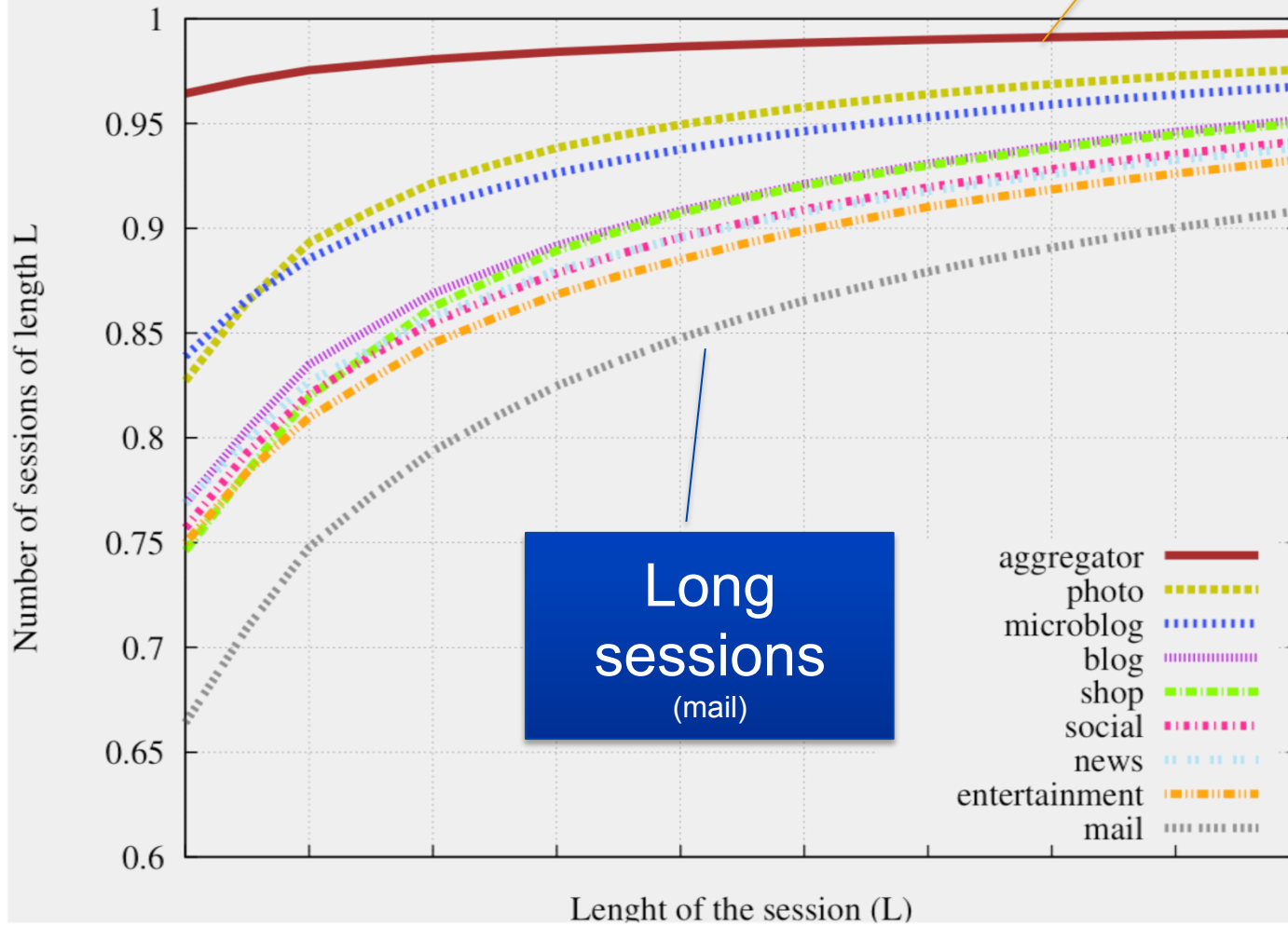
Does in-network behaviour depend on how users “enter” the network?



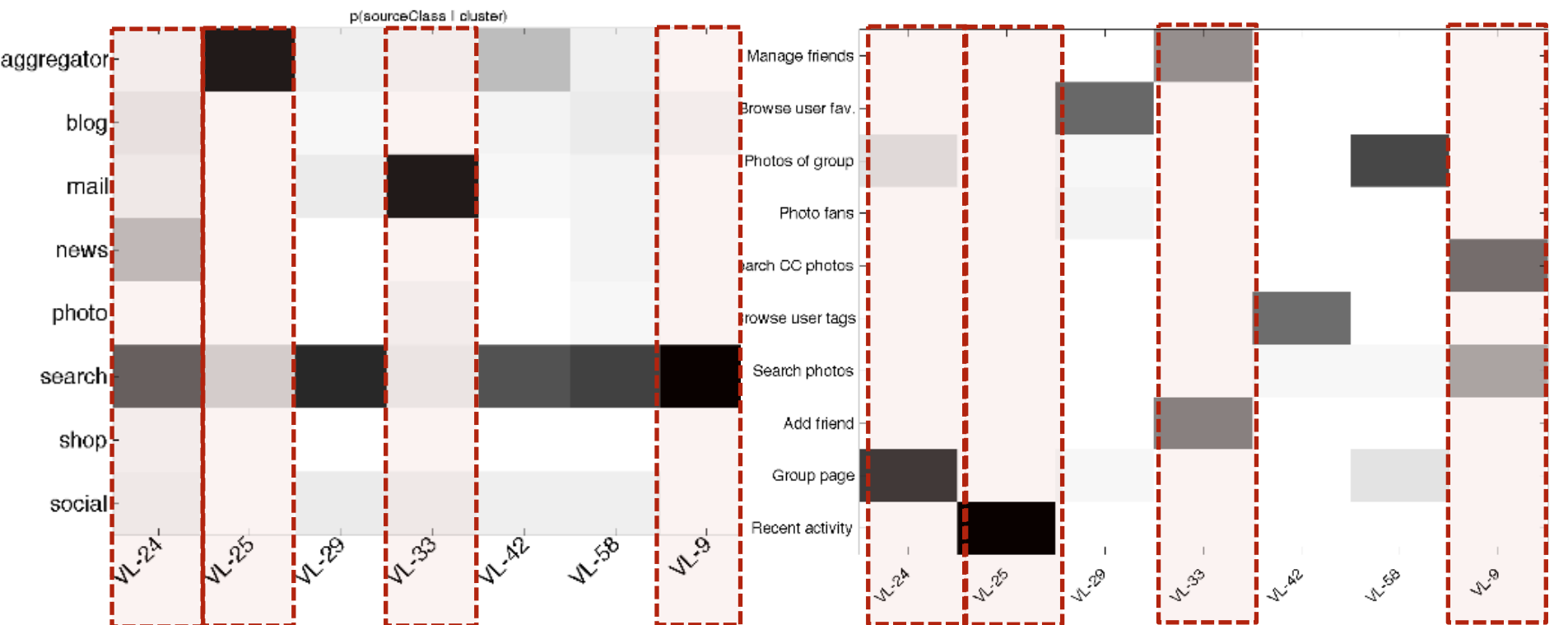
**Can we find patterns for
different categories (e.g., social,
search, aggregators, etc.)?**

Session Length

Short sessions
(aggregators)



Clusters



Main Observations I

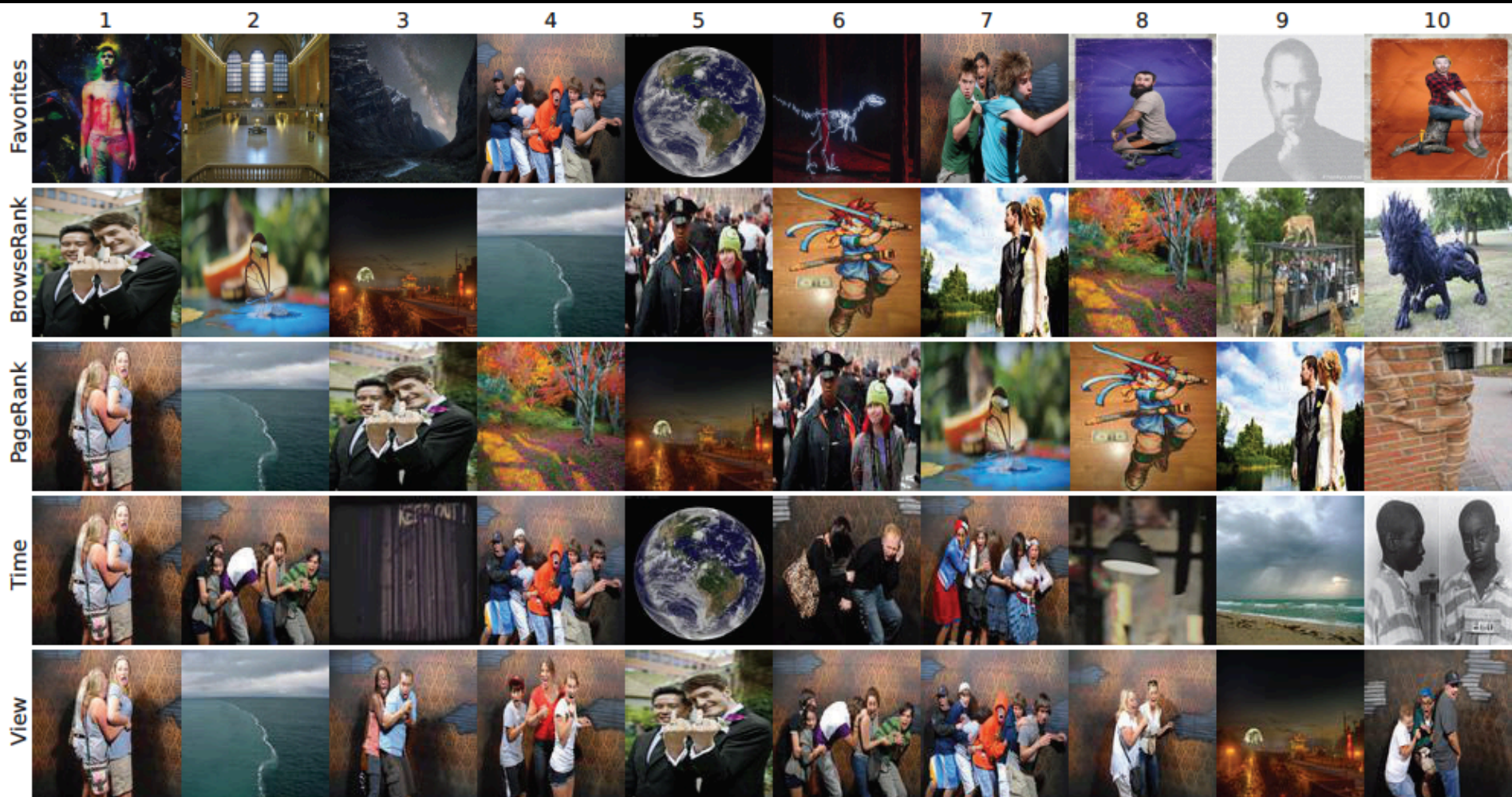
- The entry point of a user influences her behaviour
 - Session length
 - Type of page visited
 - Actions taken
 - Engagement

Main Observations II

- Mail
 - Longer sessions
 - Strong focus on managing contacts
- Search
 - Search task “moves” to Flickr
- Aggregators
 - Short sessions
 - Image browsing

[SIGIR 2012]

We compare different ranking methods



II. How Can Search Analysis Be Useful?

Five Dimensions

- Personal (Personal Information Management)
 - Algorithmic (improve results)
 - Consumer activities
 - Design (user experience)
 - Macro (marketing and social aspects)
-

Personal Information Management

- Decision making
 - Discovery
-

Algorithmic

- Ranking
 - Better results (quality, relevance)
-

Consumer Activities



Design

- User experience
-

Yahoo! Image Search

YAHOO!

Search

WEB IMAGES VIDEO LOCAL SHOPPING NEWS MORE

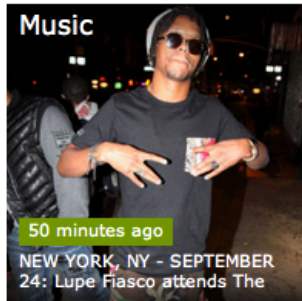
Latest in Images

Sports



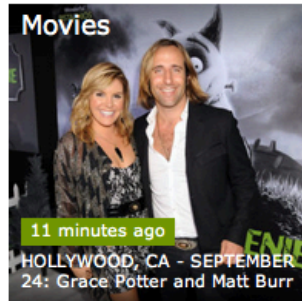
19 minutes ago
MELBOURNE, AUSTRALIA - SEPTEMBER 25: 2012

Music



50 minutes ago
NEW YORK, NY - SEPTEMBER 24: Lupe Fiasco attends The

Movies



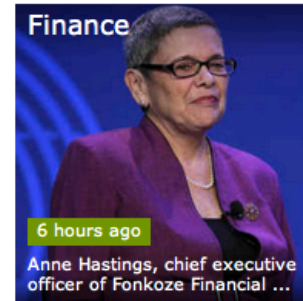
11 minutes ago
HOLLYWOOD, CA - SEPTEMBER 24: Grace Potter and Matt Burr

Politics



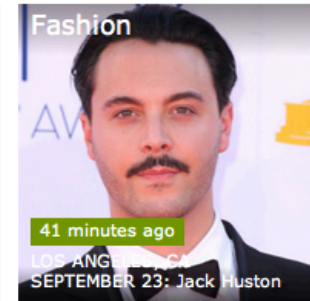
56 minutes ago
FILE - In this Sept. 3, 2008, file photo, Chris Collins of B...

Finance



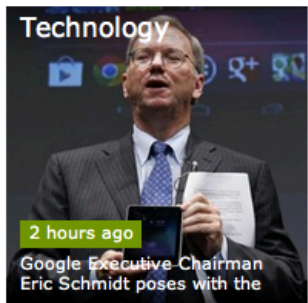
6 hours ago
Anne Hastings, chief executive officer of Fonkoze Financial ...

Fashion



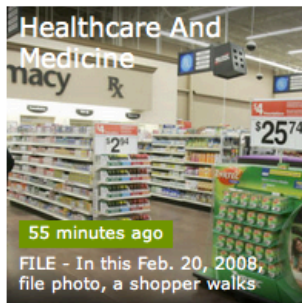
41 minutes ago
LOS ANGELES, CA - SEPTEMBER 23: Jack Huston

Technology



2 hours ago
Google Executive Chairman Eric Schmidt poses with the

Healthcare And Medicine



55 minutes ago
FILE - In this Feb. 20, 2008, file photo, a shopper walks

Terrorism



5 hours ago
Britain has vowed to hand over radical Muslim preacher Abu

Emergencies and Disasters



Year	Arrivals
2007	360,350
08	374,661
09	378,712
10	448,769
11	544,985

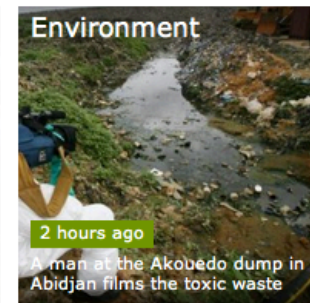
1 hour ago
Graphic charting international tourist arrivals in Nepal 200...

People



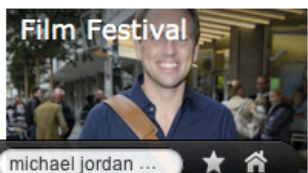
20 minutes ago
MELBOURNE, AUSTRALIA - SEPTEMBER 25: Cameron

Environment



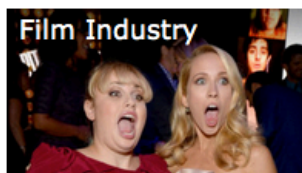
2 hours ago
A man at the Akobedo dump in Abidjan films the toxic waste

Film Festival

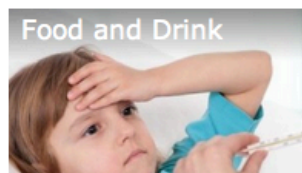


michael jordan ...

Film Industry



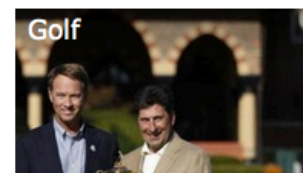
Food and Drink



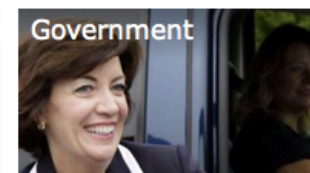
Formula One



Golf



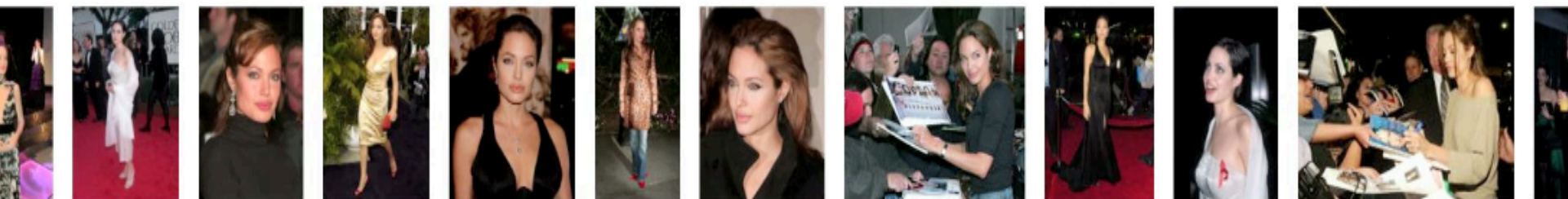
Government



[MM 2012]

Parallel Search

↔ Angelina Jolie Arts Culture and Entertainment



EDIT

↔ Angelina Jolie People



EDIT

↔ Brad Angelina Jolie People



EDIT

↔ Angelina Jolie Politics



PRISMA YAHOO!

Search for images

SEARCH

ORGANIZE

BY TOPIC 

BY COLOR 

BY LOCATION 



Macro

- Social aspects
 - Marketing
-

[WSDM 2011]

Search Behavior [with Ingmar Weber]

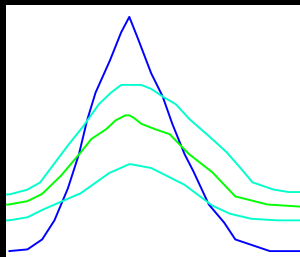
- 2.3 million “active” registered web search users
- US Census data (2000)
- Anonymous, aggregate analysis
- Who? What? How?

Results I

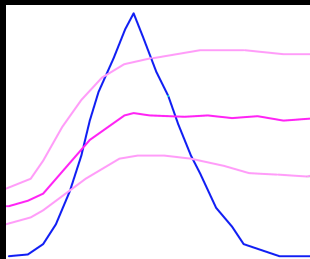
- “Baby boomers”: older users, business & finance, more navigational
- “Liberal females”: women, shopping, more likely to have voted Obama, longer sessions
- “White conservatives”: older men, auto, business, cons. Electronics, less navigational
- “Challenged youth”: younger, lower income, music, more navigational

Results II (w/Ingmar Weber, CIKM '10)

- “sonia sotomayor”
 - hispanic -> everybody (burst) -> hispanic



- “avatar movie”
 - young/male -> everybody (burst) -> everybody



Yahoo! Clues (<http://clues.yahoo.com>)

New User? Register | Sign In | Help | Feedback

Make Y! My Homepage

Yahoo! Mail My

YAHOO! CLUES Beta

Search

Web Search

HOME

TOP TRENDS

TREND ANALYSIS

HELP

Top Trends

Reset All



Time

< Jun 13, 2011 Today >

Number of months 1

Day Week Month Year

Gender



Age

All

Below 24

25 to 34

35 to 44

45 to 54

55 to 64

Above 65

Location

Most Popular Search Queries

Filters Jun 13, 2011 to Today Countries

1 india

2 philippines

3 iran

4 china

5 japan

1 india

India's Nifty Stock Futures Advance as Valuations ..., Bloomberg

India's Infosys posts profit rise but shares fall, AFP

India Official: Last Fiscal Year Power Transmissio..., Nasdaq



2 philippines

Philippines: No word from 2 Americans' abductors, Boston Herald

Philippines says China sea claim shaky, AFP

Earthquake Off Philippines Measuring 6.2: Official..., ThirdAge



3 iran

Yahoo! Clues (<http://clues.yahoo.com>)

New User? Register | Sign In | Help | Feedback

Yahoo! Mail My

YAHOO! CLUES Beta

Search

Web Search

Find Trends

angelina jolie



Compare with ... (optional)



Discover

Time



Today Past 7 Days Past 30 Days Apr 13

Popular Searches

▼ Today

alison krauss

courtney cox

katherine jenkins

applebees

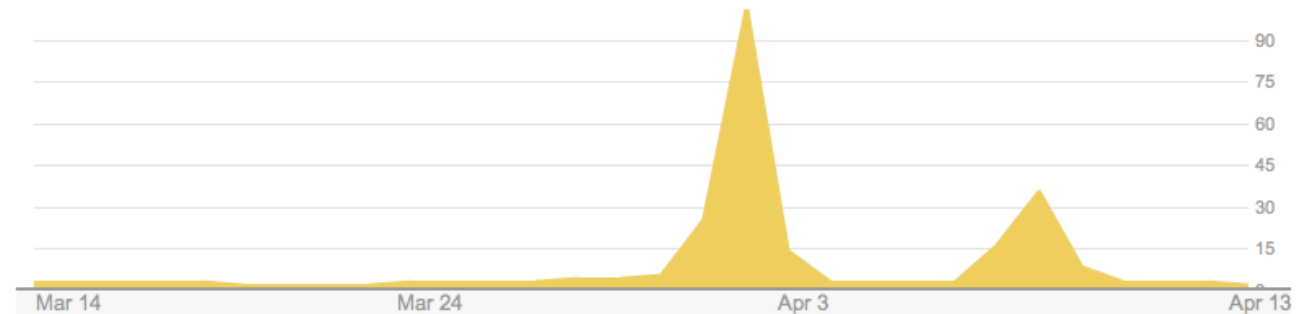
dolly parton

► Past 7 Days

angelina jolie

SEARCHES OVER TIME

[Describe these numbers](#)



BY DEMOGRAPHIC

[Age](#) | [Gender](#) | [Both](#)

Women Age Men

4% Below 24 4%

7% 25 to 34 7%

9% 35 to 44 12%

9% 45 to 54 16%

** Anonymous, based on census data*

Yahoo! Clues

SEARCH FLOW

Previous Queries

angelina jolie movies
angel
craigslist los angeles
jolie
angelina

angelina jolie

Next

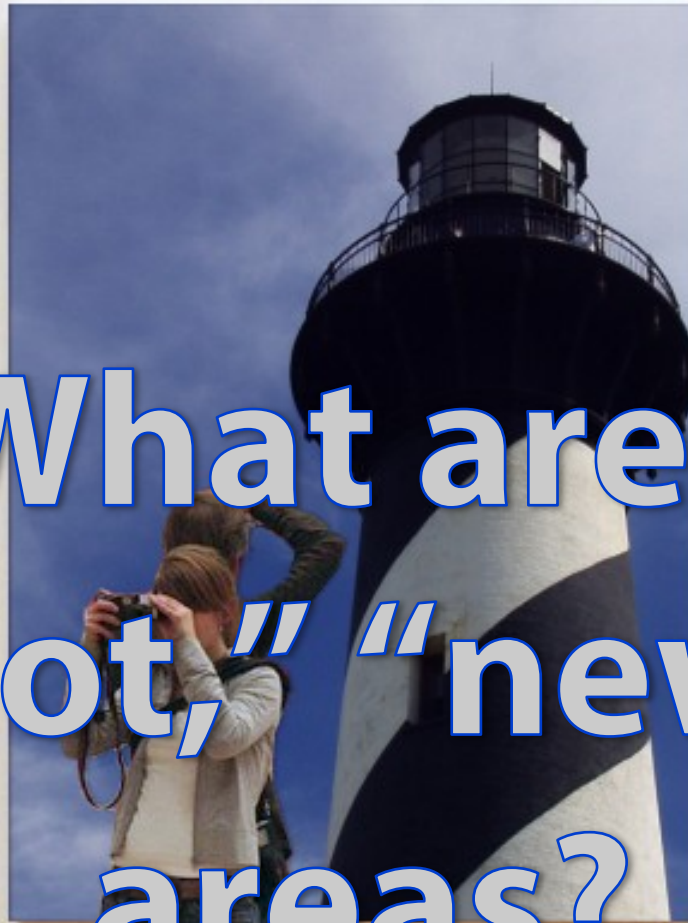
Queries

angelina jolie twins
brad pitt angelina jolie
angelina jolie movies
angelina jolie hot
angelina jolie news

RELATED SEARCHES

brad pitt, james haven, faye dunaway, ethan hawke, jennifer aniston, megan fox, jennifer lopez, lindsay lohan, britney spears, anne hathaway

III. What are the
“hot,” “new”
areas?



Key areas

- Mobile+muliscreen
 - Multimedia
 - Social (?)
-

Mobile (it's all mobile)



Yahoo! Axis (axis.yahoo.com)

The screenshot displays the Yahoo! Axis homepage with the following sections:

- TRENDING SEARCHES:**
 1. roger goodell
 2. jennifer carpenter
 3. sonja morgan
 4. ostrich pillow
 5. nfl referees
 6. jordan pruit
 7. dwts all stars 2012
- ROGER GOODELL (LATEST NEWS):**
 - Roger Goodell needs to immediately clean up ...**
Sometime Tuesday afternoon, after an emergency session of some NFL owners subcommittee ...
 - Roger Goodell joins referee negotiations, ...**
Sports Illustrated - 9 hours ago
 - Goodell involved in officials' contract ...**
The SportsXchange via Yahoo! Sports - 11 hours ago
- Search Results:**
 - Wikipedia:** Roger Goodell - Wikipedia, the free encyclopedia. en.wikipedia.org/wiki/Roger_Goodell
 - Mahalo:** Roger Goodell - Mahalo.com. www.mahalo.com/roger-goodell/



Multimedia (conversations around media)



Social

(to be seen)



Business Applications [Bonchi et al. ACM TIST '11]

APQC's Process Classification Framework (PCF) – Operating Processes

<i>Process Category</i>	<i>Process group or Activity</i>	<i>Technical area</i>
1. Vision & strategy	Social Networking	SN Support tools
2. Products & services	Product Recommendations	Recommenders
	Social product search	Social search
3. Market & selling	Social CRM	SN support tools
	Trend spotting	SN monitoring
	Product quality	SN monitoring
	Social marketing	SN support tools
	Loyalty programs	Influence
	Direct marketing	Influence, communities
	Advertising	Influence
	Business intelligence	Churn, propagation, etc.
	Churn prediction	Influence, propagation
	Reputation monitoring	Monitoring
4. Delivery	Production scheduling	Mining of customer data
5. Customer Service	Customer Support	Expert routing

Business Applications

Management & Support Processes

<i>Process Category</i>	<i>Process group or Activity</i>	<i>Technical area</i>
6. Human Capital	Internal social networking Professional development Recruiting	SN Support tools Expert routing Social search
7. Information Technology	Resource allocation Information sources Content Management	Measurement Data preparation Privacy
8. Financial Resources	Customer & product strategies Customer-product mix Manage internal controls	SN Mining Community Community
9. Property Management	N.A.	N.A.
10. Environmental issues	N.A.	N.A.
11. External Relationships	Public relations program Legal and ethical issues Social networking	Monitoring Privacy SN support tools
12. Knowledge Management	Knowledge sharing Strategic KM	Internal social networks SN Mining

IV. Big Data

New Data Paradigm

- Fragmentation
 - Aggregation
 - Multi-authorship
-

IT'S all ABOUT THE

**CONNECTIONS,
CONNECTIONS,
CONNECTIONS!**

On Implicit Links

“unapparent connections are stronger than ones which are obvious”

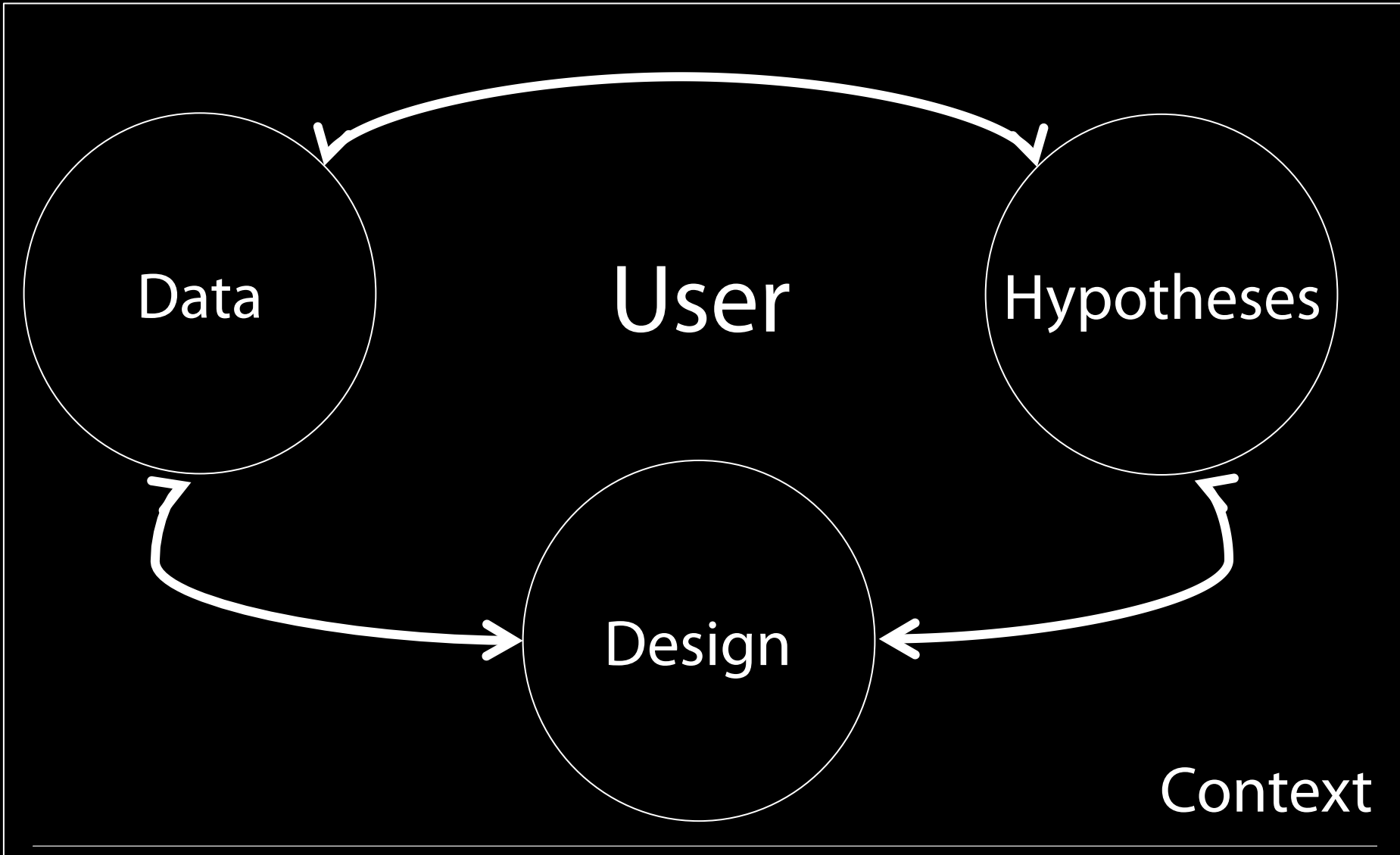
Heraclites

Fifth century BC

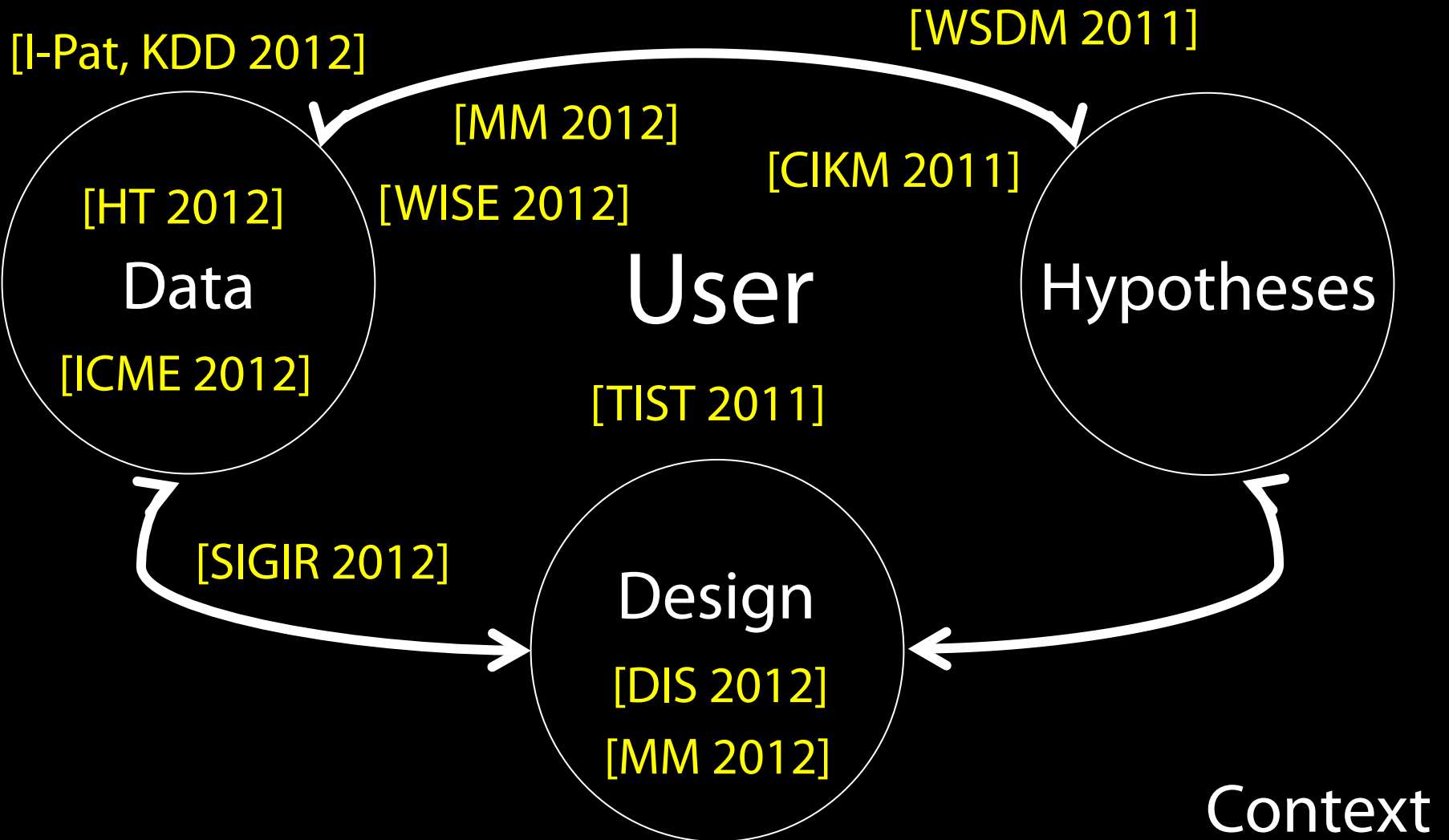
Main Points

1. Not single query, session; context
 2. How can search analysis be useful
 3. “Hot,” “new” areas
 4. Big Data
-

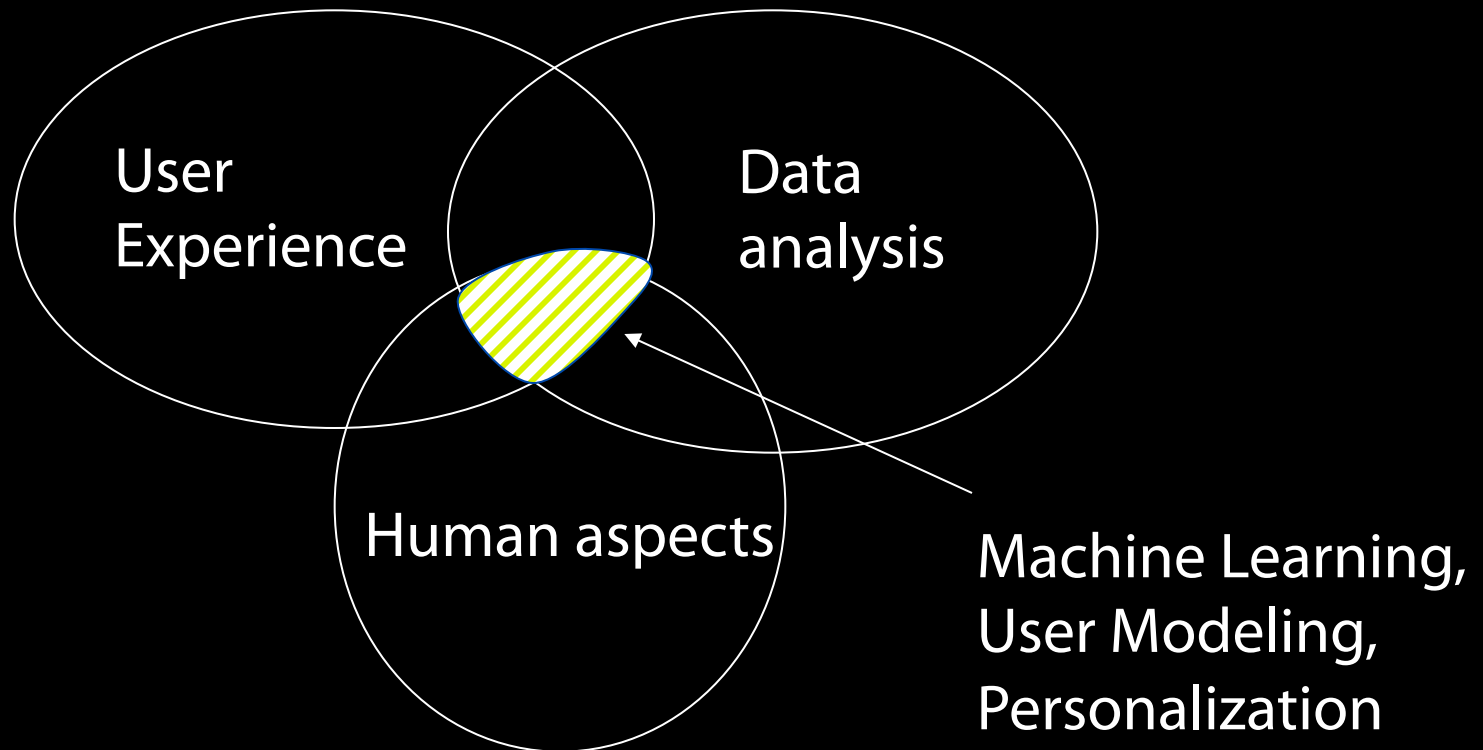
Human-Centered Computing



Human-Centered Computing



Human-Centered Computing





THANK YOU!

Alex Jaimes

Social Media Engagement Group

Neil O'Hare, Luca Aiello, Amin Mantrach, Pancho Tolchinsky, Jordi Vallmitjana, Ricard Sierra, Jordi Atserias, Luca Chiardini, Eduardo Graells, Michele Trevisol, Ruth Garcia.

Collaborators

Ingmar Weber, Barbara Poblete, Marcelo Mendoza

Papers listed at: <http://www.jaimes-larrarte.com>
