

# **Human dynamics revealed through Web analytics**



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## Outline

- **Web surfing, our database**
- **Population dynamics**
- **Inter-event statistics**
- **Preferential linking**
- **Conclusions**

# Web Surfing at Emory University



## Web surfing



<http://www.emory.edu>

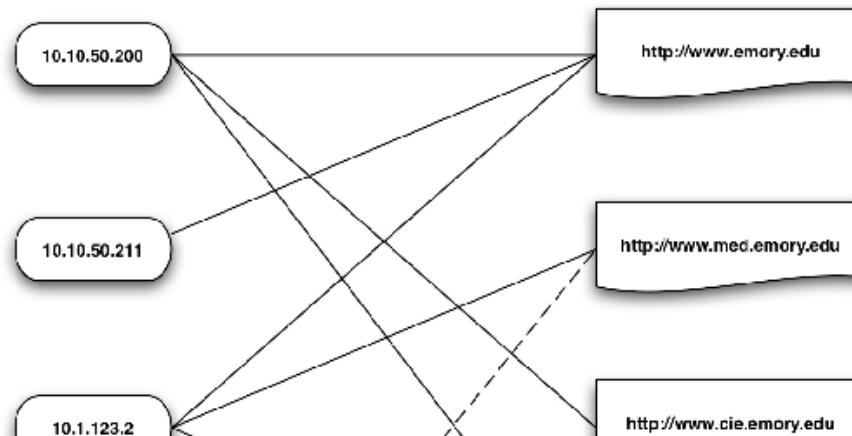


<http://www.physics.emory.edu>



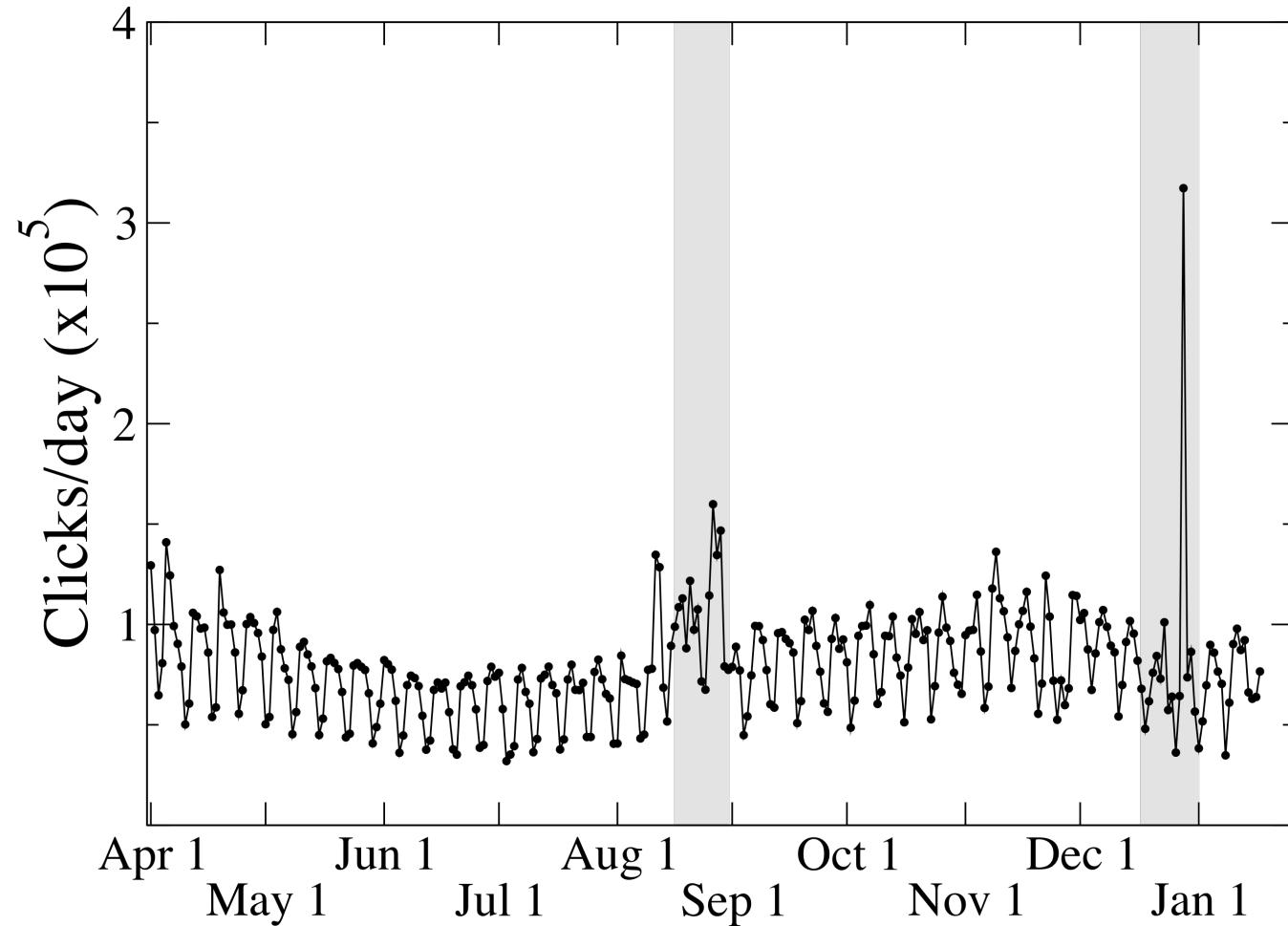
## Web Surfing

- The database is formed by the weblogs of Emory University from Apr. 1st 2005 to Jan. 17th 2006 (41 weeks).
- Each click in a web of the university is registered at the time resolution of 1 second.

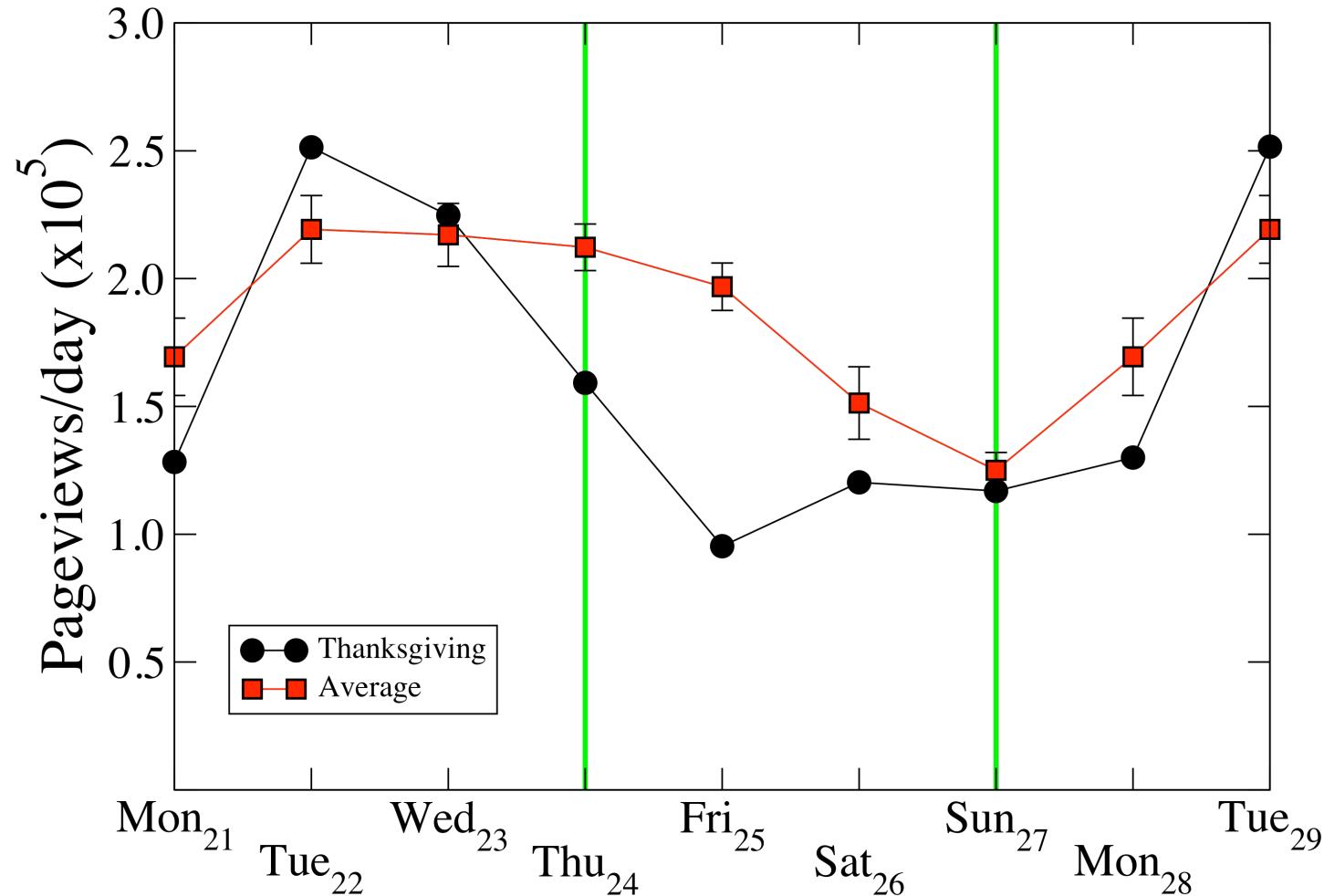


Number of IPs	$N_{IP}$	3,179,671
Number of URLs	$N_{URL}$	2,562,398
Total Number of page requests (weight)	$\Omega$	53,582,121
Average number of IPs introduced per day	$n_{IP}$	10,742
Average number of URLs introduced per day	$n_{URL}$	8,396
Average number of edges introduced per day	$e$	77,569
Average weight increment per day	$\Omega^\dagger$	186,350

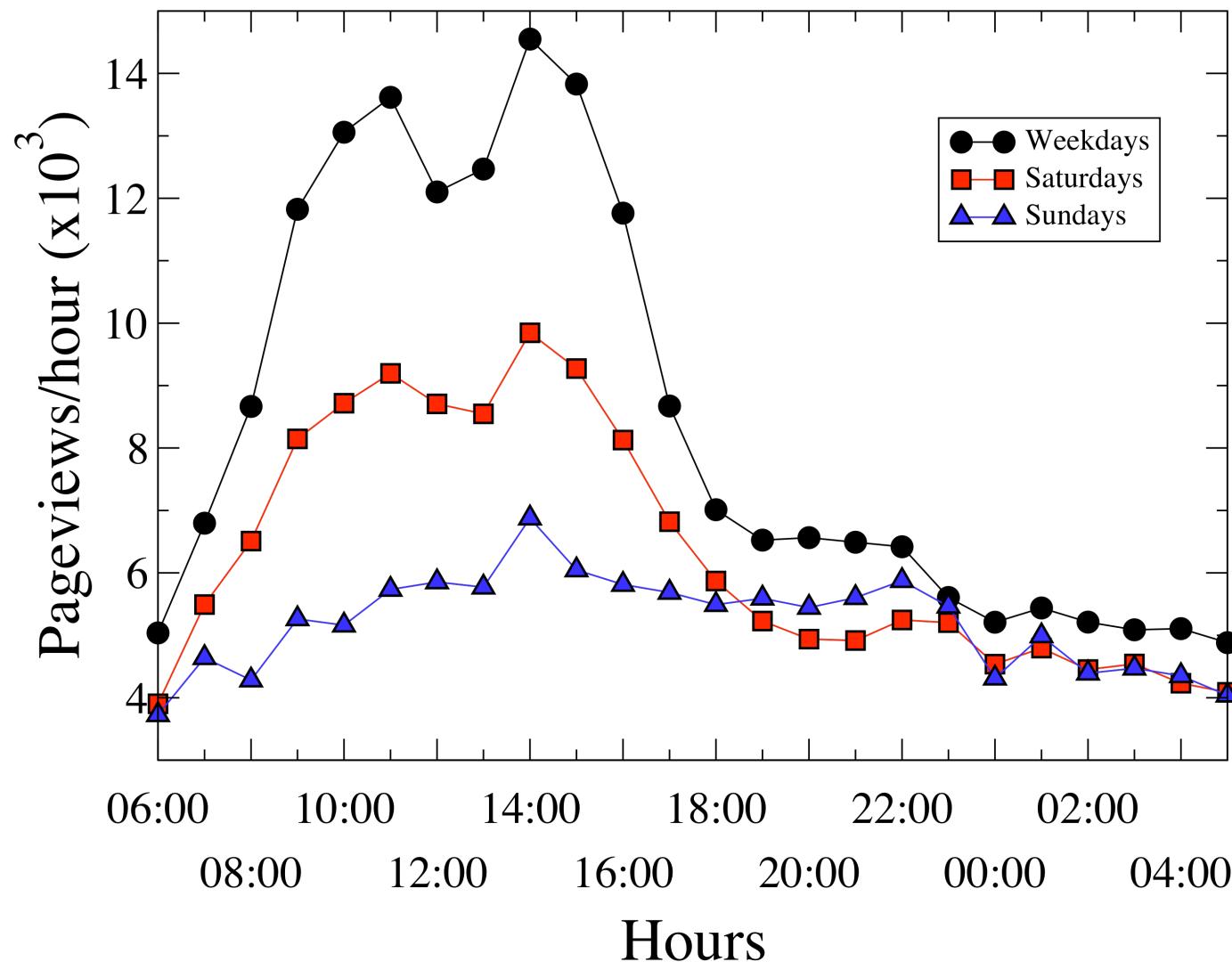
## Population dynamics



## Population dynamics

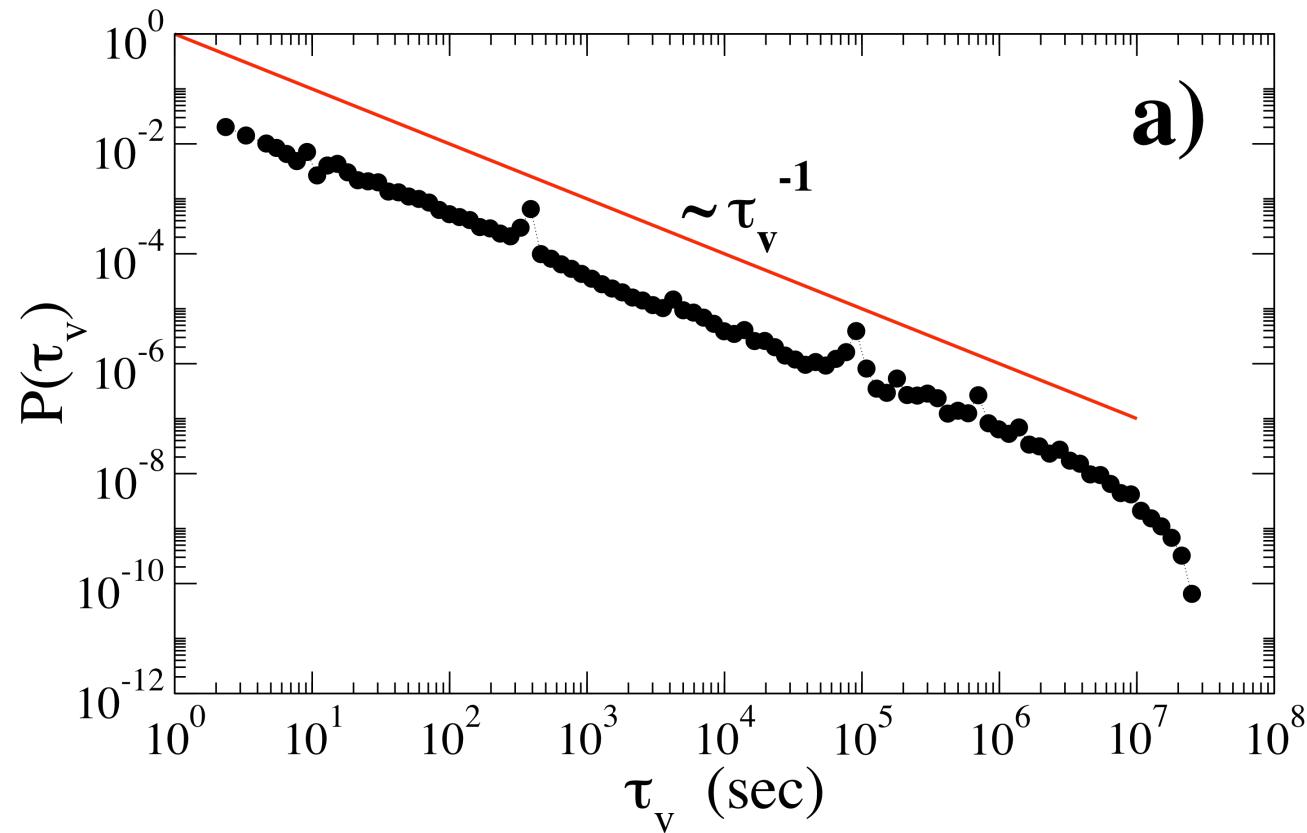


# Population dynamics

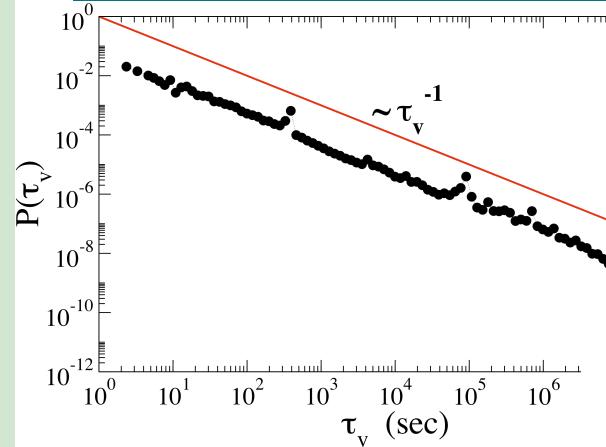


## Inter-event time statistics

IP → [www.x.edu/yy.html](http://www.x.edu/yy.html)

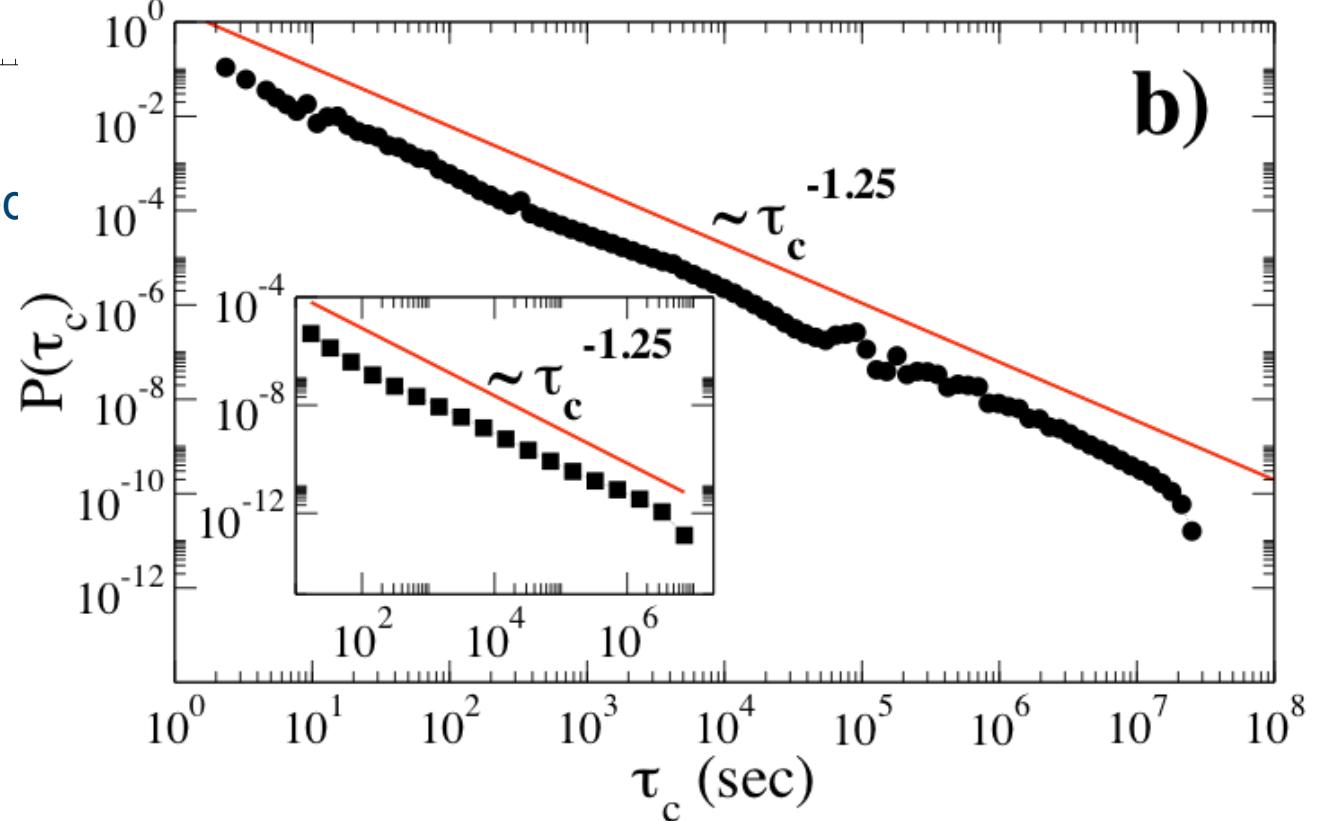


## Inter-event time statistics



a)

IP → [www.x.emory..ec](http://www.x.emory..ec)

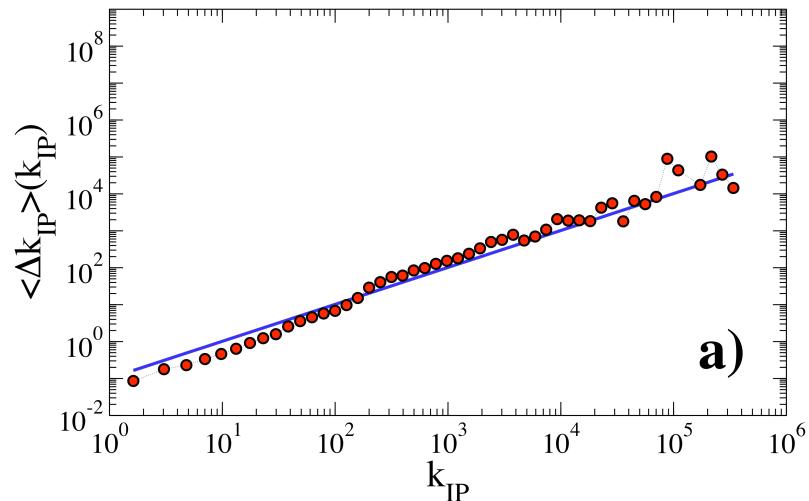


b)

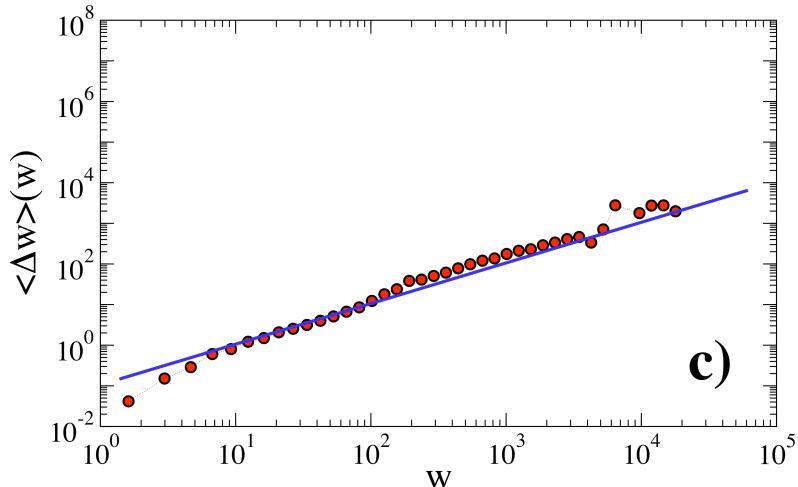
IP → [www.x.emory.edu/\\*](http://www.x.emory.edu/*)

# Preferential linking

Users

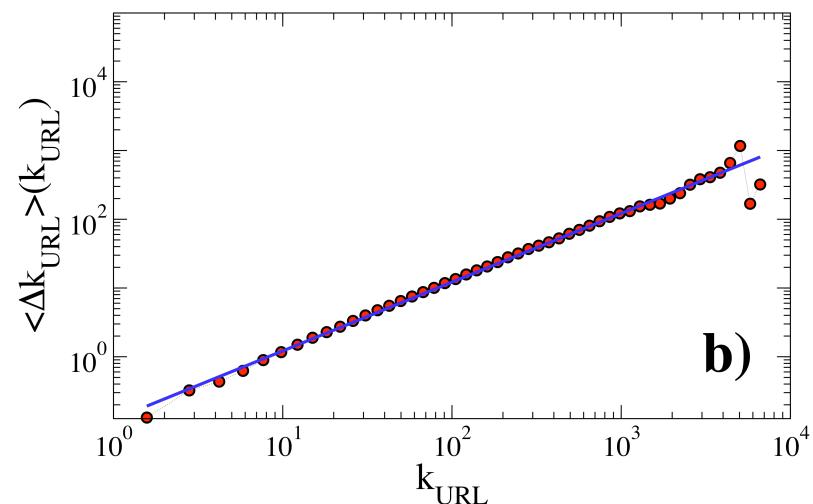


Users-Webs



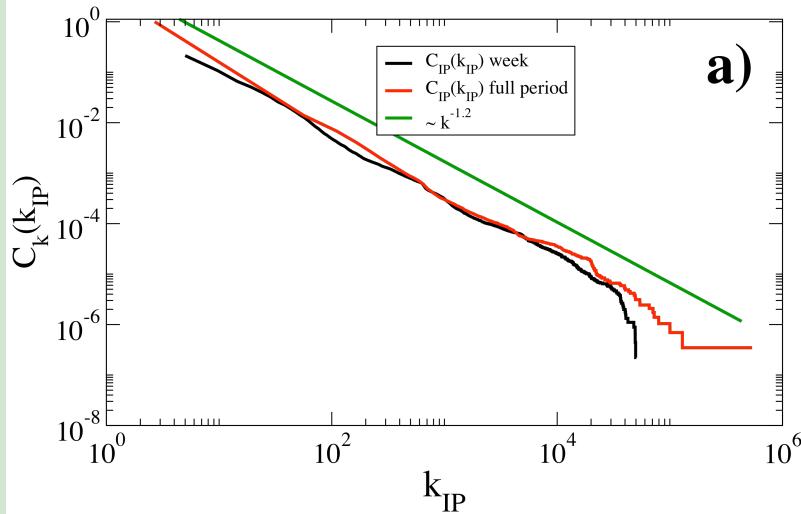
$$\langle \Delta x \rangle = ax + b$$

Webs



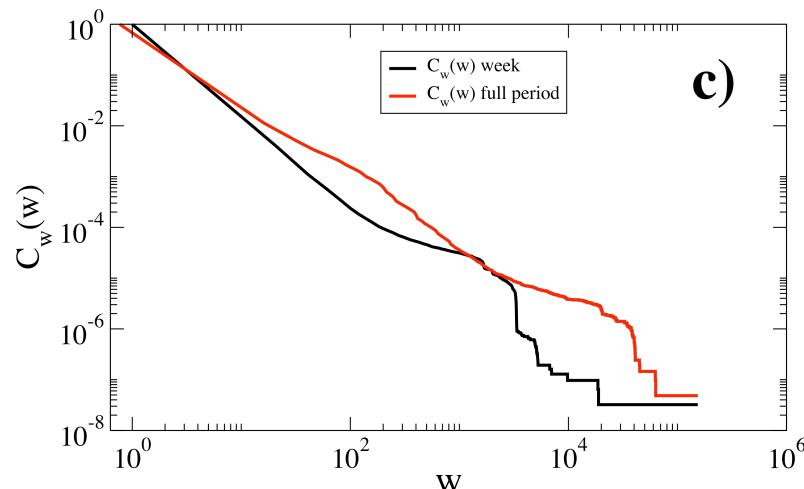
# Preferential linking

Users



a)

Users-Webs

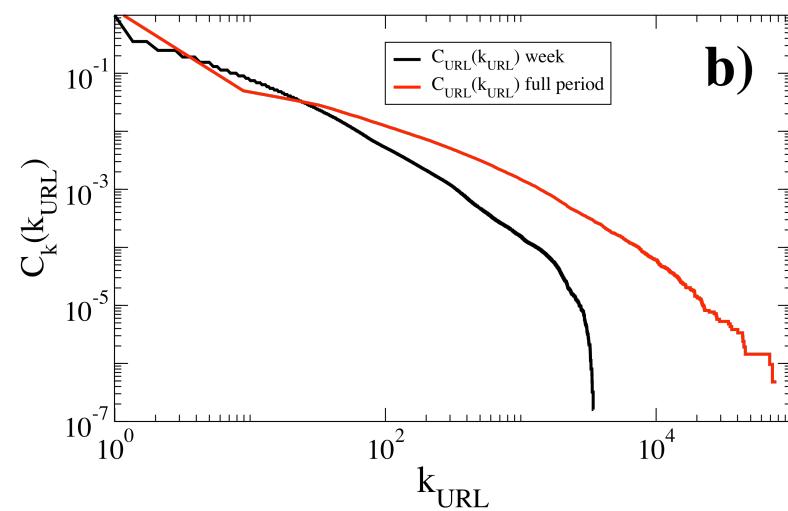


c)

$$P(x) \sim x^{-\gamma(a,b)}$$

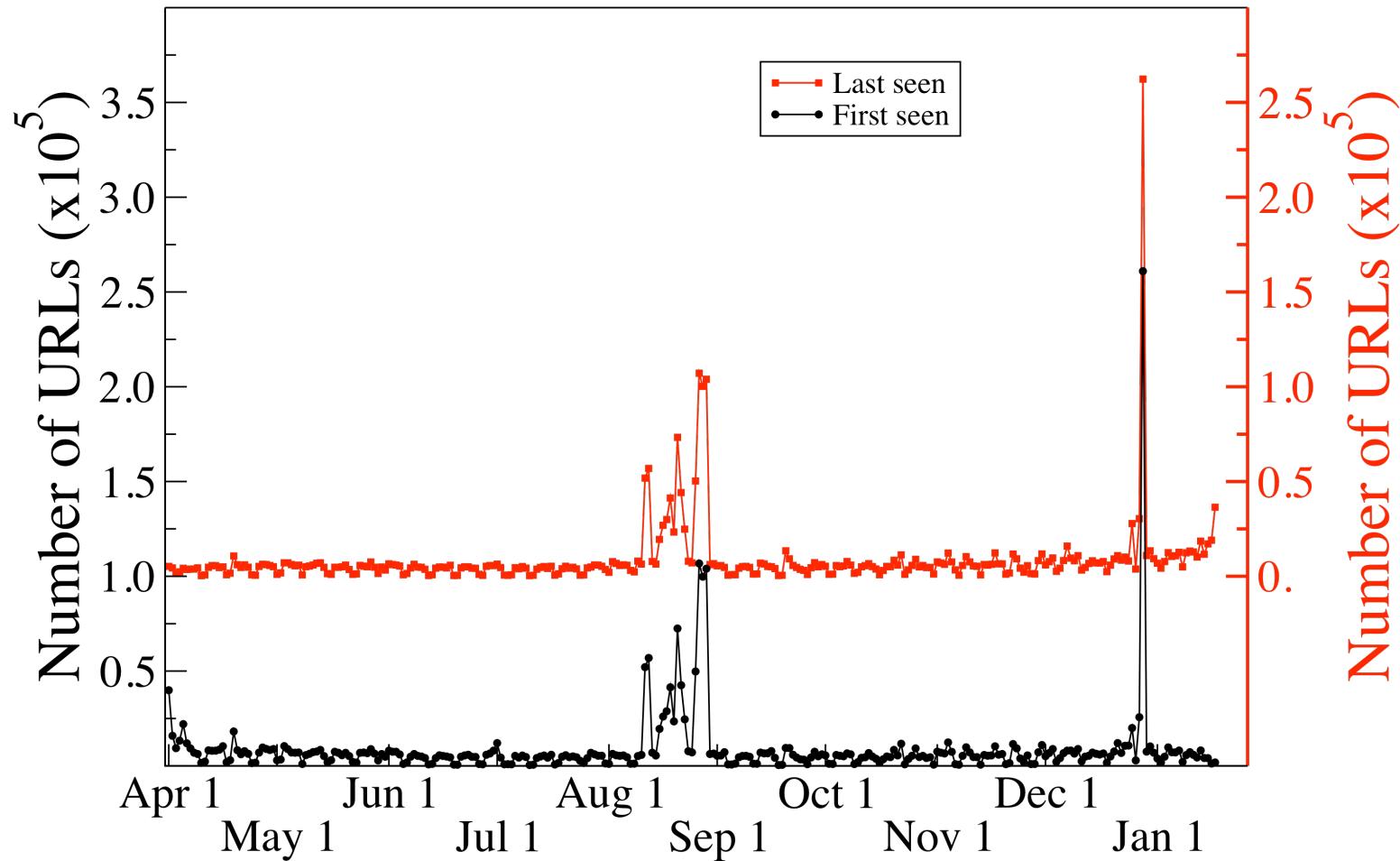
$$C_x = \int_x^\infty P(x') dx'$$

Webs



b)

## Preferential linking



## Conclusions

- We have studied a huge empirical database accounting for user-Web interactions.
- These data allow us to consider the activity patterns of the whole community.
- Priority queuing and preferential linking play an important role on how users navigate but so does also aging of the contents.
- Open questions ...