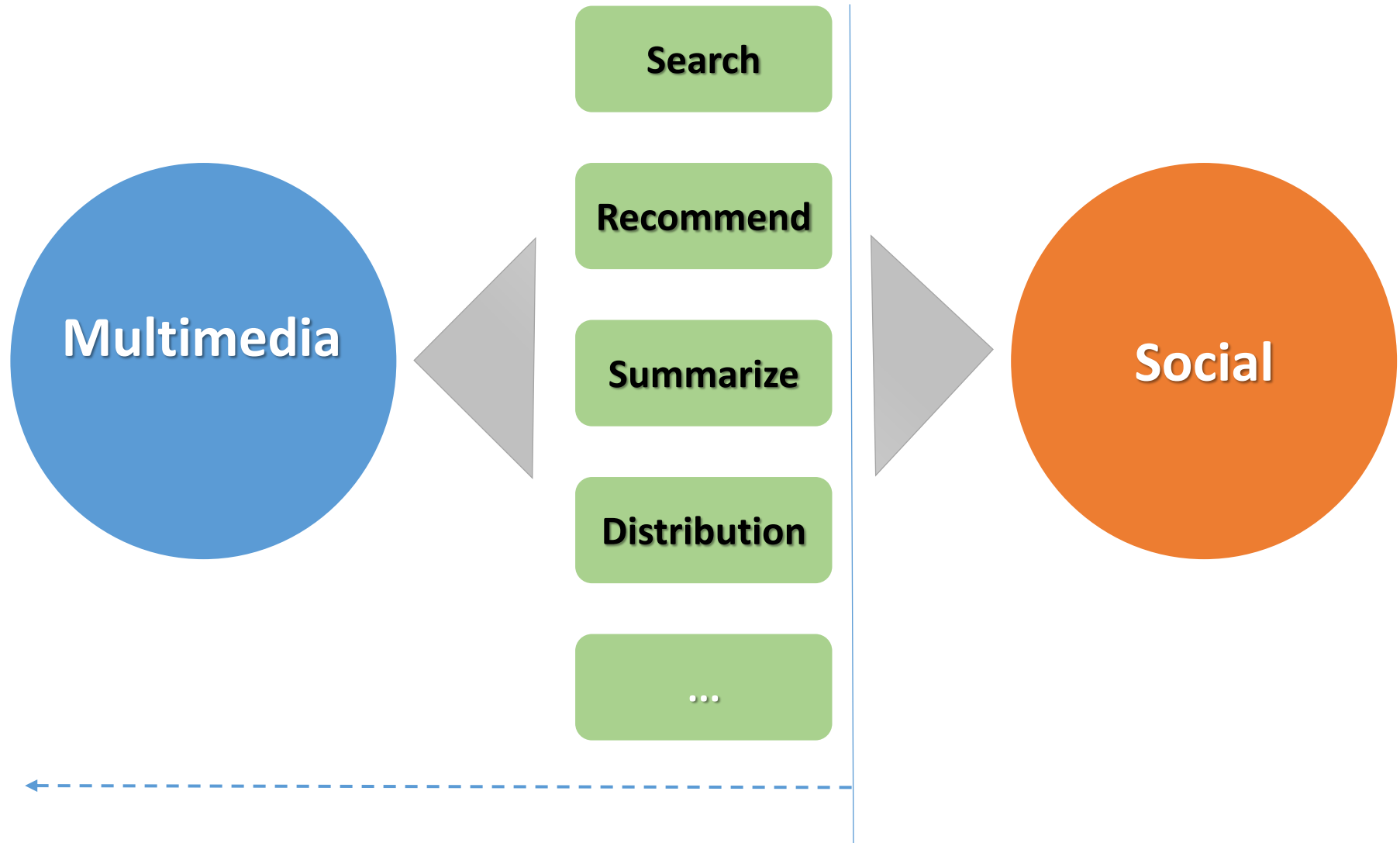


Social-Sensed Multimedia Computing

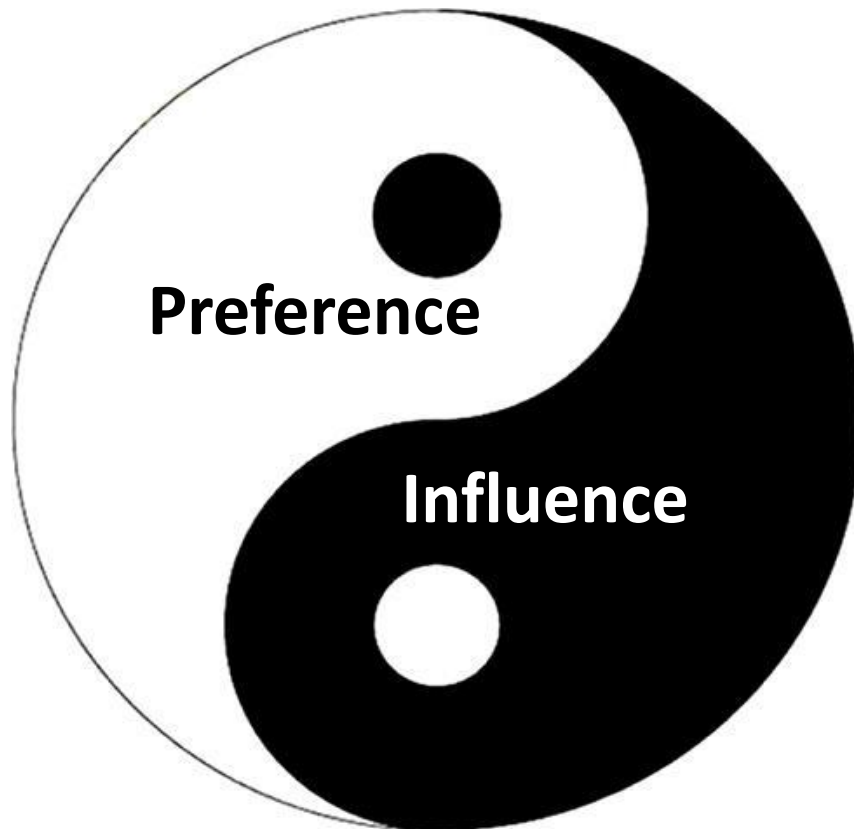
Wenwu Zhu

Tsinghua University

Multimedia Computing

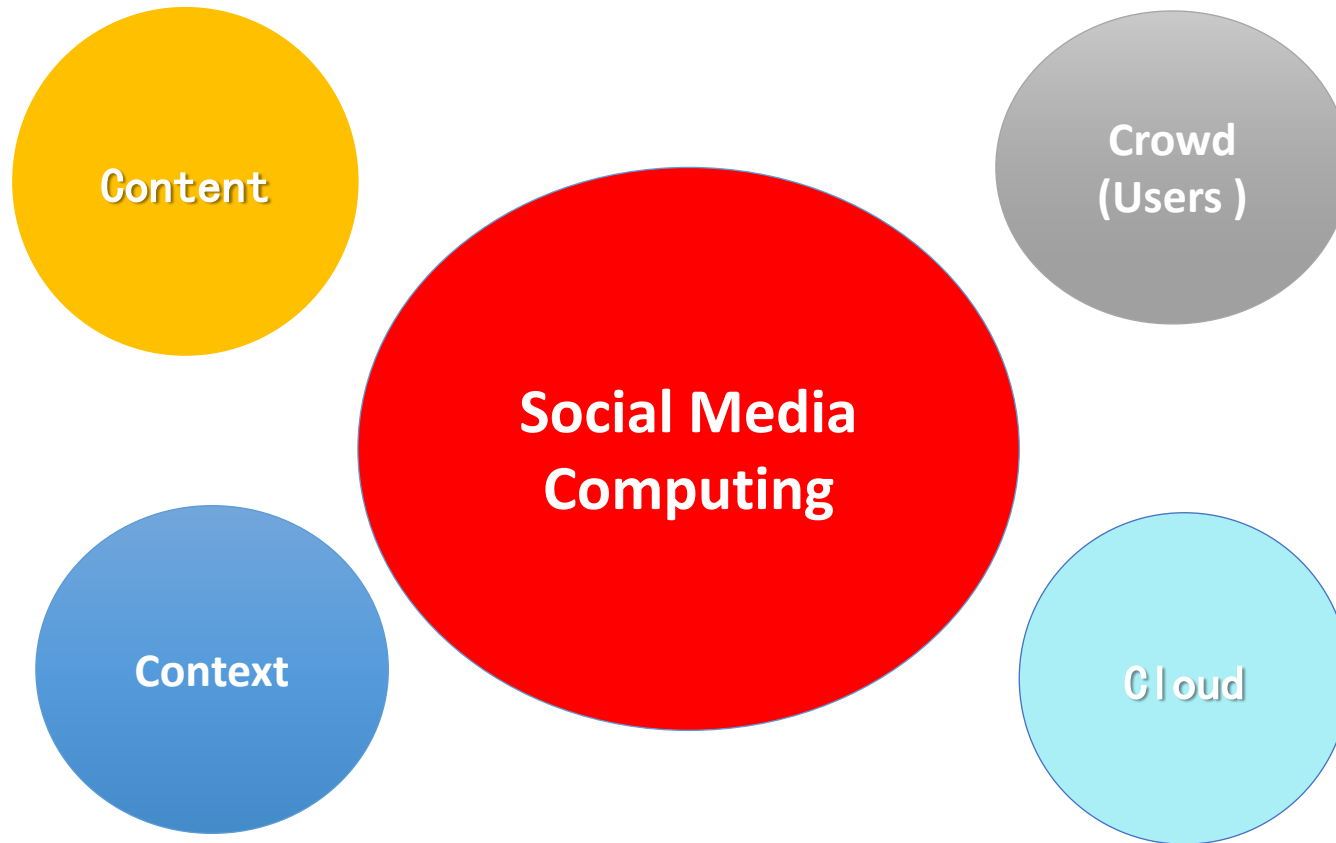


Sense from Social



User behaviors
User preference
User influence
Use relations

Social Media Computing



Social-sensed Multimedia Computing

Social-sensed Image Search

MMM'13 Best Paper Award

Social-sensed Recommendation

SIGIR'11, TMM'13

Social-sensed Media Summarization

MM'12 Grand Challenge Award

Social-sensed Media Distribution

ACM MM '12 Best Paper Award

Social-sensed Emotion Prediction

ACM MM'13

Social Sensed Image Search

Today's Image Search

50% search sessions fail to provide any satisfactory results, even worse for image search.

The **visual style** cannot be clearly expressed by

**User
Data**

search is often exploratory with **no clear goal**.

Intention Gap between user search intent and query

Social Media

Community

社群 (44)
Portland Flickr Junkies 16,836 張相片, 501 位會員
Flickr for iPhone 1,644 張相片, 921 位會員
Notes from Ur 38 張相片, 10 位會員
2012 年度最佳相片 5,808 張相片, 7,134 位會員
Nevada 16,771 張相片, 677 位會員



User Profile



Behaviors



Tweet

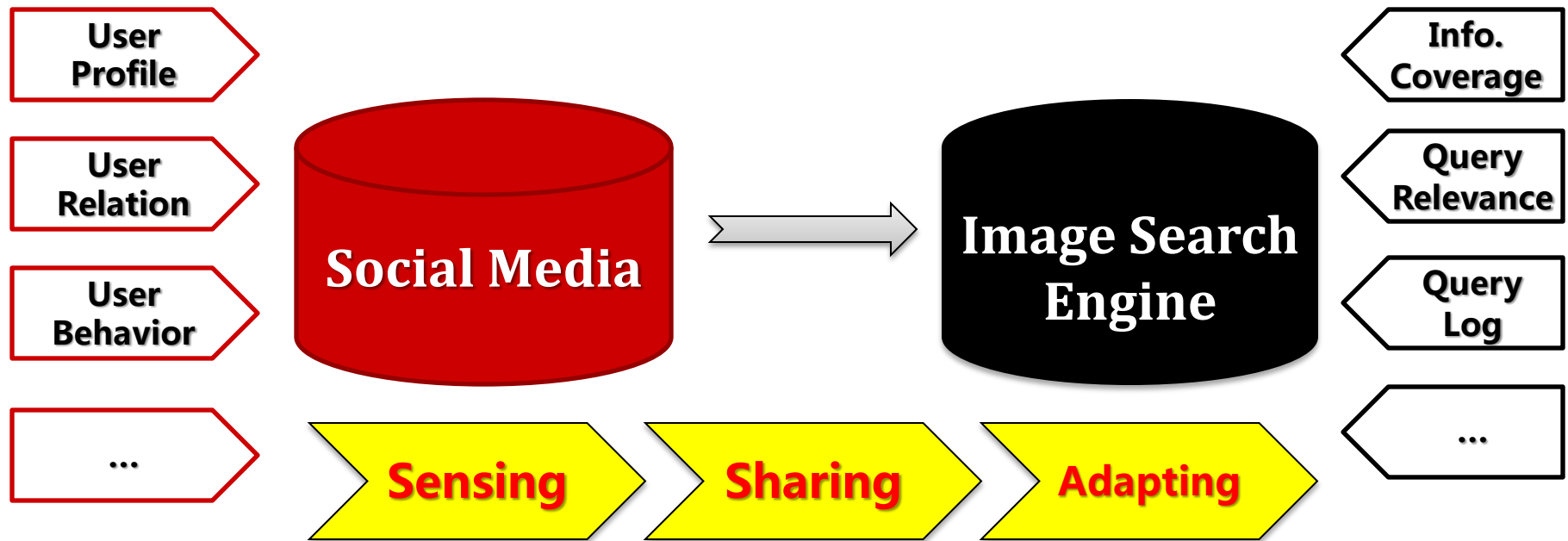


Retweet



Combining knowledge from Social Media will significantly reduce the Intention Gap in image search.

Bridging Image Search and Social Media



Social Relevance

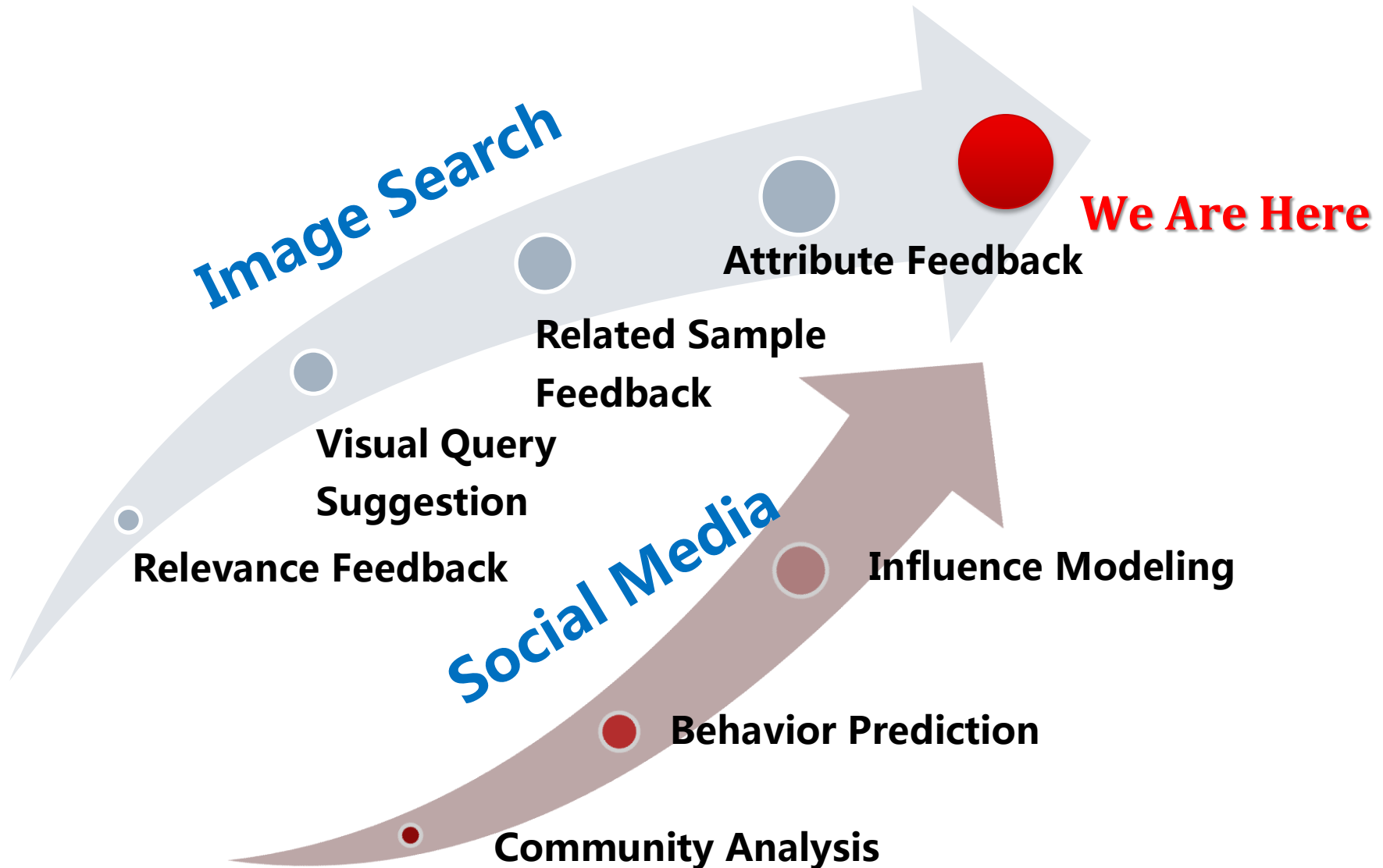
The degree of relevance with user interest

&

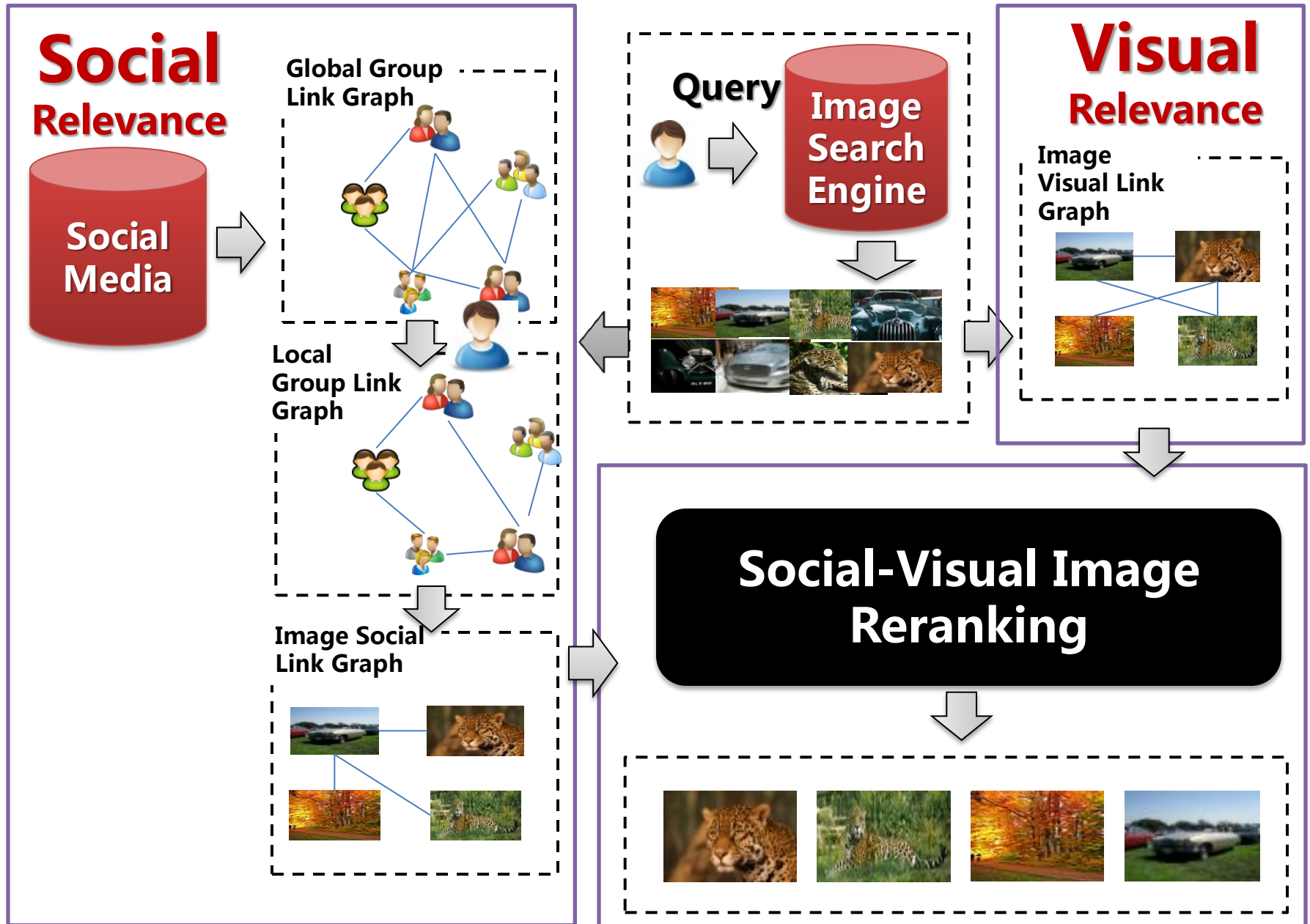
Visual Relevance

The degree of semantic relevance with the query

Related Work



The Framework



Social Sensed Recommendation

Social Media Recommendation

Offline



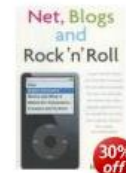
Recommendation

- is a natural process in real life
- drives the diffusion of new ideas, information and tools.

Online

More to Explore

You looked at



[Net, Blogs and Rock 'n' Roll: How...](#) Paperback by David Jennings
~~£14.99~~ **£10.49**

[Find similar items](#)

You might also consider



[Wikinomics: How Mass Collaboration...](#) Hardcover by Don Tapscott, Anthony...
~~£16.99~~ **£8.49**



[Live 1974](#) Audio CD ~ Harmonia
£7.98

amazon

Google

facebook

twitter

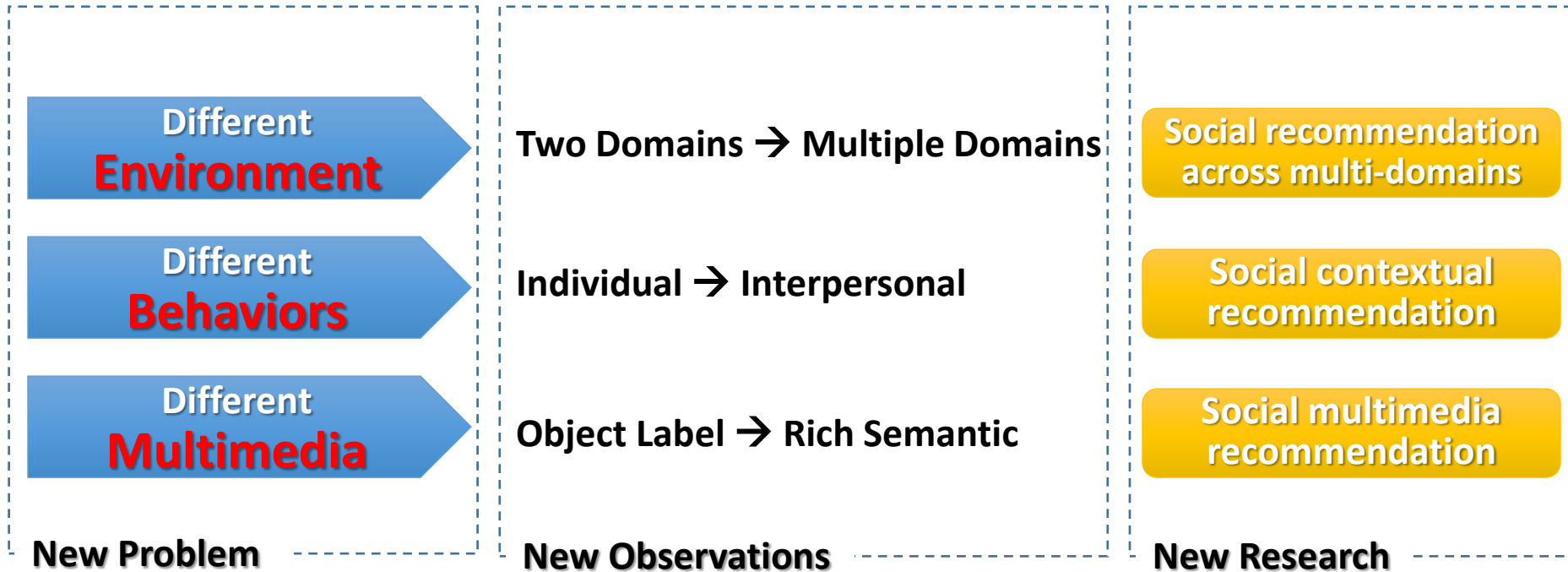
YouTube

flickr

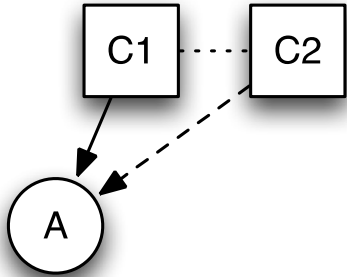
Recommendation

- should simulate the natural process
- should facilitate information seeking and sense making

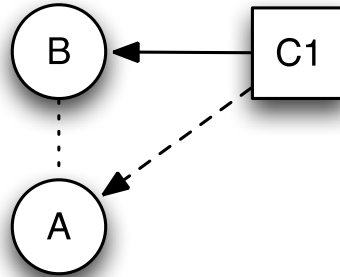
Challenges in Social Media Recommendation



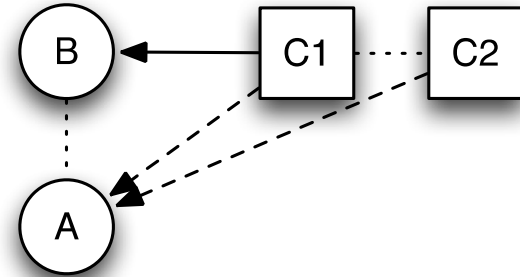
Interest-oriented: Joint Social-content Recommendation



(a) Content based recommendation.



(b) Social based recommendation.



(c) Joint social and content recommendation.

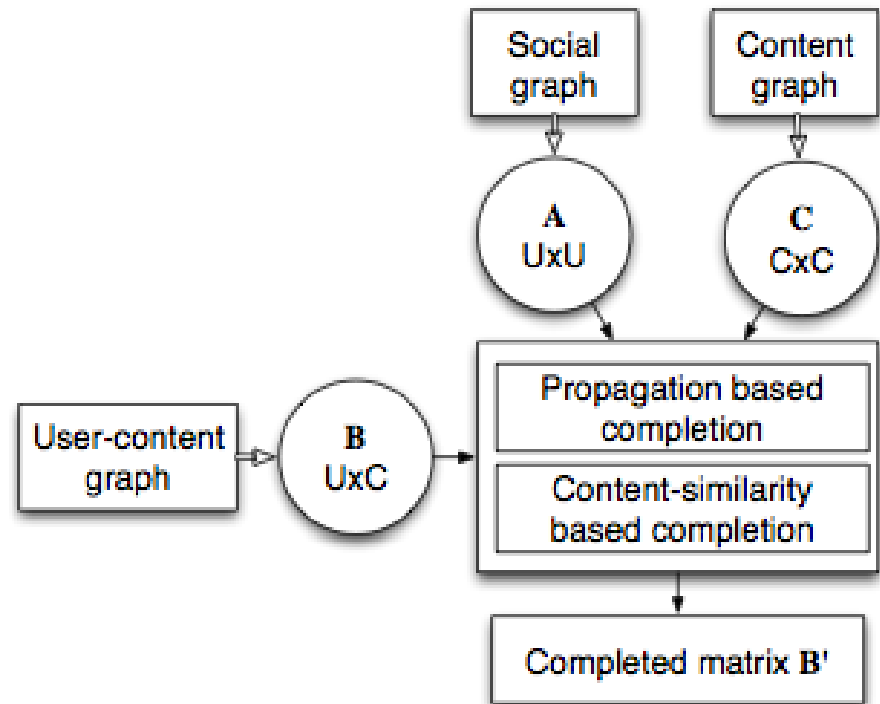
- Joint social and content recommendation
 - Make use of user relationship, content similarity simultaneously

Joint Social-content Recommendation

- Components in JSCR
 - User-content update based on social graph, content graph and user-content graph
 - User-content relative space construction
 - Social action based relative evaluation
 - Recommendation for import
 - Recommendation for re-share

User-content Matrix Updating

- Propagation based updating
 - Inferring users' interests from the propagation patterns
- Content-analysis based updating
 - Inferring users' interests from content similarities



Social Context Recommendation

- **Social context information give us new thinking**
 - Rich context for user to make information adoption decision
 - Context can help us to **understand** and then predict user behaviors
 - Intention of Information adoption: personal issue or **social issue**?
- => Social context recommendation

Information Adoption Mechanism

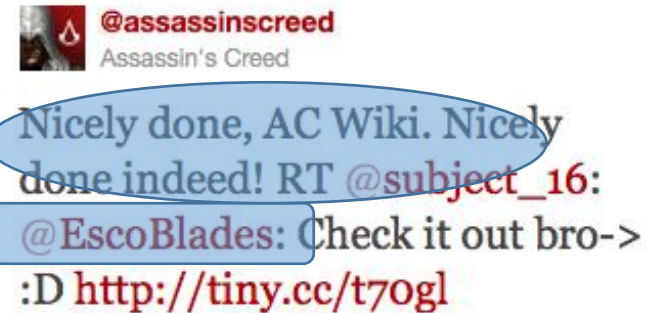
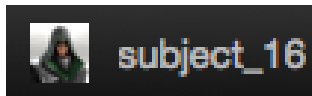
- In Twitter, a user receives a tweet



Interesting!

My friend!

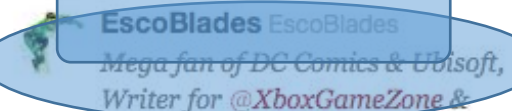
Reply!



Retweeted by Jadis2221 and 9 others



Mentioned in this Tweet



Whether to Adopt the Item

- Read the content and its comments to see whether the item is interesting

User Preference

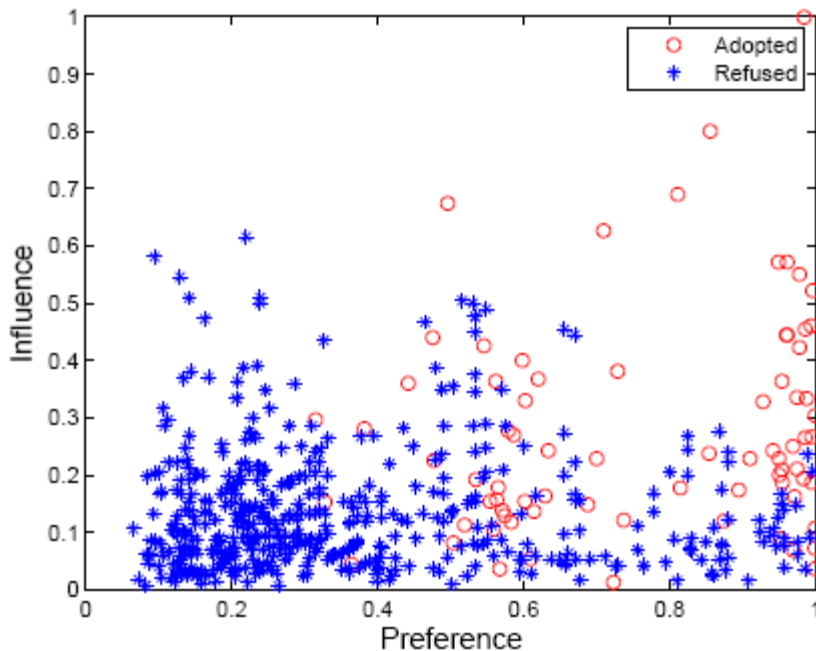
- Care about whom the sender is, whether the sender is a close friend or authoritative

Social Influence

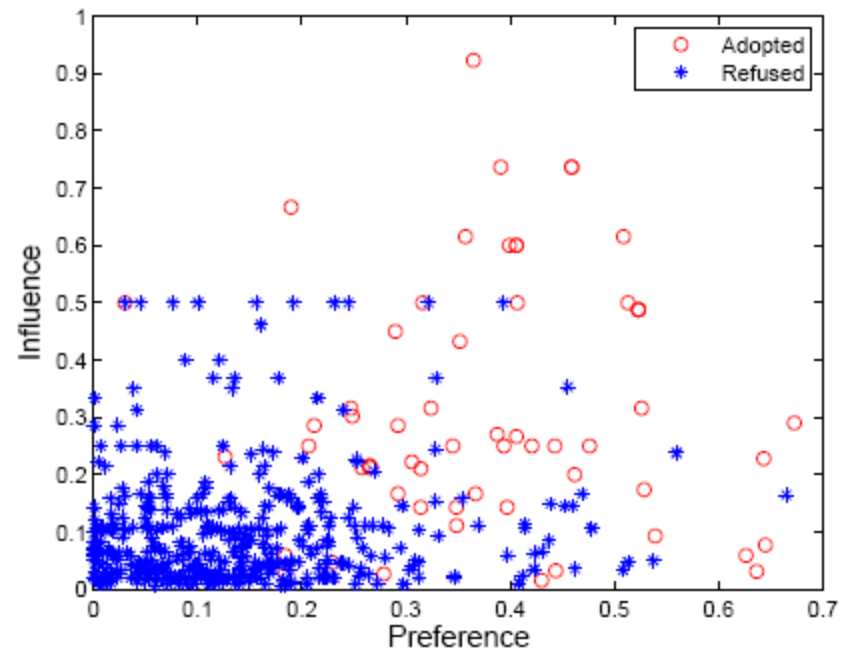
Social Contextual Information

Data-Driven Study

Accepted cases and refused cases have different distributions in the preference-influence space



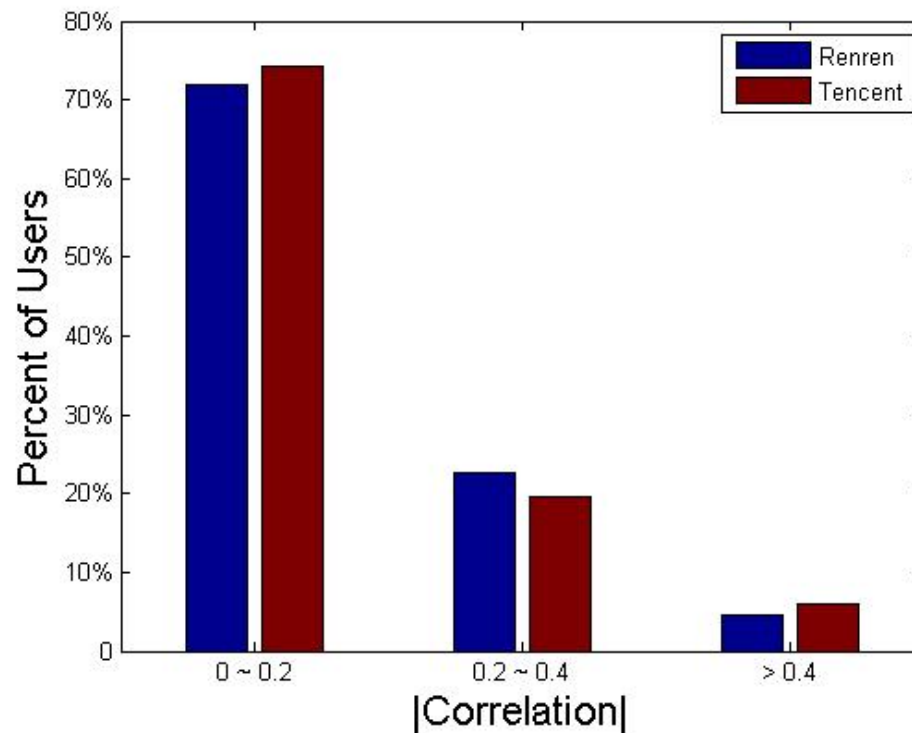
(a) Renren Dataset



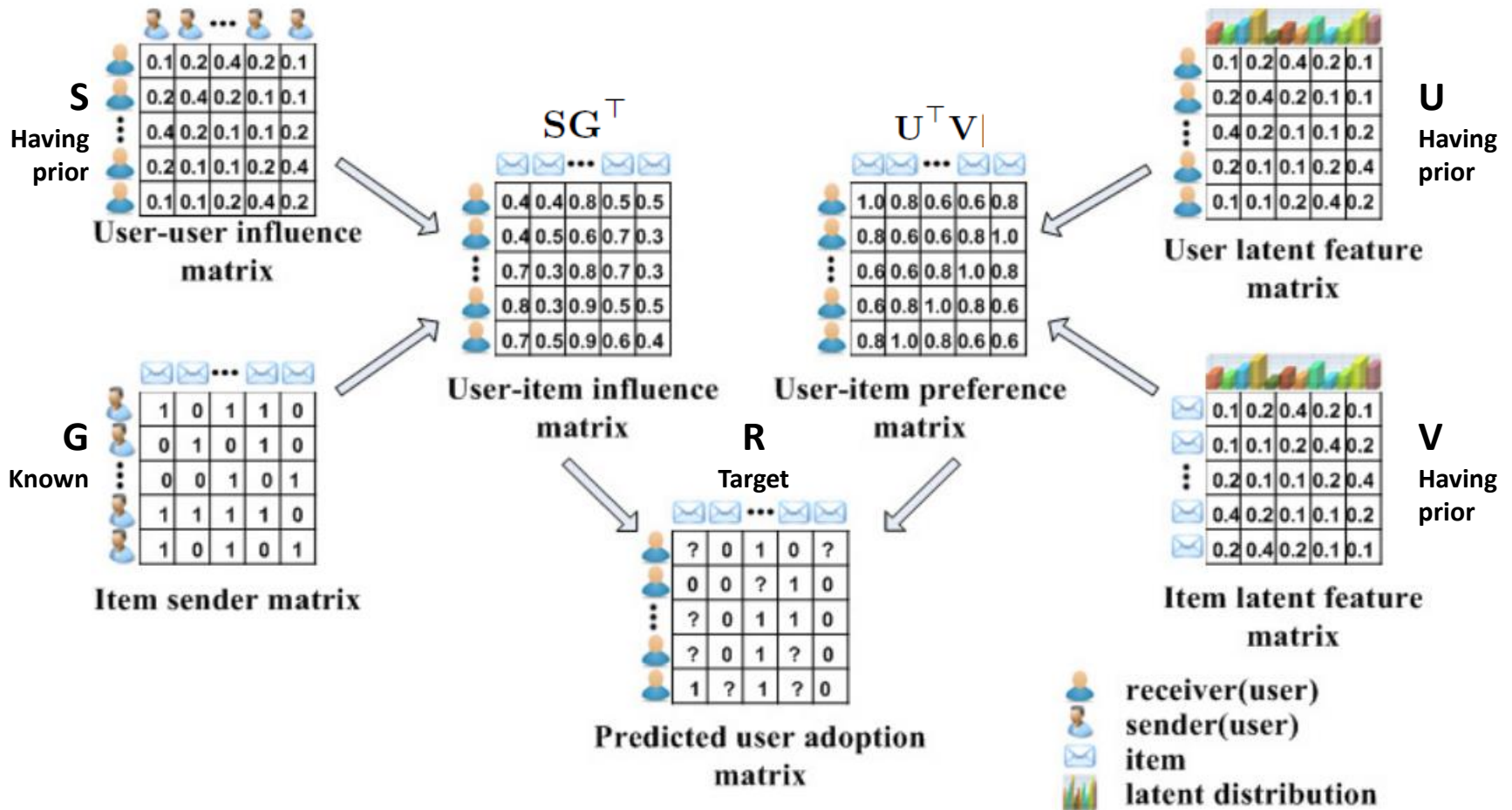
(b) Tencent Weibo Dataset

Data-Driven Study

Preferences and influences are weakly correlated for most users

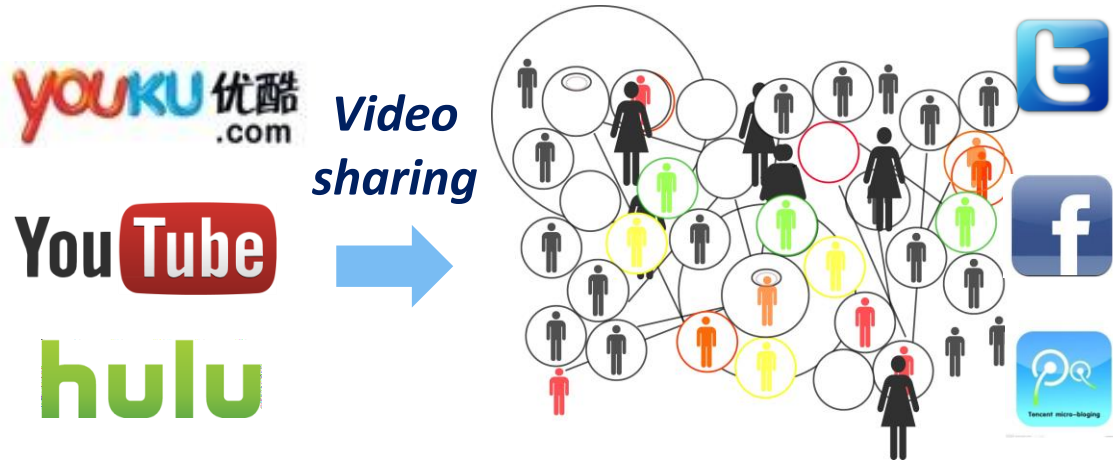


Social Contextual Recommendation



Social Sensed Video Replication

Social Network Changes How People Consume Multimedia

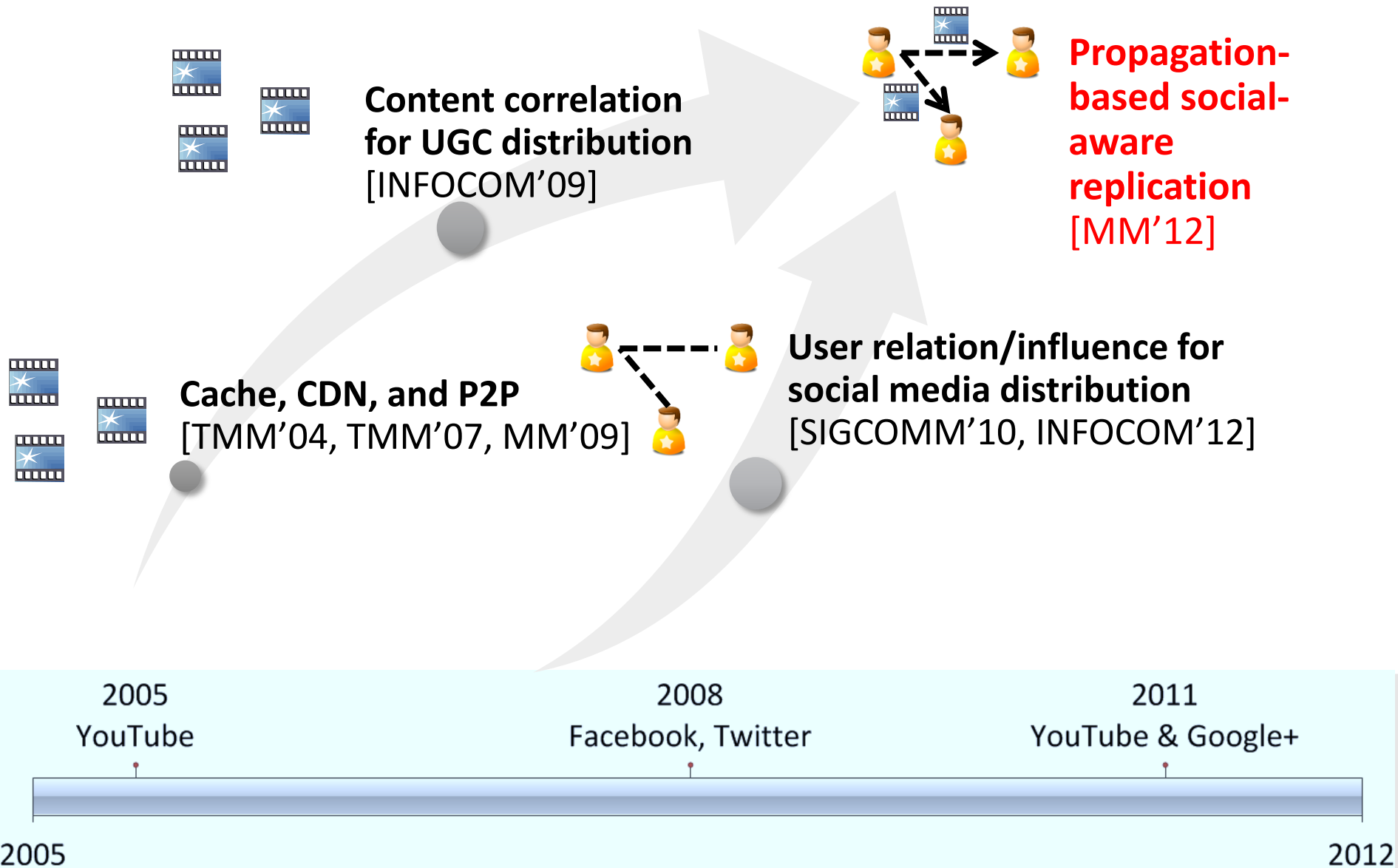


Over **700** YouTube video links are imported to Twitter every minute

Over **500** years of YouTube videos are watched every day on Facebook

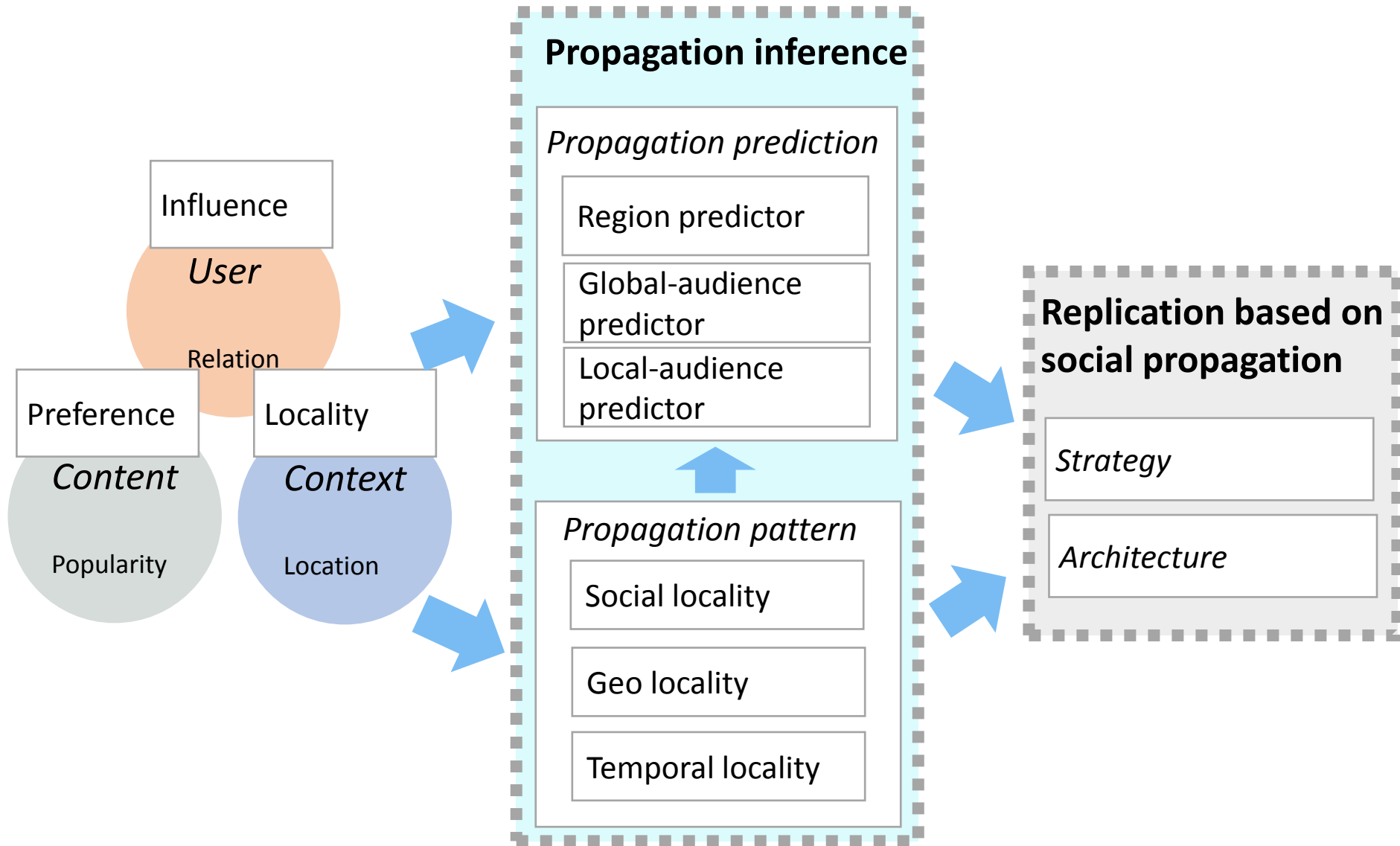
Over **30%** users select videos using social network service in China

Related Works



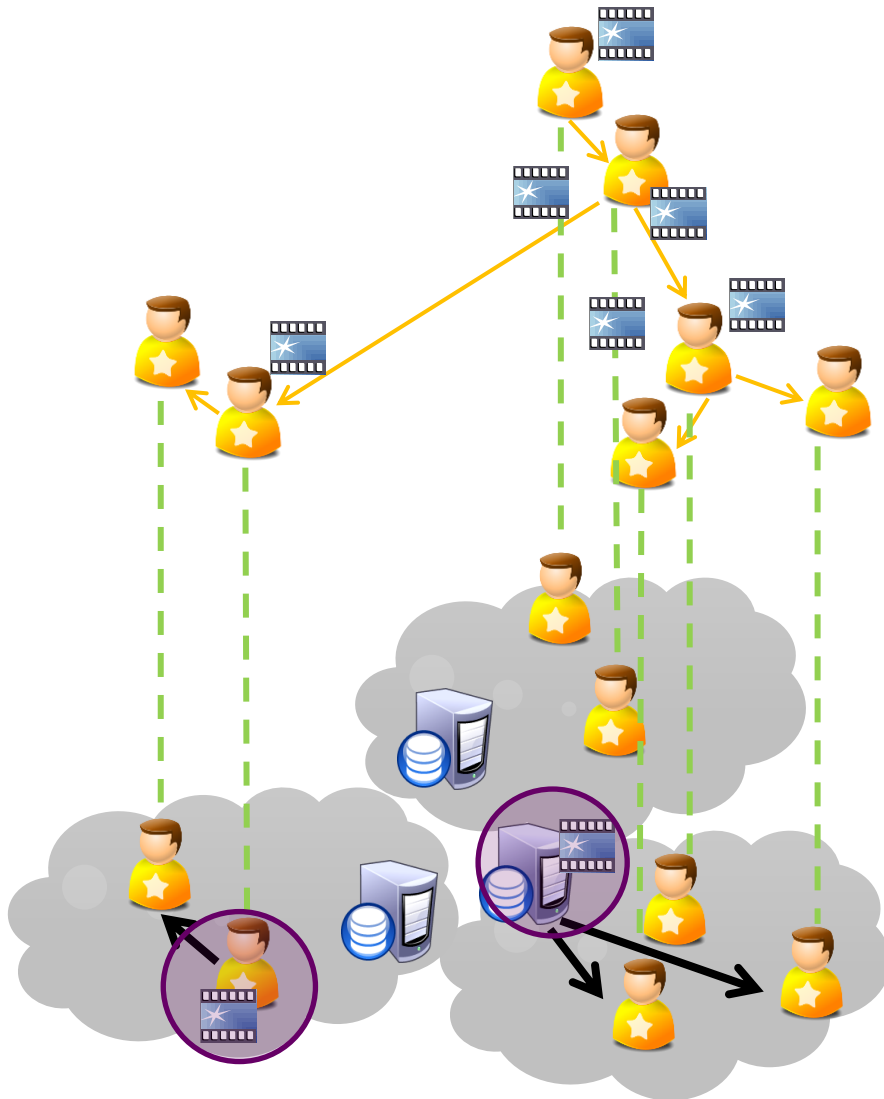
The Framework

Propagation Inference: Jointly consider user, content, and context



Architecture Design of PSAR

Propagation pattern: social, geographical and temporal localities



Content propagation
predication



Propagation-based
social-aware replication



Edge-cloud and peer-
assisted architecture

Thanks!

wwzhu@tsinghua.edu.cn