Characterizing User Behavior in Online Social Networks

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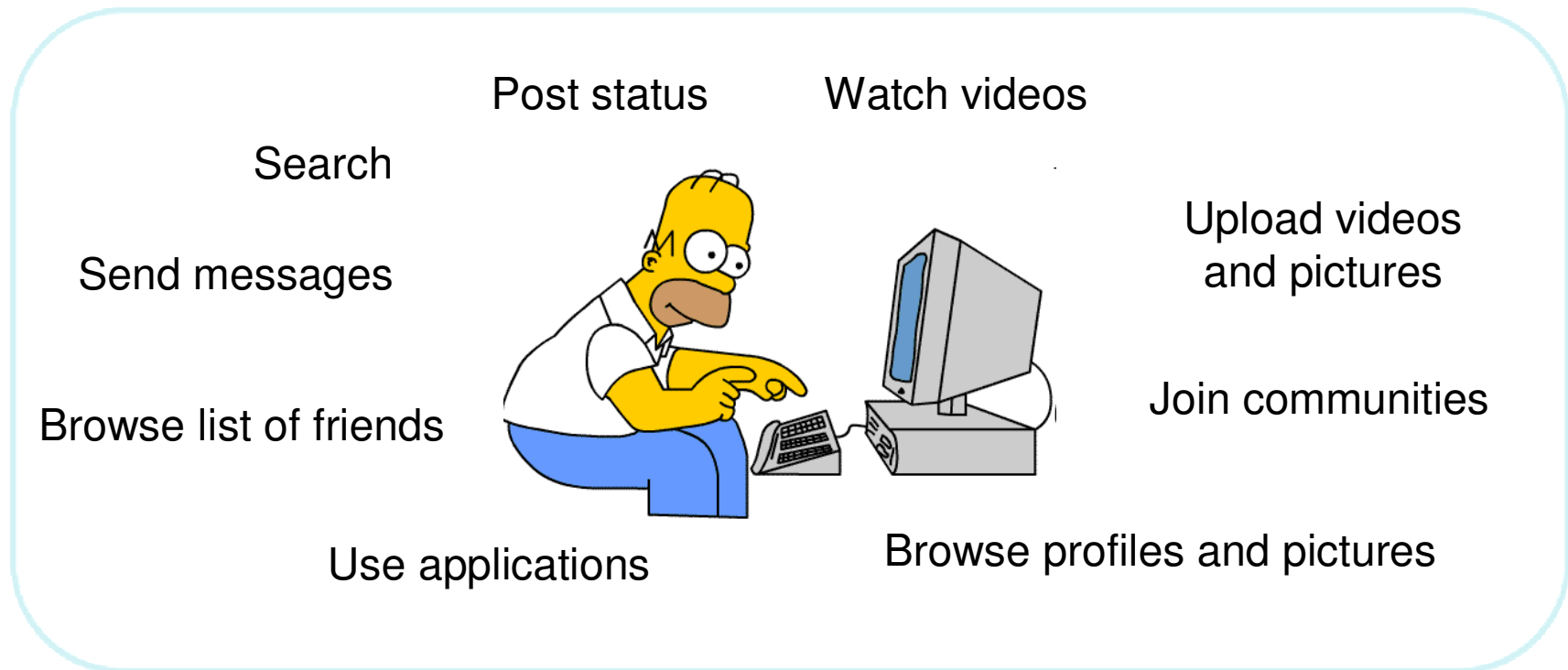
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What do users do in OSNs?

Post status

Watch videos

Search

Upload videos and pictures

Send messages

Browse list of friends

Join communities

Use applications

Browse profiles and pictures

Understanding user behaviors in OSNs is useful for better design of interface and content distribution

Goals

1) Characterize user navigation patterns in OSN
   - ✓ Frequency, time spent, and sequence of activities

2) Understand social interaction patterns in OSN
   - ✓ Study patterns based on not one, but all activities

Part1.
Data and statistics
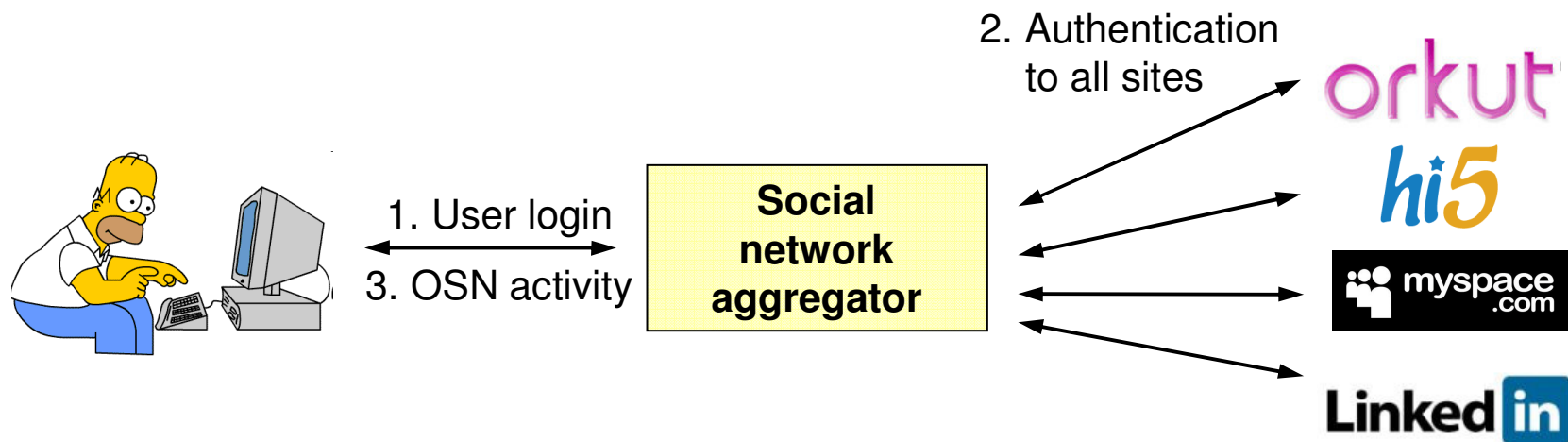
Part2.
Navigation patterns

Part3.
Social interactions

Measurement methodology

We obtained clickstream data from a
popular online social network aggregator

2. Authentication
to all sites

1. User login

3. OSN activity

Social
network
aggregator

orkut

hi5

myspace
.com

Linked in

Clickstream data

- 12 days (Mar 26–April 6, 2009)
- HTTP session summaries
  - User ID and session ID, URL, timestamp, IP address, traffic bytes

OSNs	# users	# sessions	# requests
Orkut	36,309	57,927	787,276
Hi5	515	723	14,532
MySpace	115	119	542
LinkedIn	85	91	224
Total	37,024	58,860	802,574

- We crawled the list of friends of Orkut users

Session and access characteristics
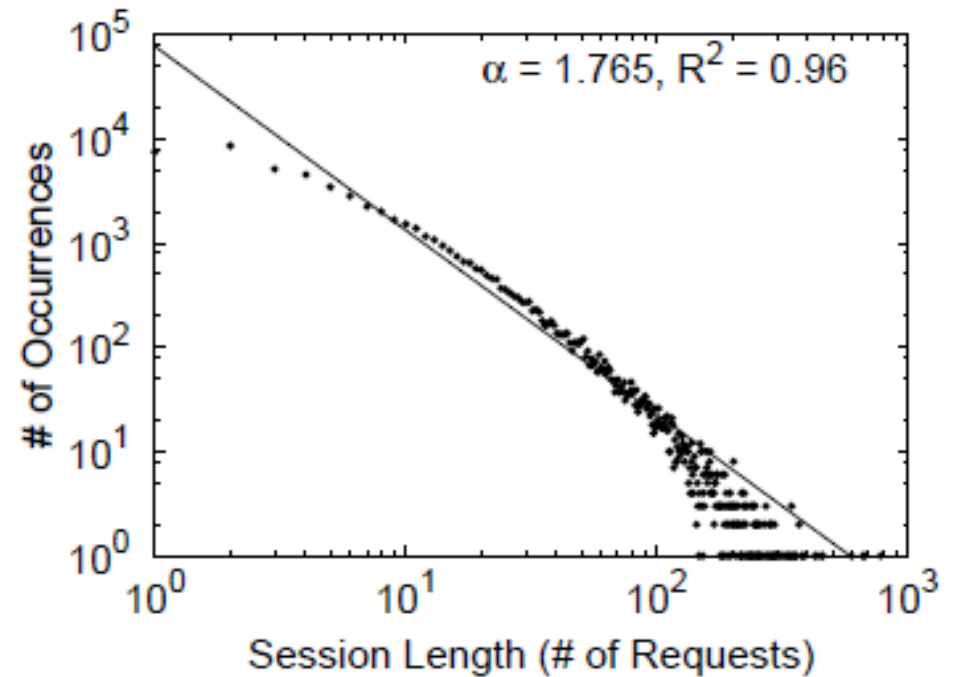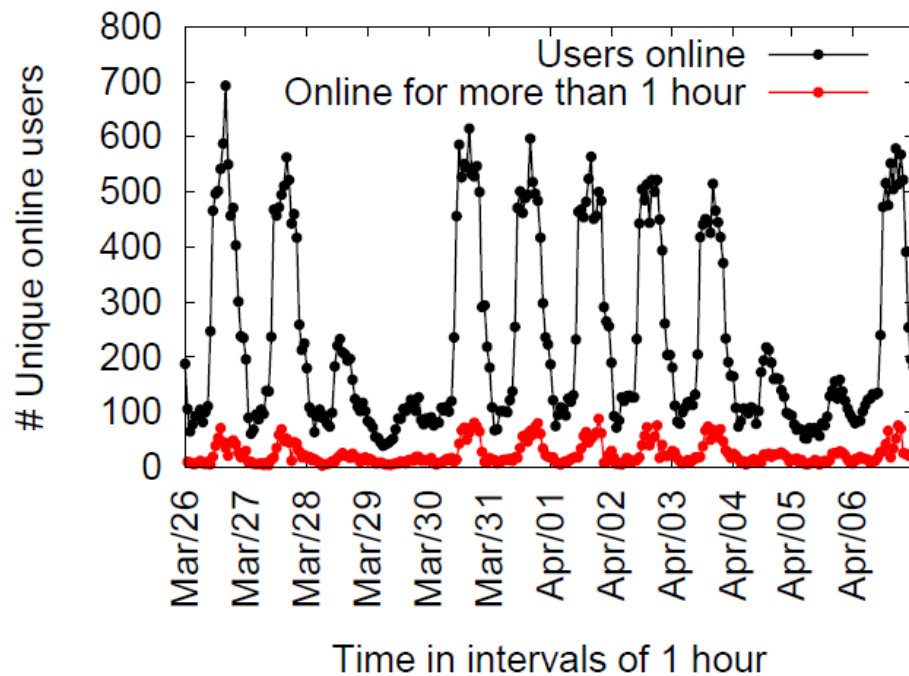
- <u>Session definition</u>: 20 min timeout, close browser, or logoff
- Provide best fittings for other distributions:
  – inter-session time, inter-request time, session duration
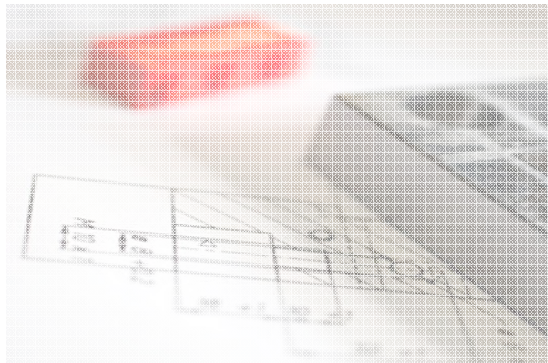
Part1.
Data and statistics

Part2.
Navigation patterns

Part3.
Social interactions

Profiling activities

User Activities in Orkut

Profile & Friends

Browse profile, homepage, list of friends, friend updates, members of communities, fans, etc.

Scrapbook

write
browse

Photos

Edit/Organize photos browse photos, albums, photos, list of albums, comments in photos, photos tagged

Messages

write
browse

Communities

join/leave
post in topics
browse communities, topics, list of communities, etc.

Videos

browse list of favorites
watch a video

Testimonials

write
browse written and received

Search

Others

Applications
user settings
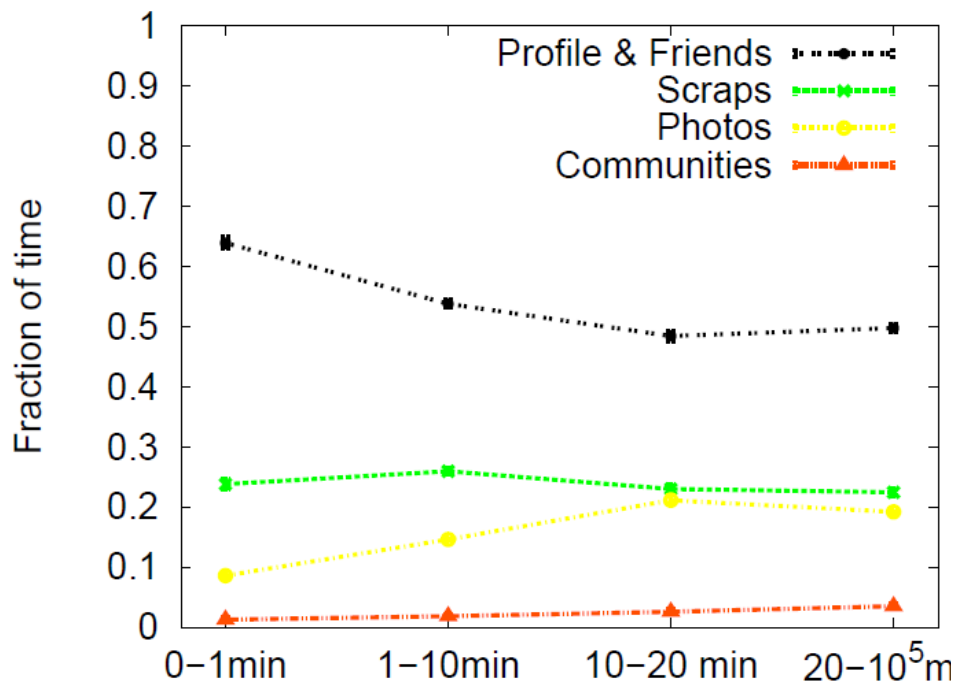
Browsing accounts for 92% of all activities!
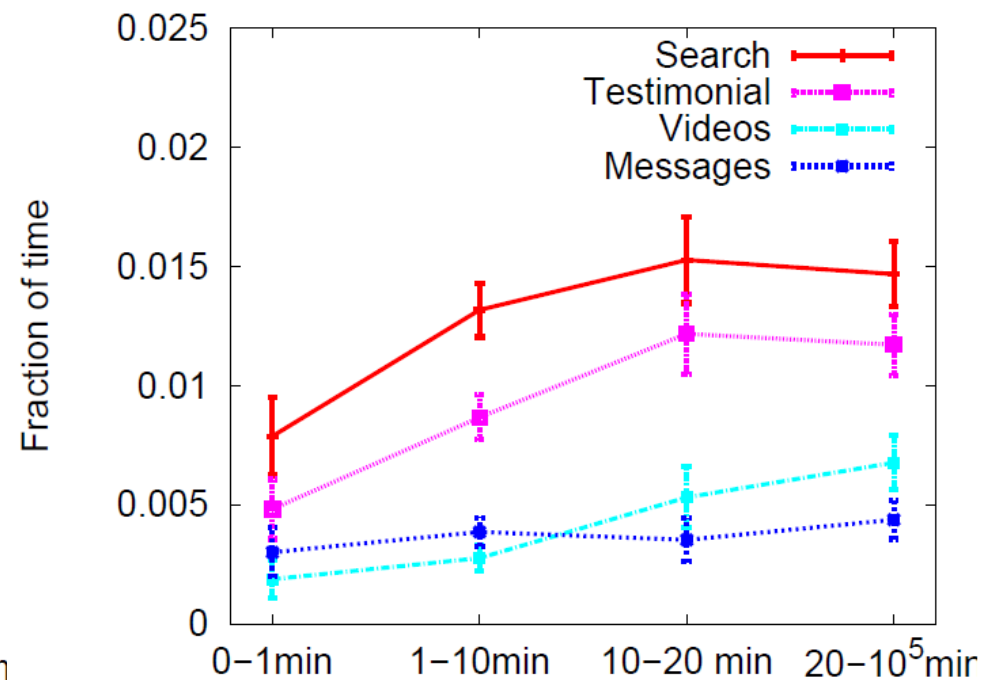
Sequence of activities
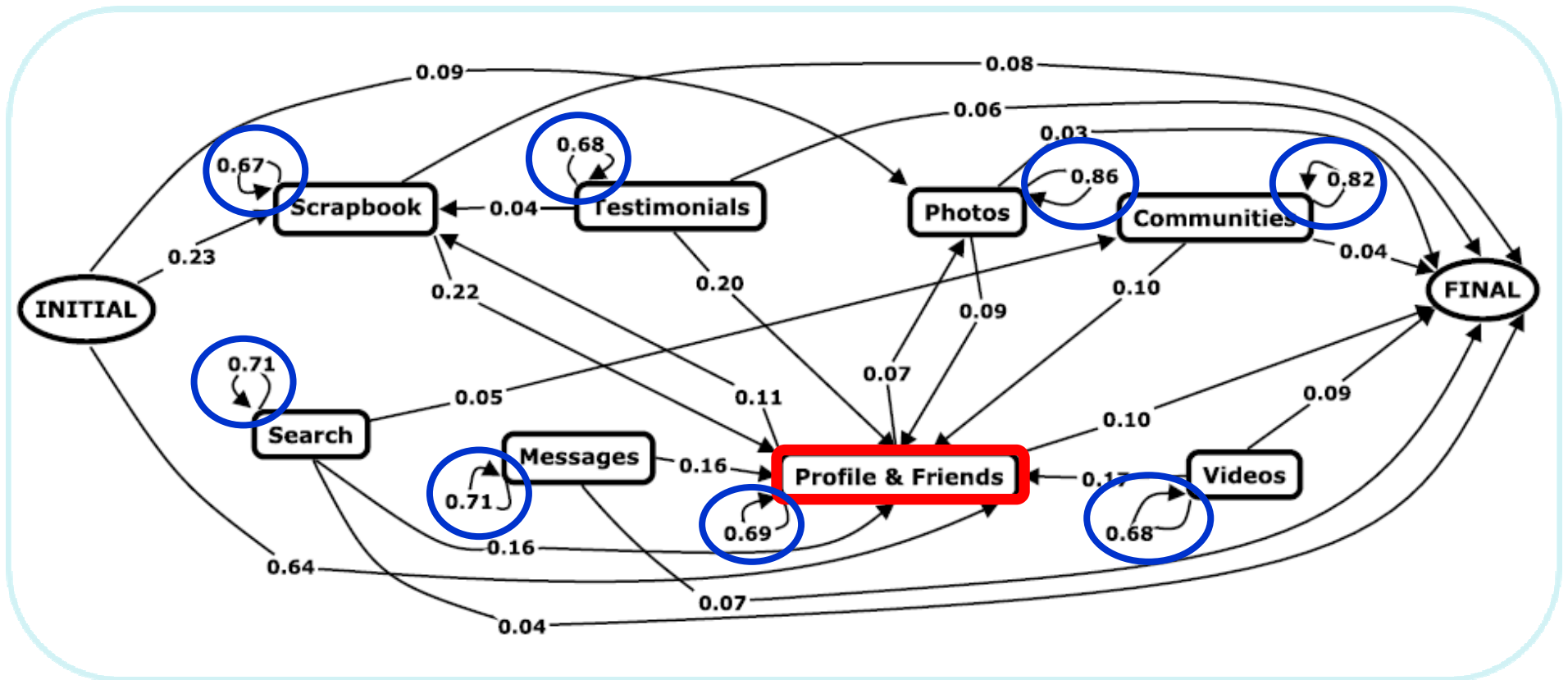
- Profile & Friends plays a central role
- Self-loops are dominant in all categories
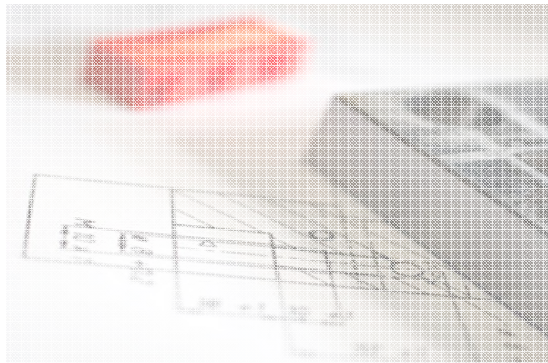
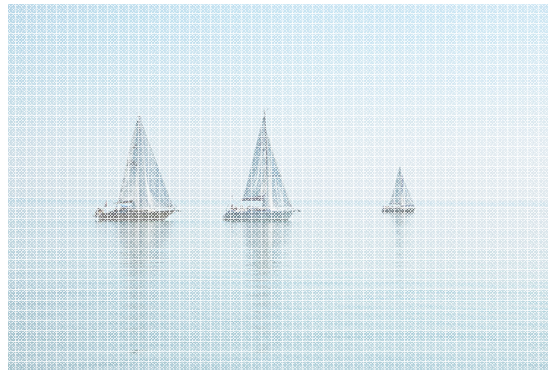# Activities and session duration

Top-4 activities   **Bottom-4 activities**

- Longer sessions usually involve diverse activities
- Profile, scrapbook, and photos are the most popular activities, regardless of the session duration
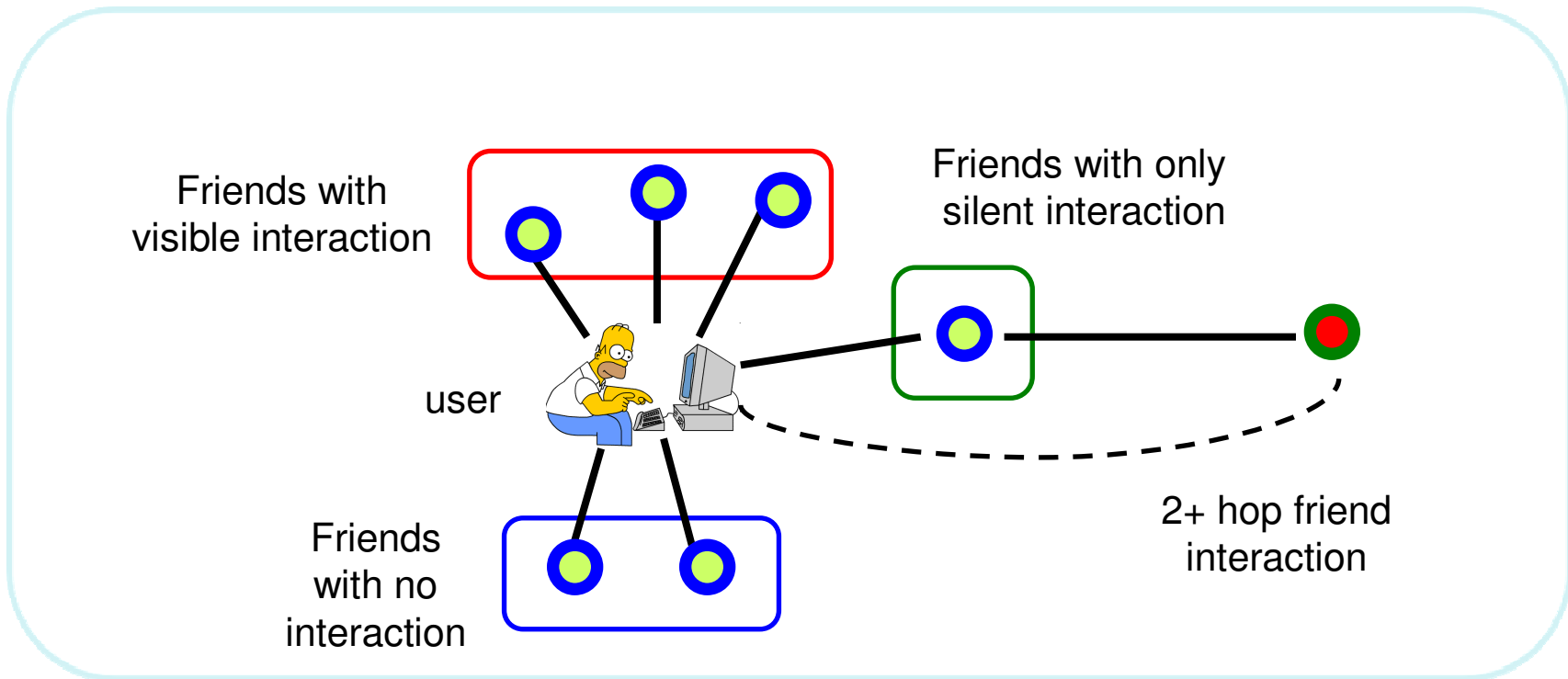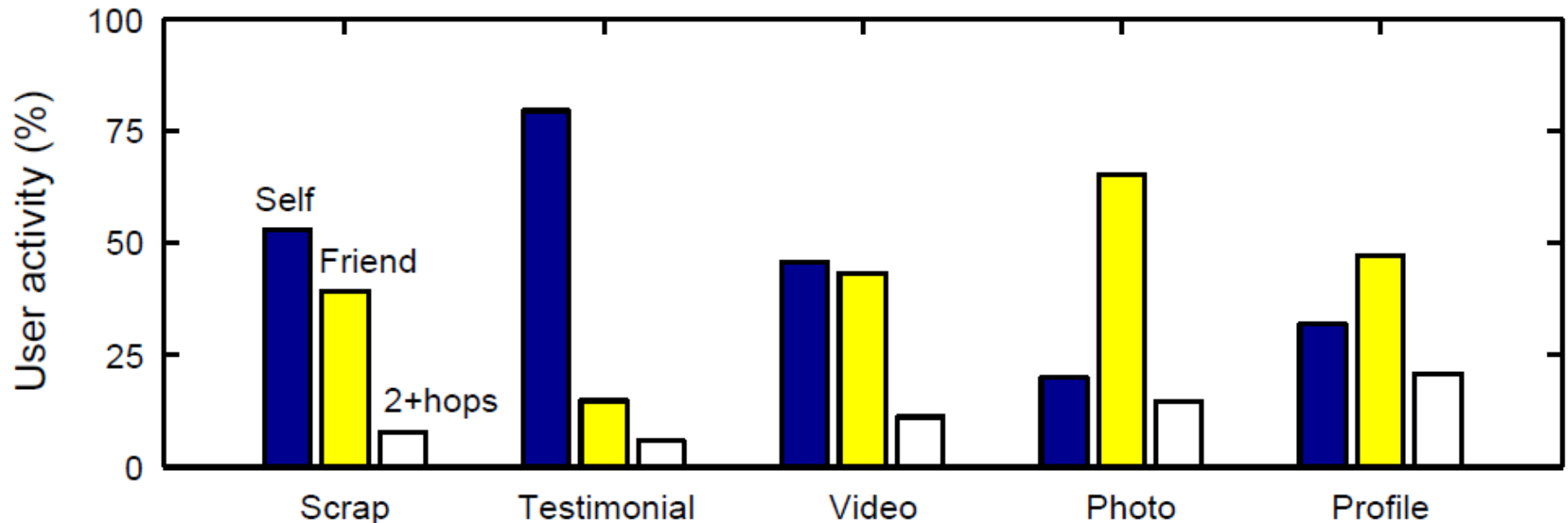
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Part1.
Data and statistics

Part2.
Navigation patterns

**Part3.
Social interactions**

Social interactions

- **Visible interactions**: Write messages, scraps, testimonials
- **Silent interactions**: Browse profiles, pictures, etc.
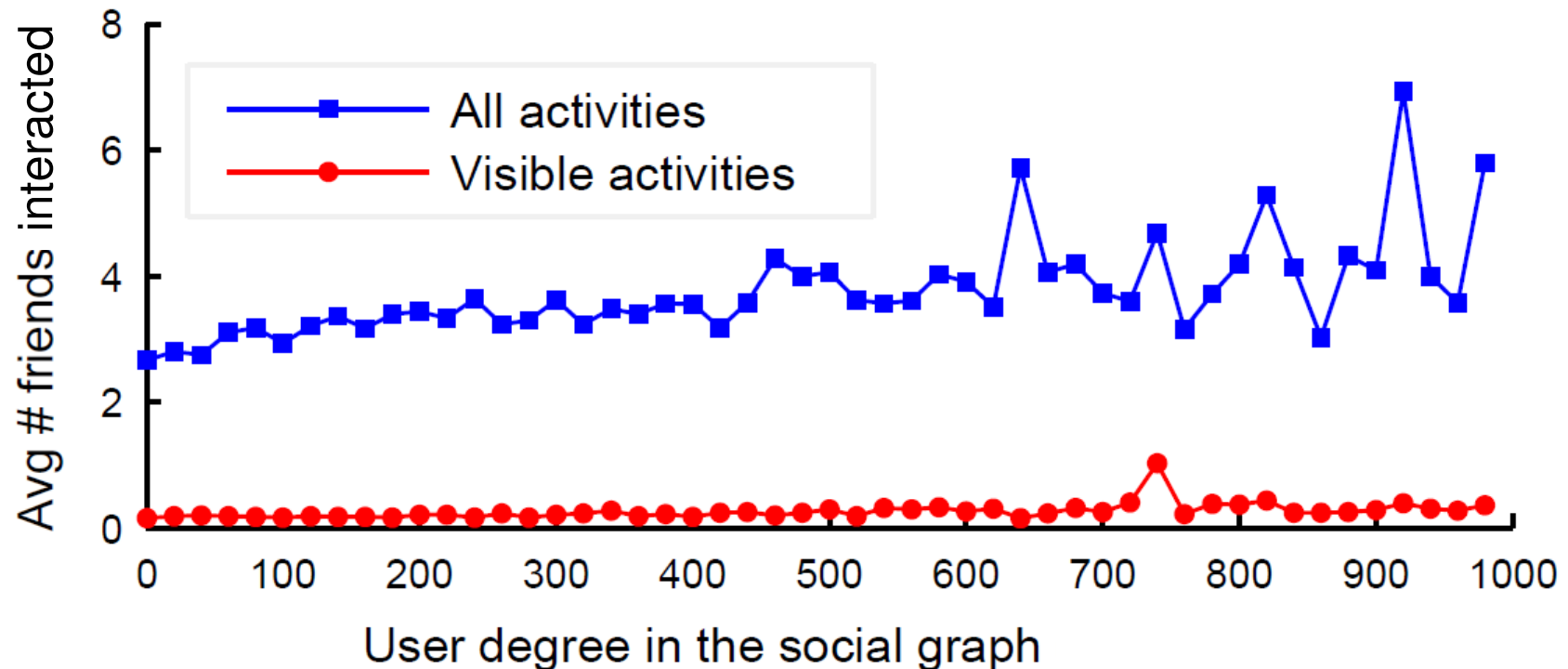
Interaction along the social distance

- Users access their 1-hop friends' pages most frequently
- Interaction with 2+ hops friends is not negligible
  - Usually associated with content discovery through social links

Number of friends a user interacts with

- Degree of interaction increases by an **order of magnitude** when incorporating silent interactions
- 85% of the active users showed **only silent interactions**!

Conclusions

- First study of OSN workload considering both visible and silent social interactions

- Clickstream-based analysis highlighted new insights on user behaviors in OSNs

- Statistics and best fitting distributions of user sessions can be used to generate synthetic workloads

Questions?

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