

MODELING COMPLEX BEHAVIOR IN SOCIAL MEDIA

Meng Jiang (Office 2130, Siebel Center)

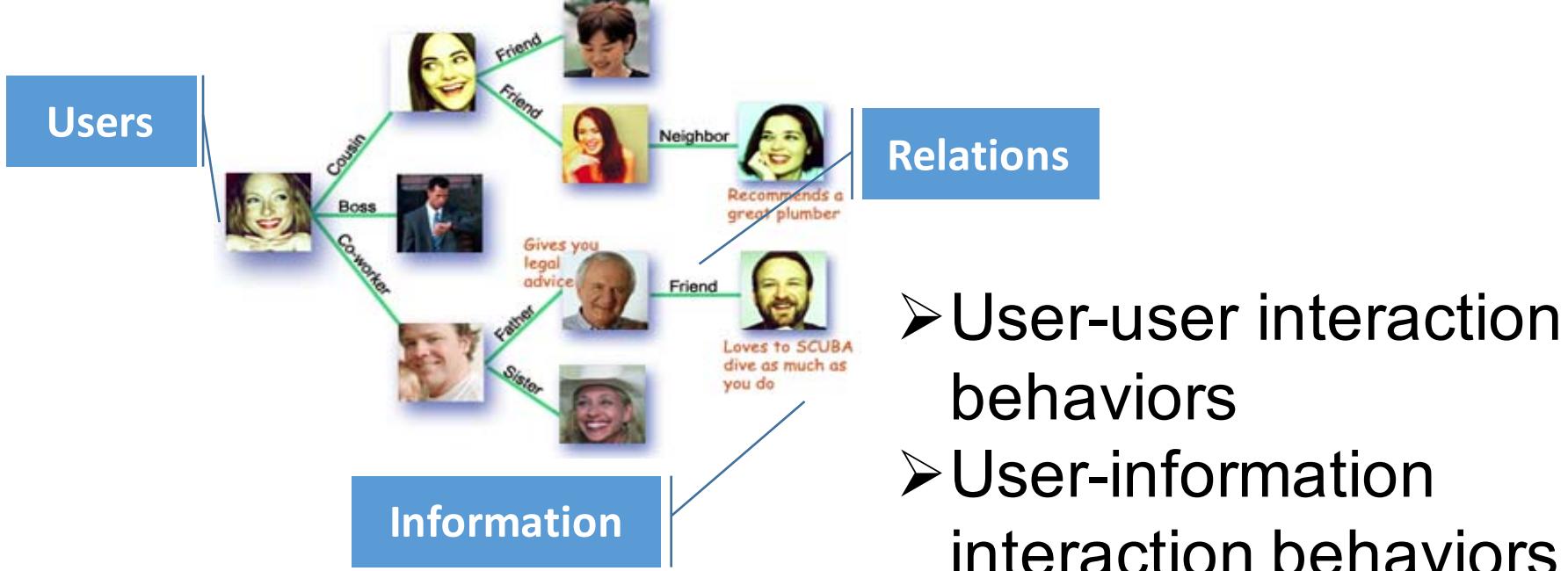
Department of Computer Science

University of Illinois at Urbana-Champaign

www.meng-jiang.com



User Behavior in Social Media



- User-user interaction behaviors
- User-information interaction behaviors

User behavior is a fundamental element in social media

Behavioral Modeling

Understanding

Predicting

Intervening

Applications of Behavioral Modeling

Recommendation

More to Explore

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Wikinomics: How Mass Collaboration... Hardcover by Don Tapscott, Anthony...
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Targeting AD

Anti Spam

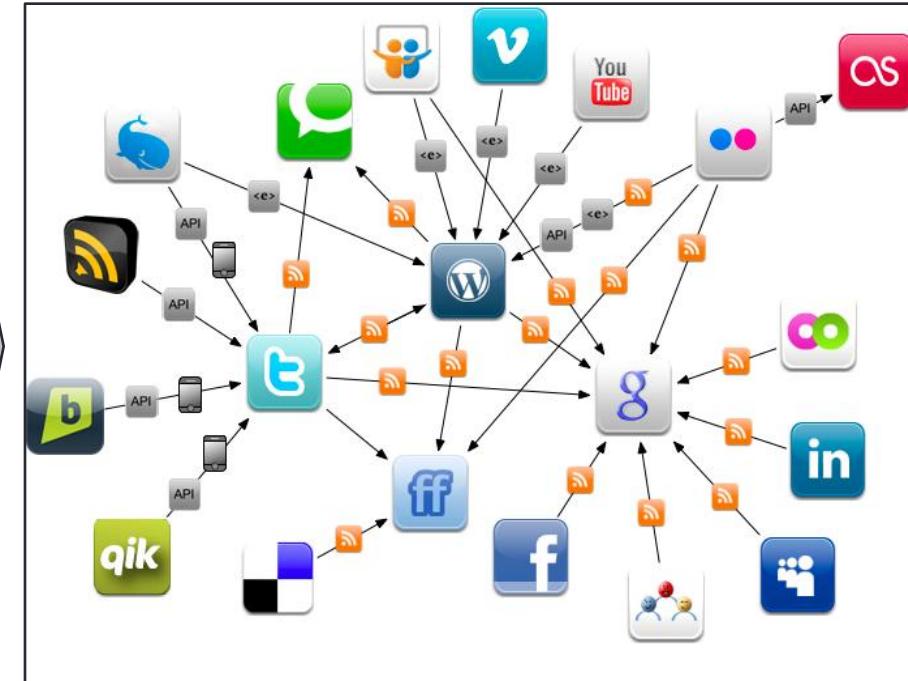
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Scientific Value of Behavioral Modeling

Physical World



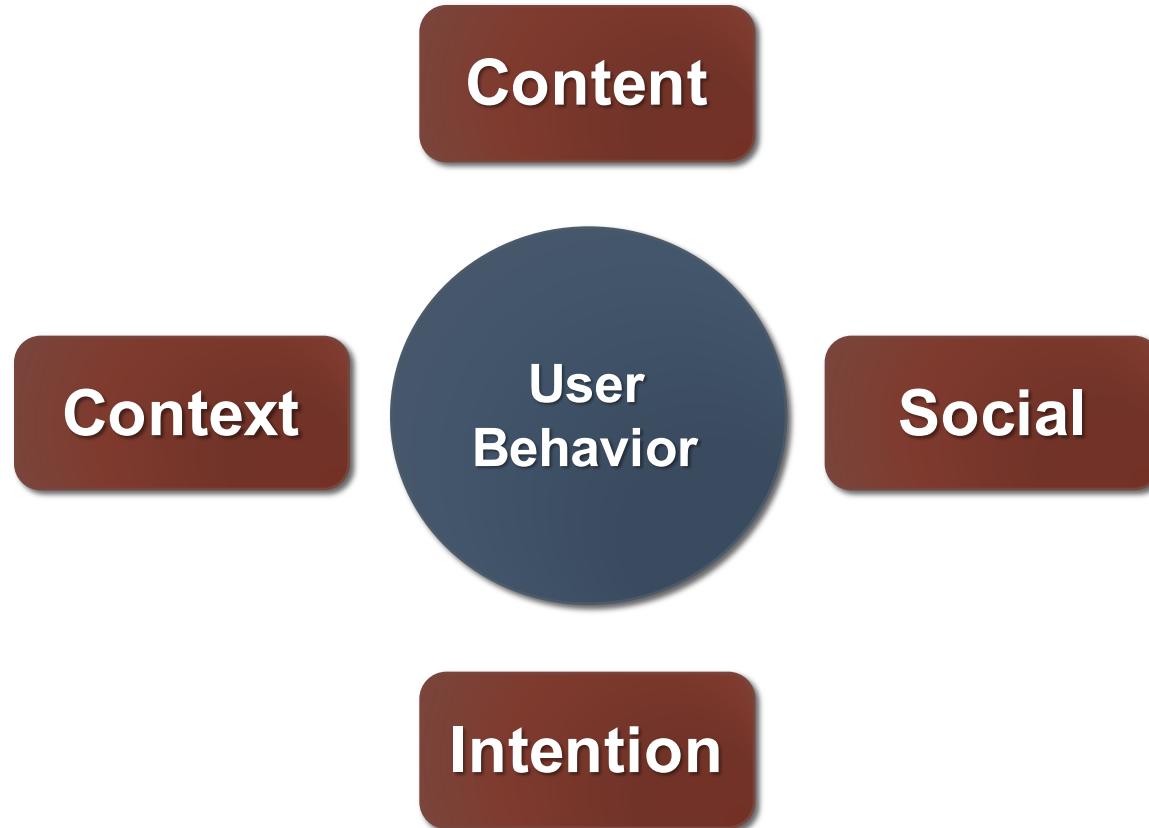
Online Social Networks



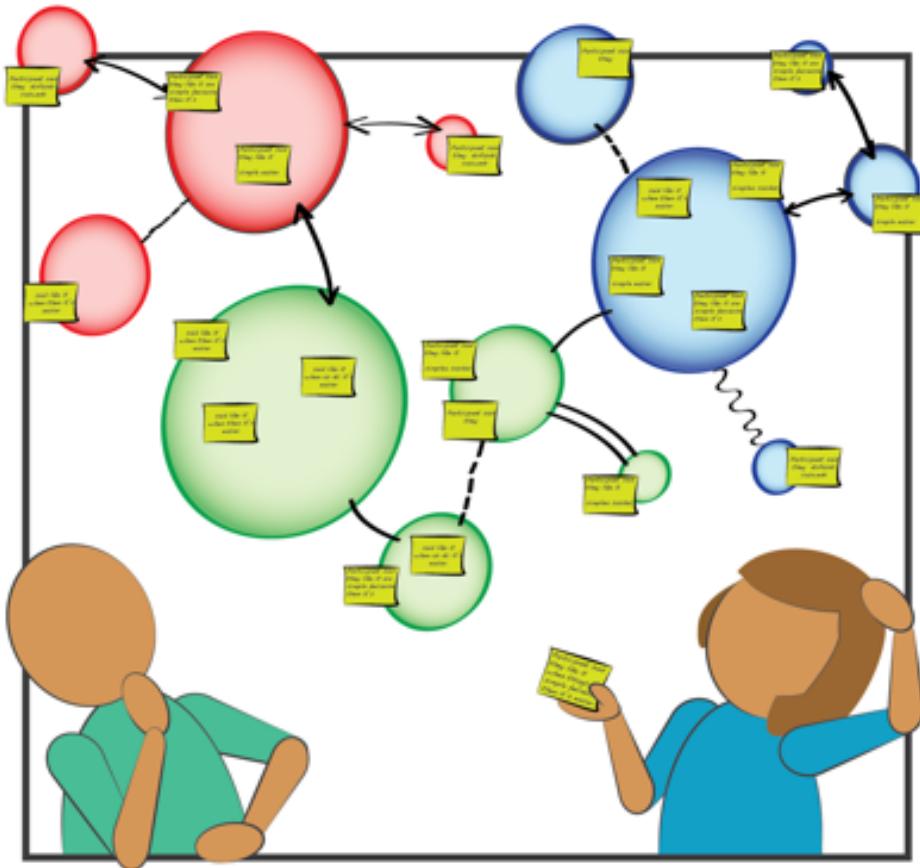
The human behaviors are broadly and deeply recorded in an unprecedented level.

This is the first time that we can get insights of human behaviors and the society from large scale real data.

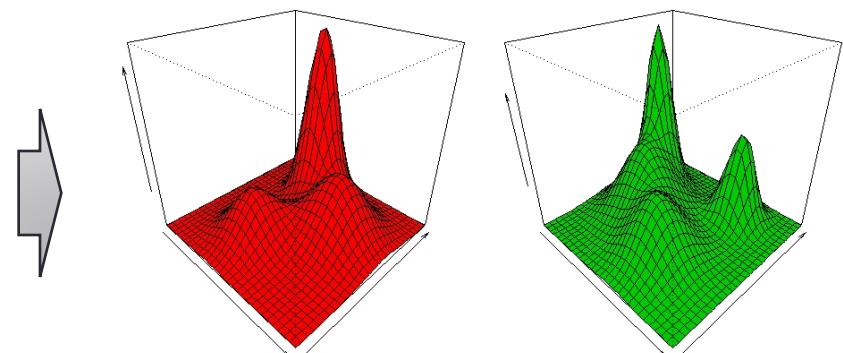
User Behaviors are Complex



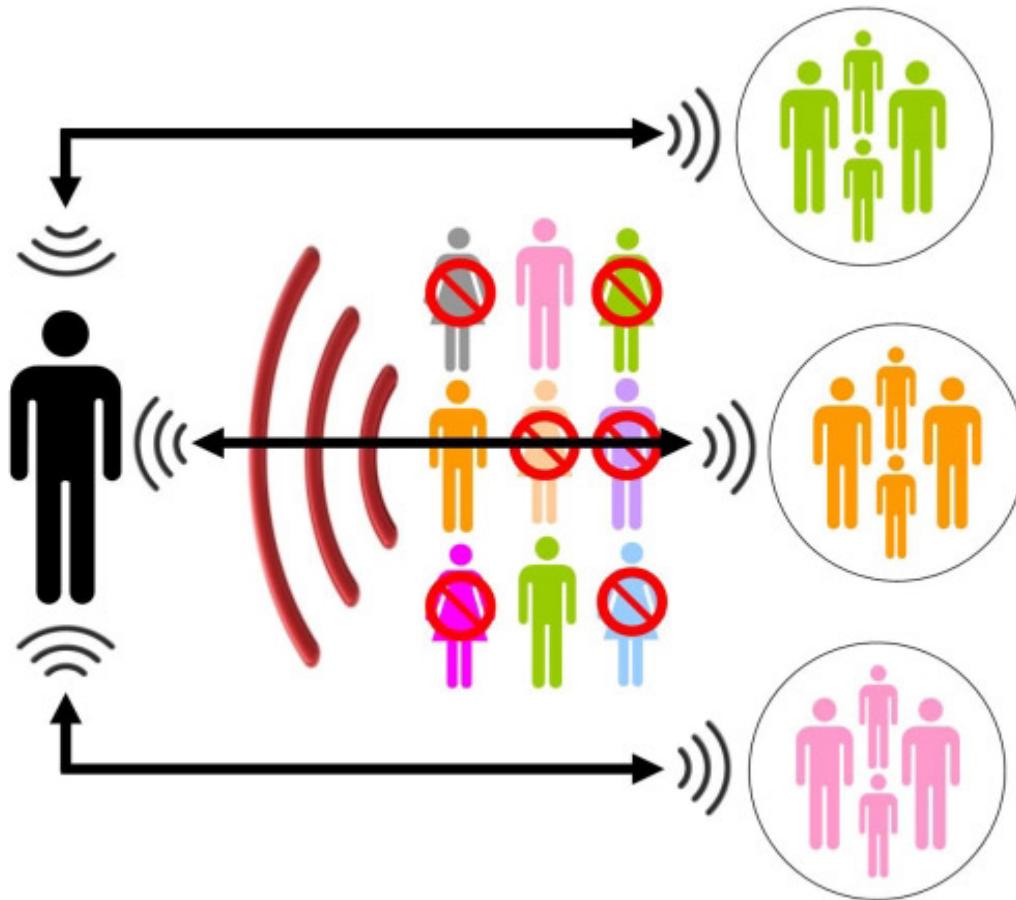
Content Related



User preference is an important driving factor for user behavior modeling.



Social Related



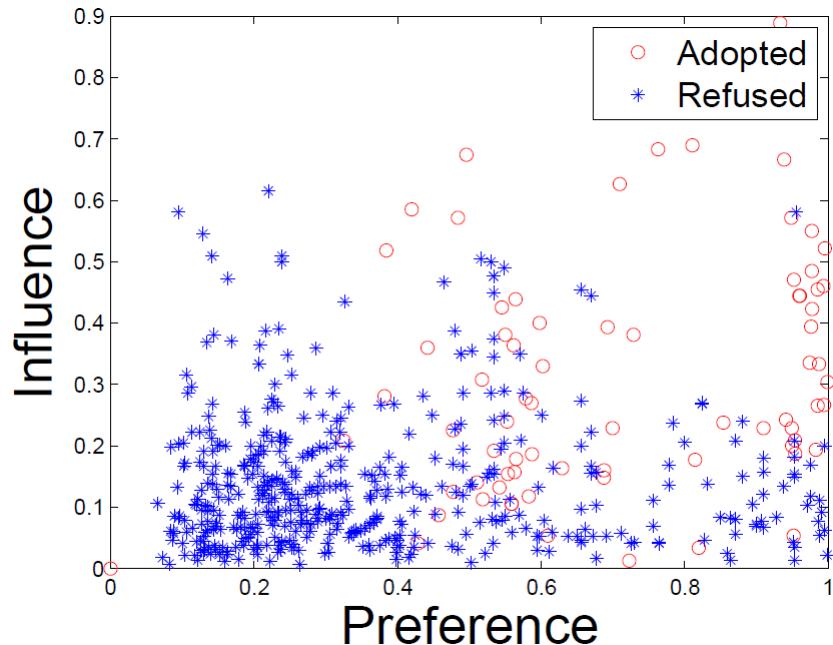
Context Related



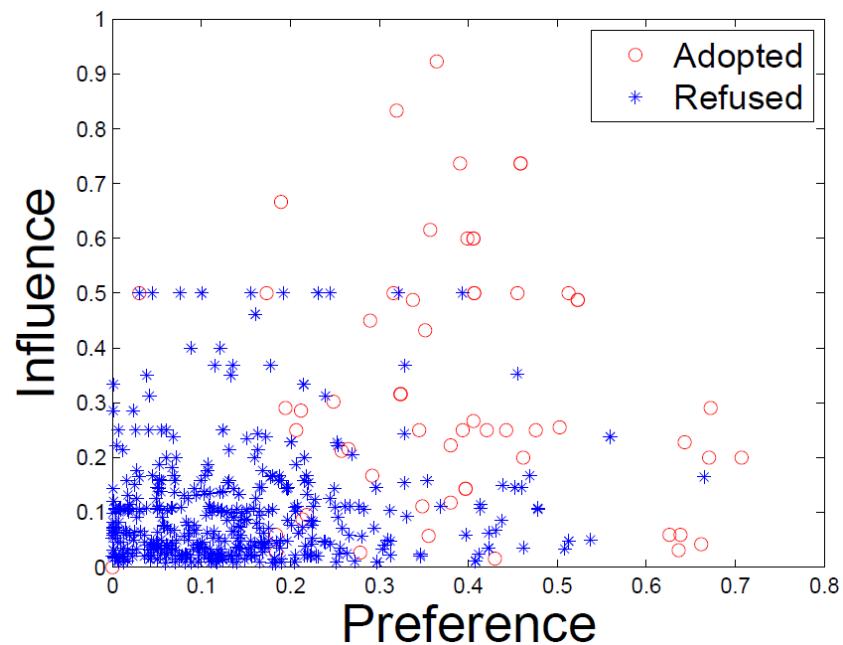
Rich context info in social networks. How to couple them with behavioral modeling?

Social Contextual Factors

❖ Individual Preference & Interpersonal Influence



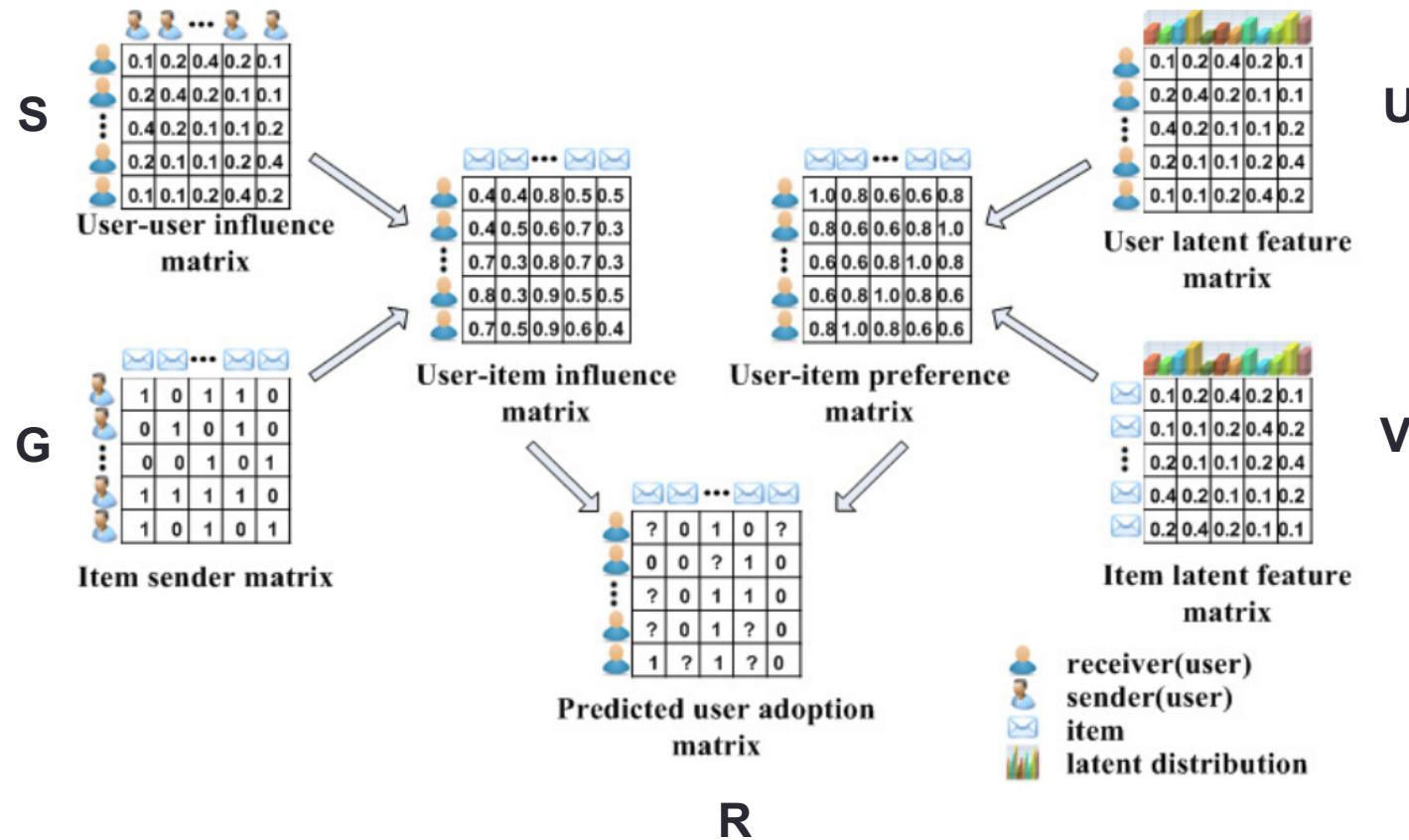
China's Facebook:
Renren



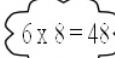
China's Twitter:
Tencent Weibo

Social Contextual Recommendation

❖ ContextMF



Intention Related

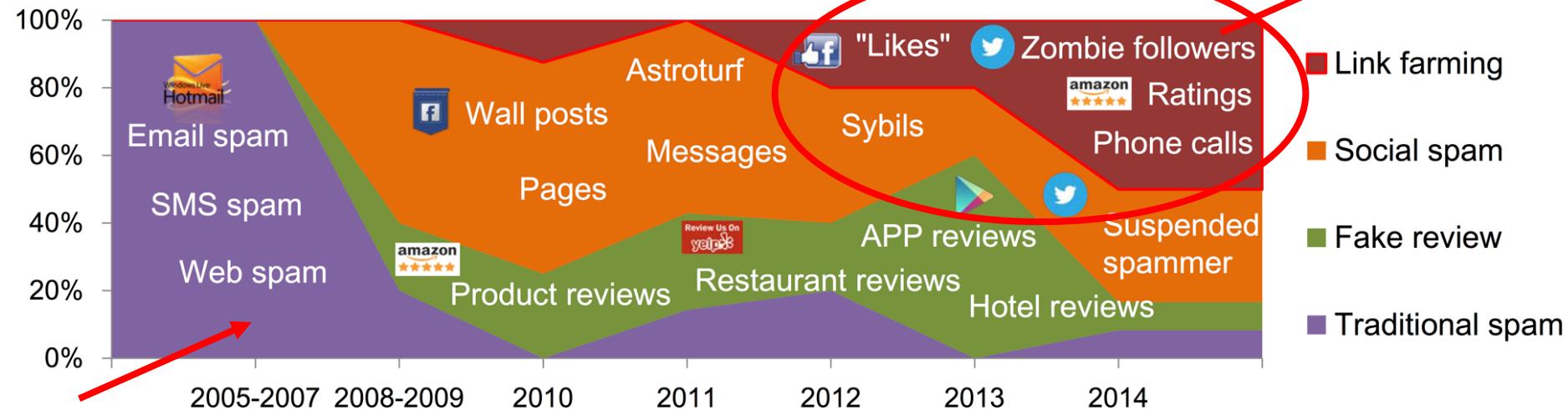
REWARDS	# TICKETS GIVEN	CONSEQUENCES	# TICKETS TAKEN AWAY		
 Extra Math $6 \times 8 = 48$	+5	 YOU ARE A WINNER!	 HITTING	-3	 YOU ARE A WINNER!
 Getting along WELL with others	+3	 YOU ARE A WINNER!	 BULLYING	-4	 YOU ARE A WINNER!
 Good Table Manners	+4	 YOU ARE A WINNER!	 TEASING	-1	 YOU ARE A WINNER!
 LOVE & RESPECT	+5	 YOU ARE A WINNER!	 LYING	-2	 YOU ARE A WINNER!
 Obeying the FIRST TIME	+3	 YOU ARE A WINNER!	 THROWING A FIT	-3	 YOU ARE A WINNER!
 Calm & Quiet in STORE	+3	 YOU ARE A WINNER!	 Ignoring Parents	-4	 YOU ARE A WINNER!
 Extra Reading	+2	 YOU ARE A WINNER!	 SCREAMING or YELLING	-1	 YOU ARE A WINNER!
 CLEANING up after PLAYING	+2	 YOU ARE A WINNER!	 BAD SPORT	-2	 YOU ARE A WINNER!

A nontrivial part of user behaviors are from profitable and social purposes.

Intention can account for the behaviors that cannot be well interpreted by content, social and context.

Suspicious Behavior Detection

Social Link Farming



Suspicious Behavior Detection: Current Trends and Future Directions.
Special Issue on Online Behavioral Analysis and Modeling, IEEE Intelligent Systems Magazine (ISSI), 2016.

Social Link Farming

❖ Selling Twitter followers

<p>5,000 FOLLOWERS \$69.99 Delivery within 3-4 days Buy Now  VISA Save + 3%</p>	<p>2,000 FOLLOWERS \$29.99 Delivery within 2-3 days Buy Now  VISA Save + 2%</p>	<p>1,000 FOLLOWERS \$15.99 Delivery within 1-2 days Buy Now  VISA</p>	<p>10,000 FOLLOWERS \$119.99 Delivery within 4-5 days Buy Now  VISA Save + 14%</p>	<p>20,000 FOLLOWERS \$229.99 Delivery within 5-8 days Buy Now  VISA Save + 34%</p>
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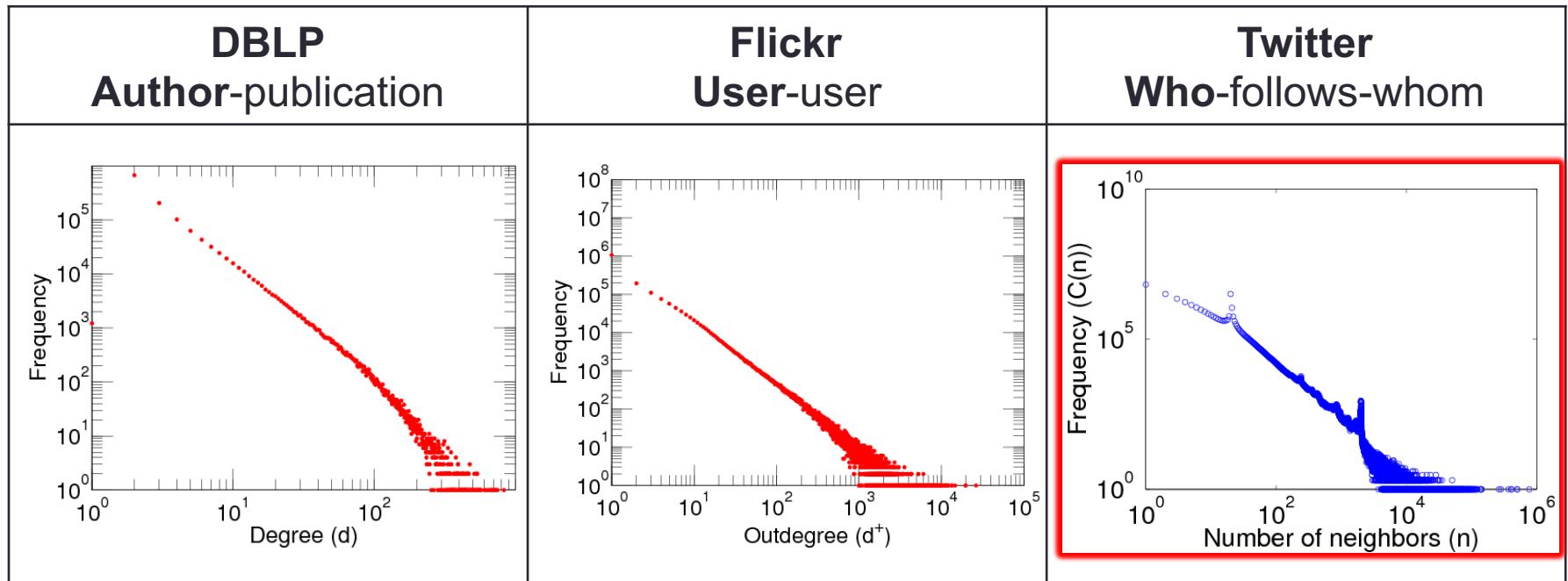
Social Link Farming

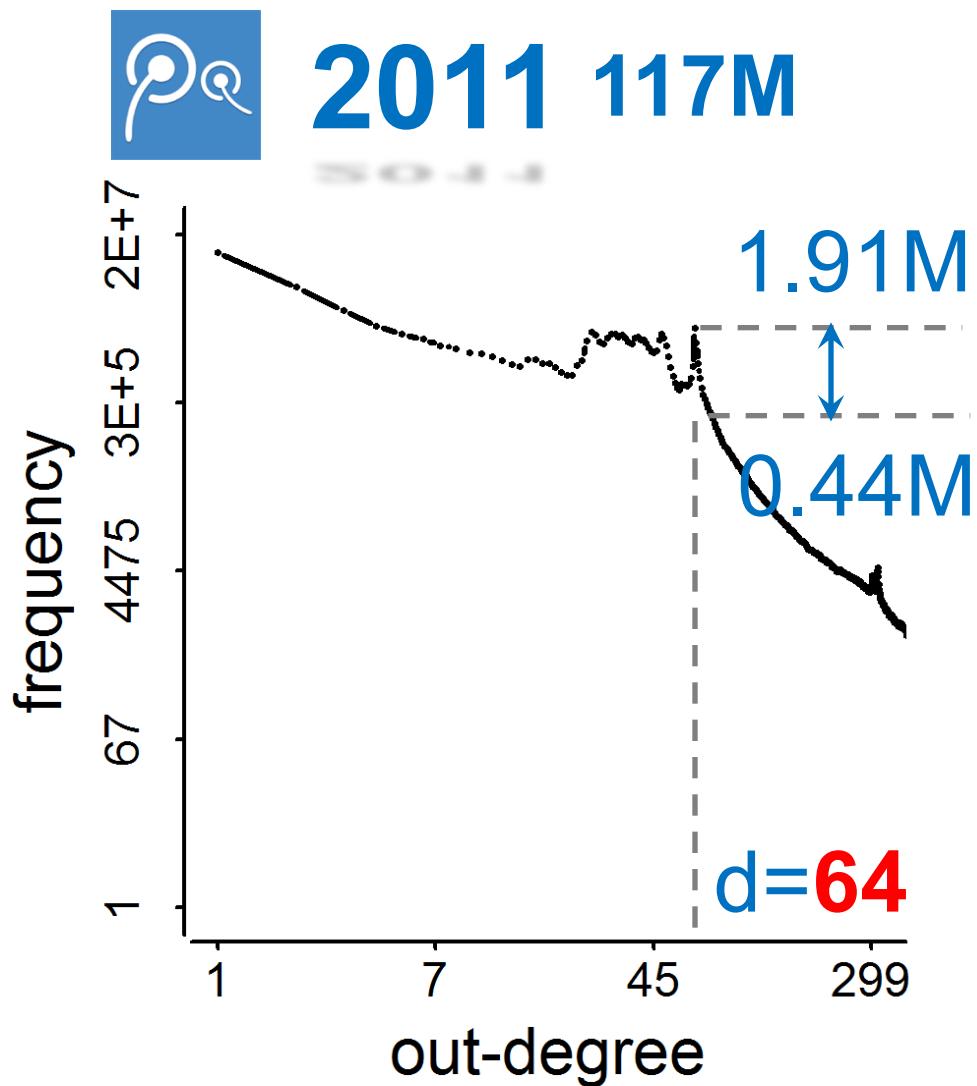
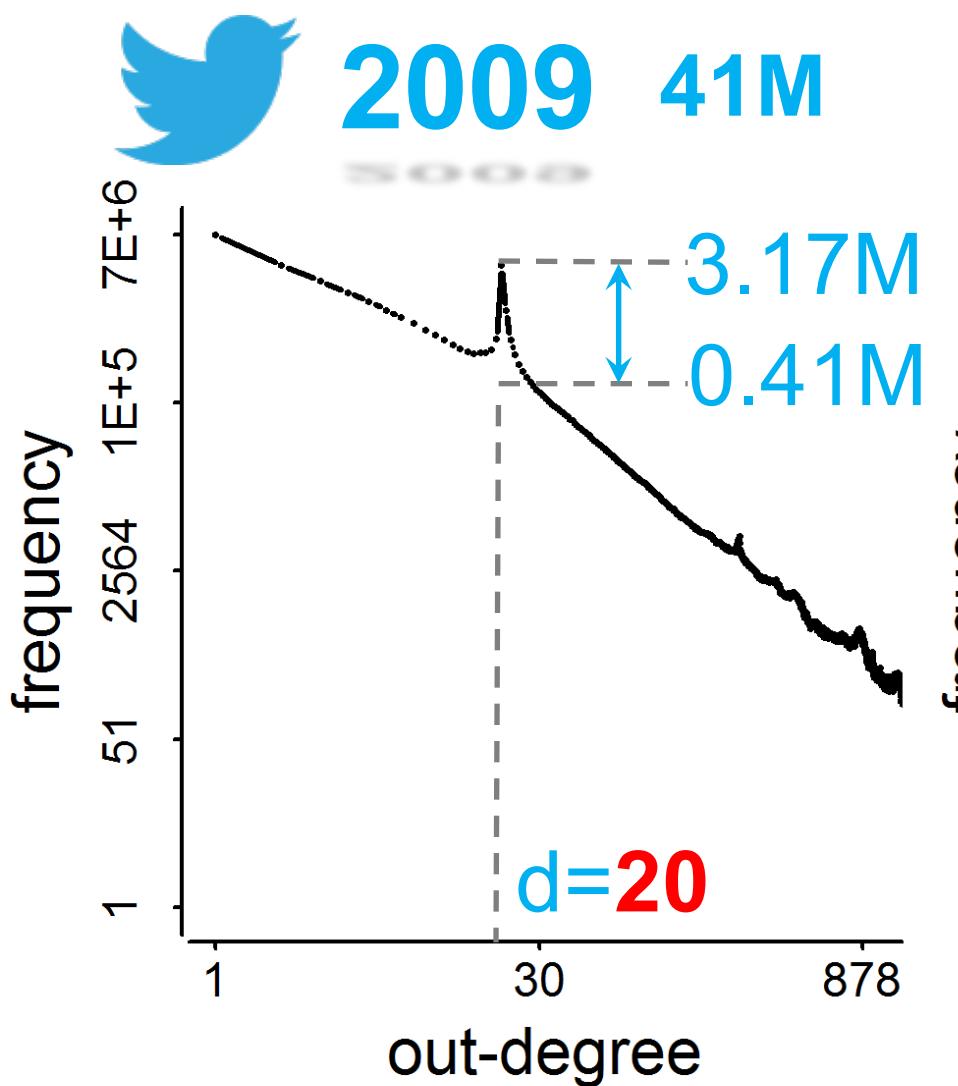
❖ Selling Facebook Likes

25,000 Facebook Likes \$265	50,000 Facebook Likes \$525	100,000 Facebook Likes \$1,000	200,000 Facebook Likes \$1,750
Lifetime Replacement Warranty	Lifetime Replacement Warranty	Lifetime Replacement Warranty	Lifetime Replacement Warranty
Dedicated 24/7 Customer Service	Dedicated 24/7 Customer Service	Dedicated 24/7 Customer Service	Dedicated 24/7 Customer Service
100% Risk Free, Try Us Today	100% Risk Free, Try Us Today	100% Risk Free, Try Us Today	100% Risk Free, Try Us Today
Order starts within 24 - 48 hours	Order starts within 24 - 48 hours	Order starts within 24 -48 hours	Order starts within 24 -48 hours
Order completed within 22 days	Order completed within 35 days	Order completed within 35 days	Order completed within 35 days

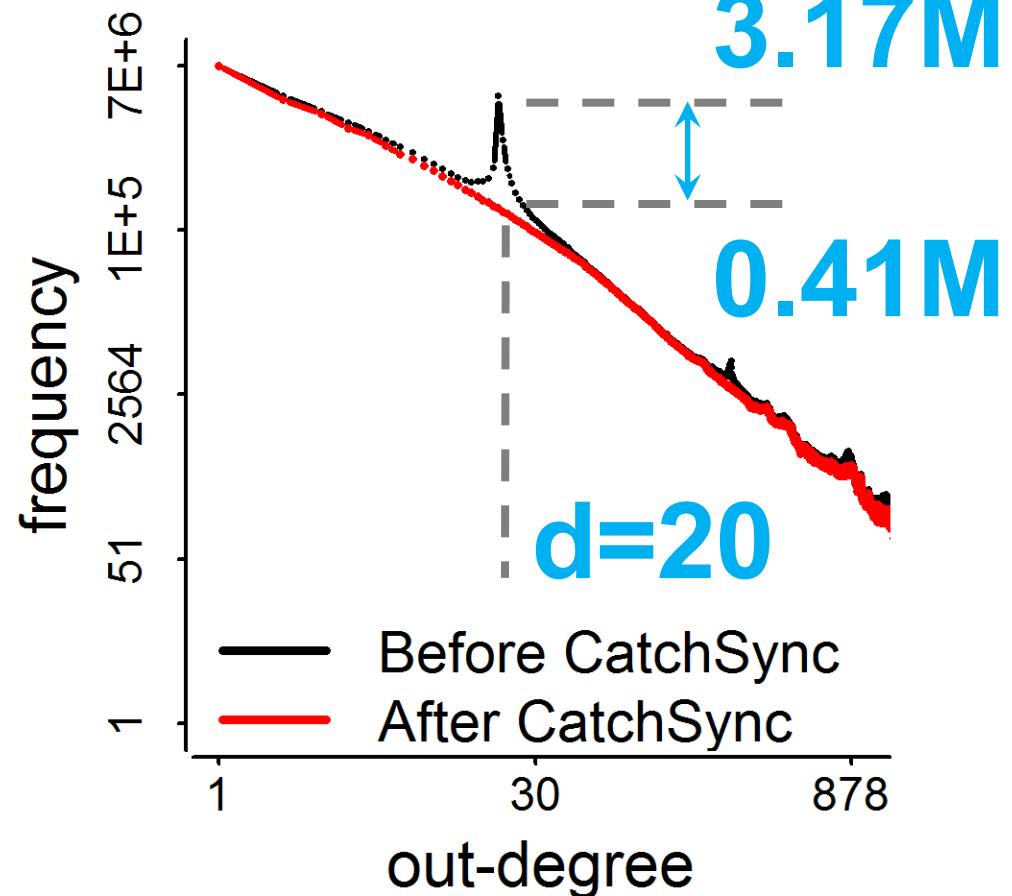
Power-Law Distribution

❖ Out-degree distribution

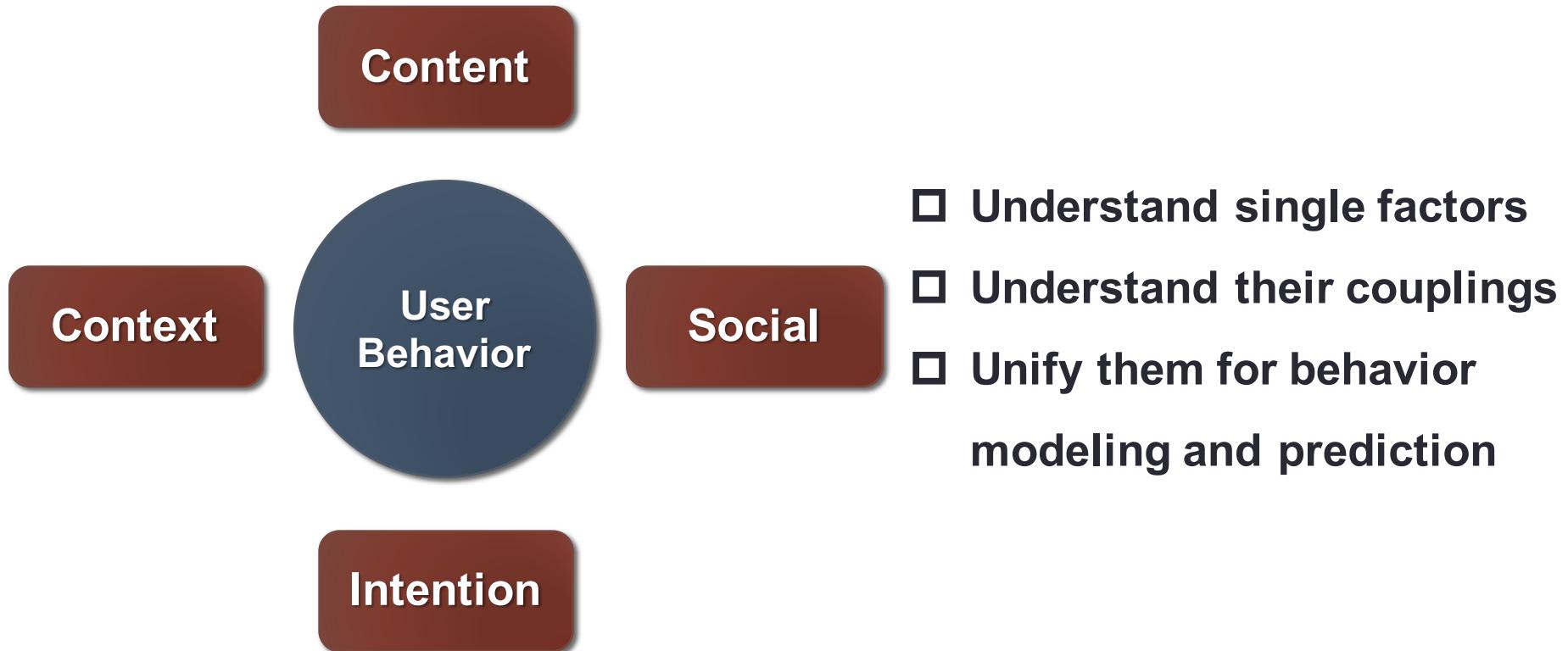




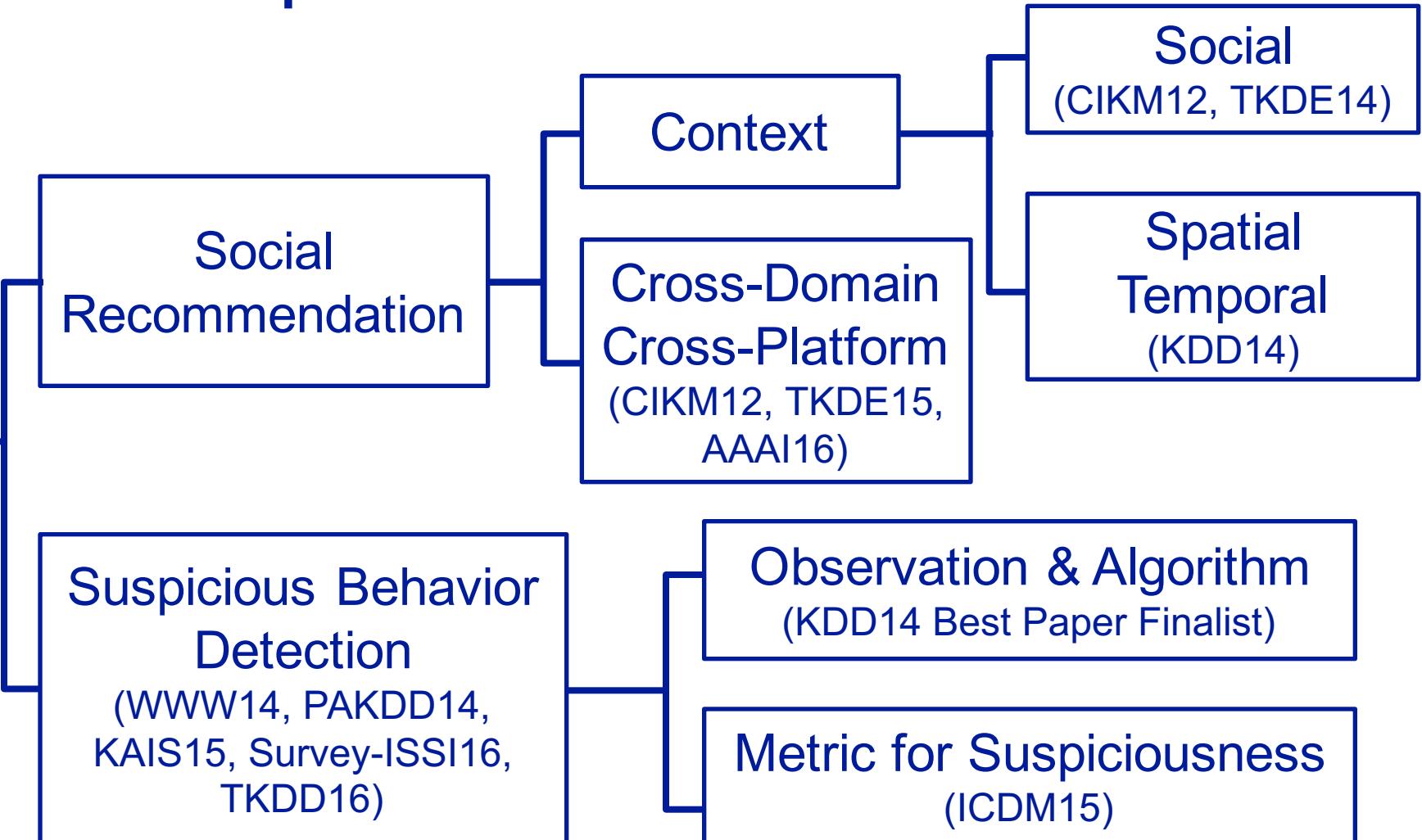
Catch from Twitter



Behavioral Modeling



Roadmap



Acknowledge



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Acknowledge



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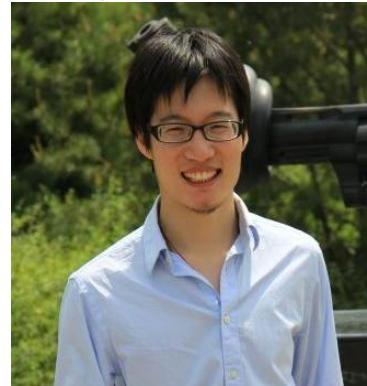
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Tsinghua U



Prof. Peng Cui
Tsinghua U



Alex Beutel
CMU

THANK YOU!

Modeling Complex Behavior in Social Media

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