

The Rise of Social Bots

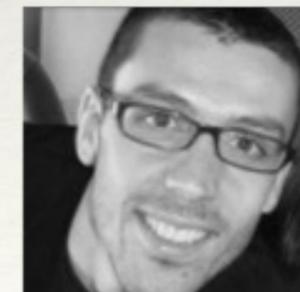
Overview of the impact of bots

- ❖ The strange case of Iajello
- ❖ The path to botometer
- ❖ The impact of bots on disinformation diffusion
- ❖ Case study: the interplay between bots and low quality information diffusion in the Italian debate on immigration on Twitter

The strange case of Lajello



LUCA
AIELLO



ROSSANO
SCHIFANELLA



MARTINA
DEPLANO



GIRO
CATTUTO



ALAIN
BARRAT

Analyzing social network with a bot

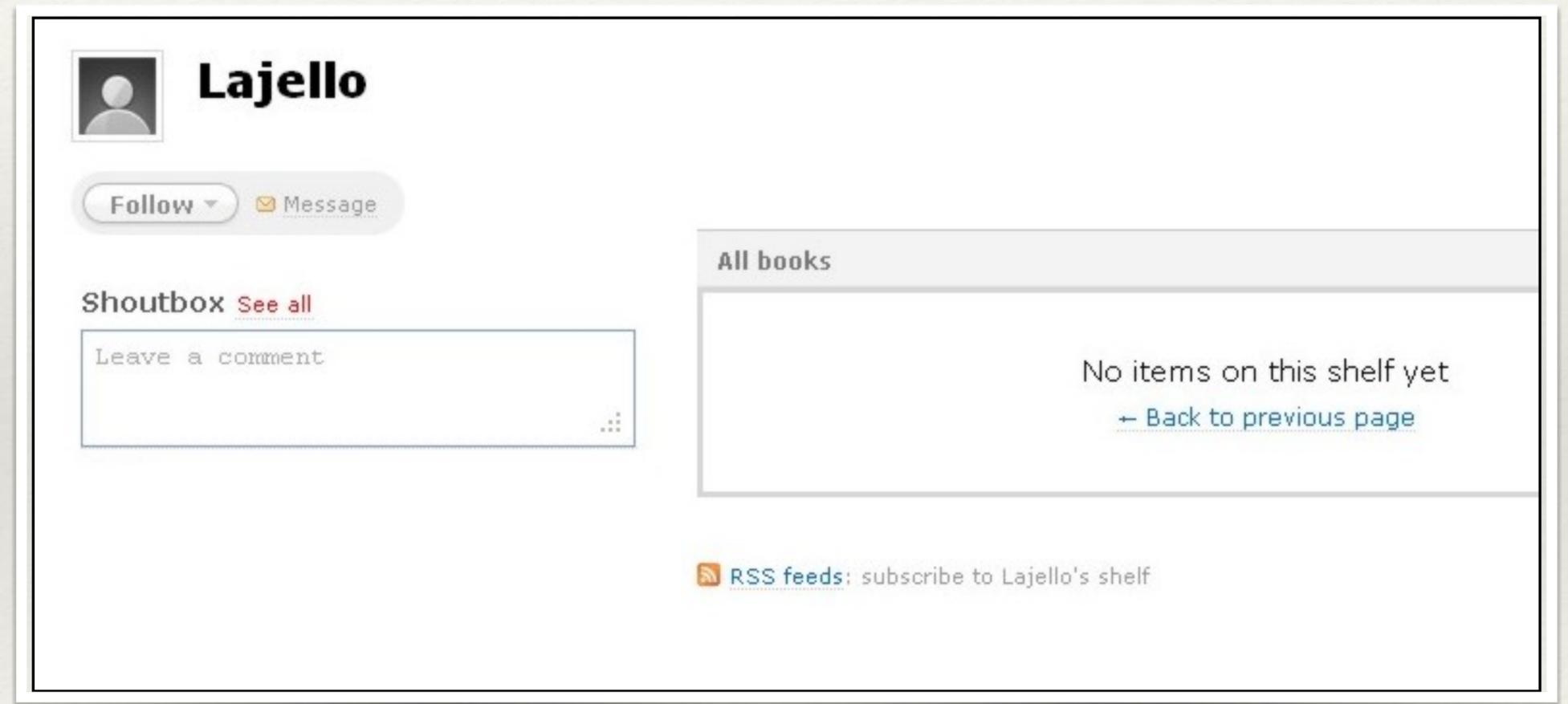
- ❖ Anobii was a social networks for book lovers
- ❖ Scraping users' profiles from the Web was admitted
- ❖ Users' libraries and their links were collected periodically



A screenshot of an Anobii user profile for a user named "Claudia A.". The profile includes a user avatar, a bio stating "Female, 38, Single. Torino, Italy", and buttons for "Follow" and "Message". Below this is a "Taste compatibility: UNKNOWN" section with a link to "Add more books to match". There are four filter tabs: "By Progress", "By Authors", "By Languages", and "By Tags". A "Groups" section lists several book-related groups with their member counts. At the bottom, there is a "Shoutbox" with a "See all" link and a "Leave a comment" input field. The main content area shows a "Books (126)" section with a search bar and a grid of book covers. The books are arranged in three rows. The first row includes "Paths Beyond Ego", "Joseph Campbell: Pathways to Bliss", "Karen Miller: The Empress", "Kyra" by Carol Gilligan, and "The Portable Jung". The second row includes "Official Guide to the NEW TOEFL", "Integral Life Practice", "Ken Wilber: Integral Spirituality", "The Unfolding Now", and "Space User Inquiry". The third row includes "Diamond Heart", "Brilliancy", "Lisa Jewell", "A.S. Byatt: The Children's Book", and "The Girl with the Dragon Tattoo" by Stieg Larsson. On the right side of the profile, there are sections for "Friends" and "Neighbors", each listing several user names with their profile pictures.

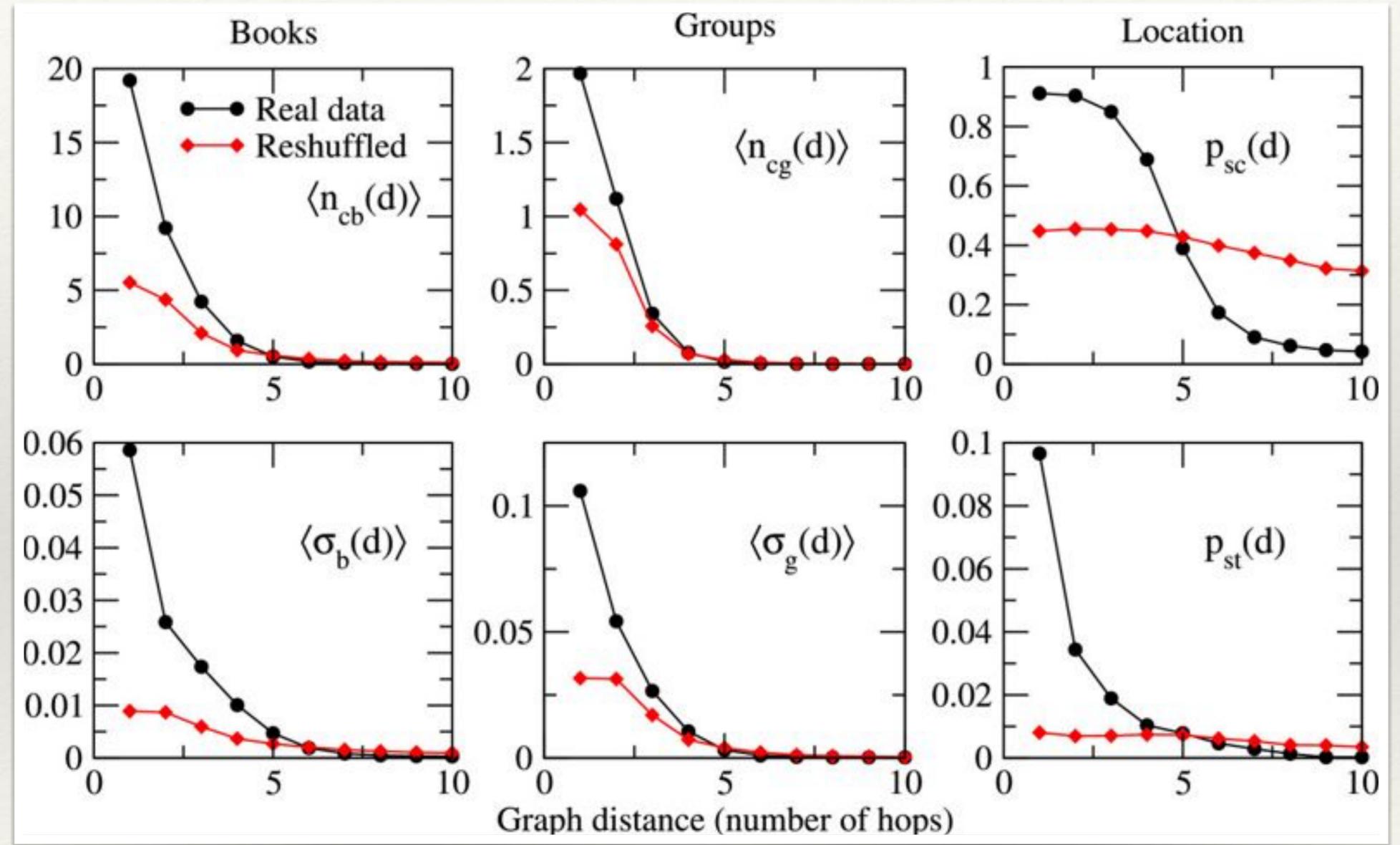
Analyzing social network with a bot

- ❖ Anobii was a social networks for book lovers
- ❖ Scraping users' profiles from the Web was admitted
- ❖ Users' libraries and their links were collected periodically
- ❖ The bot "Lajello" used to silently navigate Anobii twice a month for one year



Analyzing social network with a bot

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- ❖ Scraping users' profiles from the Web was admitted
- ❖ Users' libraries and their links were collected periodically
- ❖ The bot "Lajello" used to silently navigate Anobii twice a month for one year
- ❖ **homophily by selection and by influence analysed**

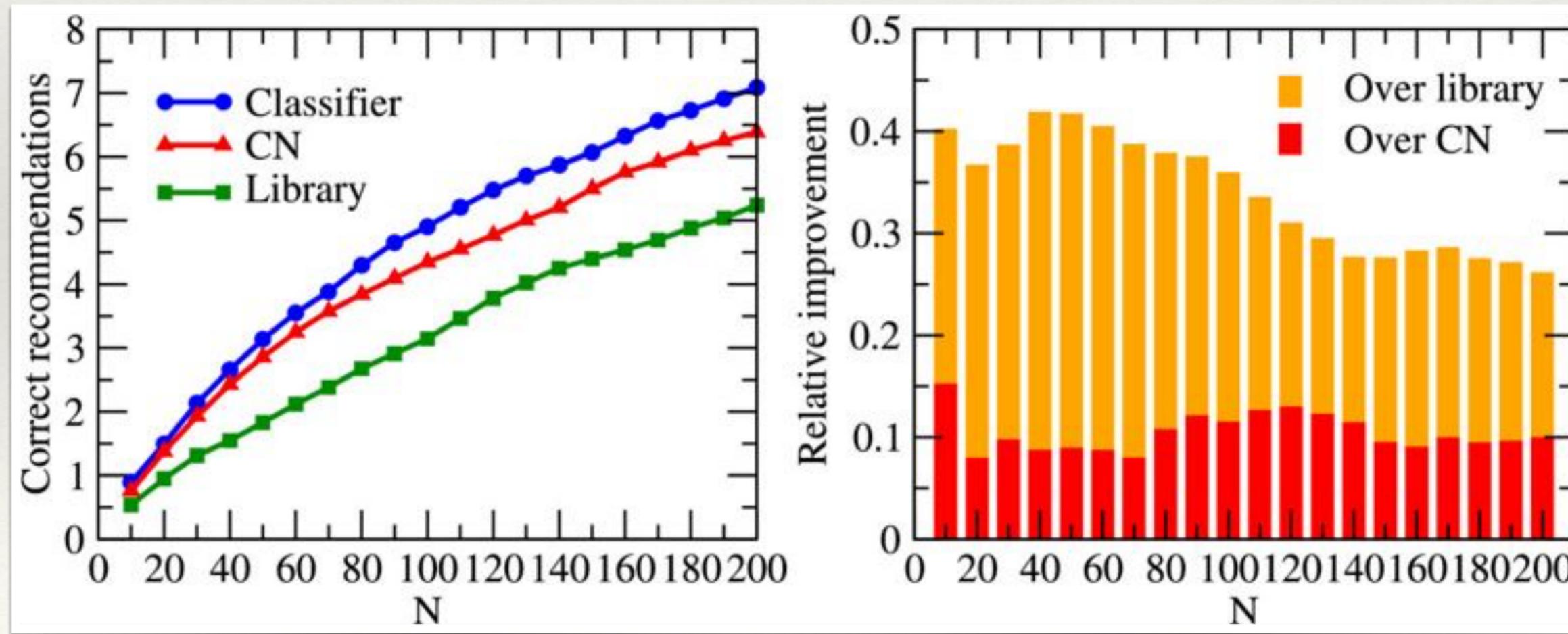


LM Aiello, A Barrat, C Cattuto, G Ruffo, R Schifanella, [Link creation and profile alignment in the aNobii social network](#), 2010 IEEE 2nd Int. Conf. on Social Computing, 249-256

LM Aiello, A Barrat, C Cattuto, G Ruffo, R Schifanella, [Link creation and information spreading over social and communication ties in interest based online social network](#), EPJ Data Science 1 (1), 12

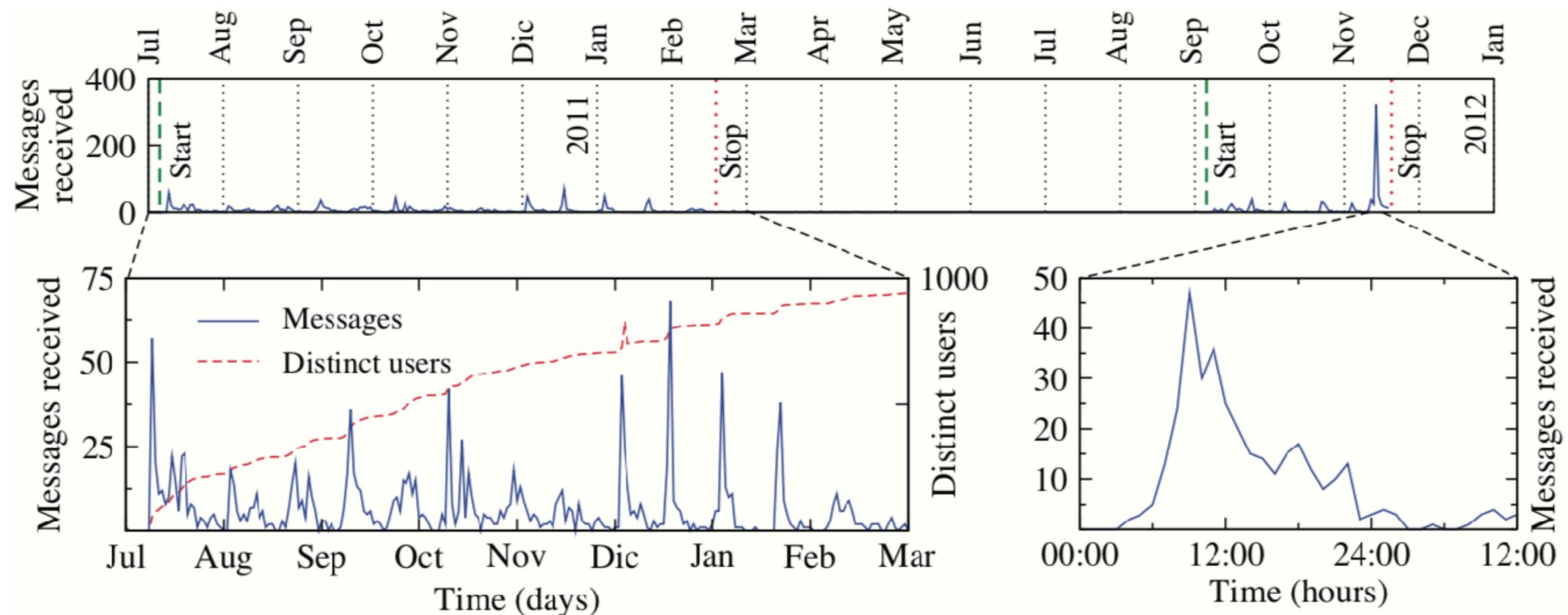
Application: a link recommendation algorithm

- ❖ A link recommendation algorithm based on prediction of profile similarities was proposed and tested
- ❖ Results showed an improvement w.r.t. the baselines



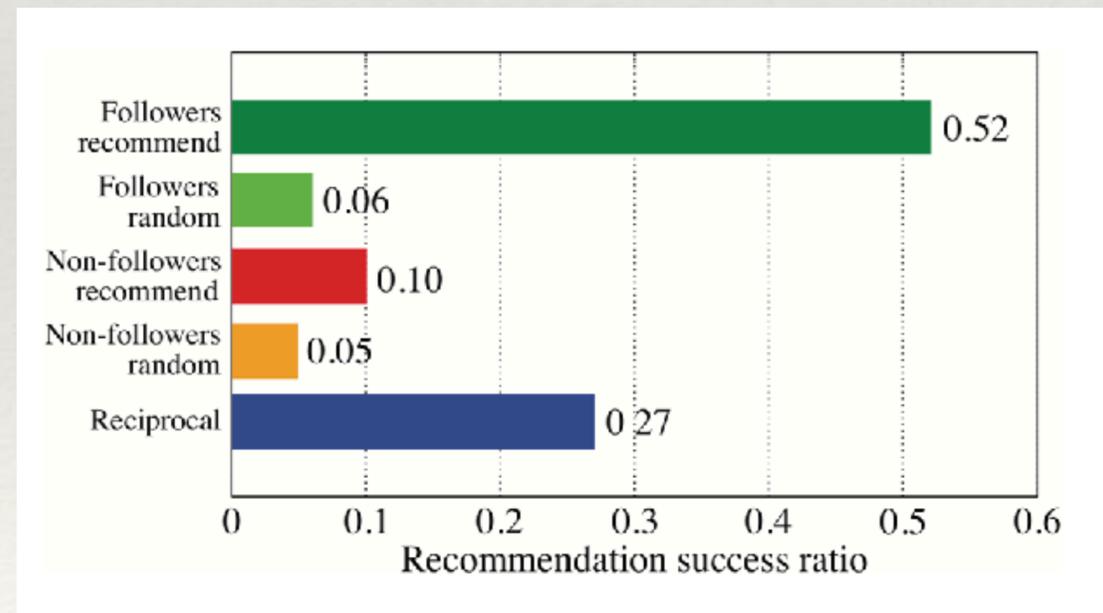
What happened to Lajello?

Lajello, incidentally, became the second most popular user in Anobii in terms of messages from distinct users

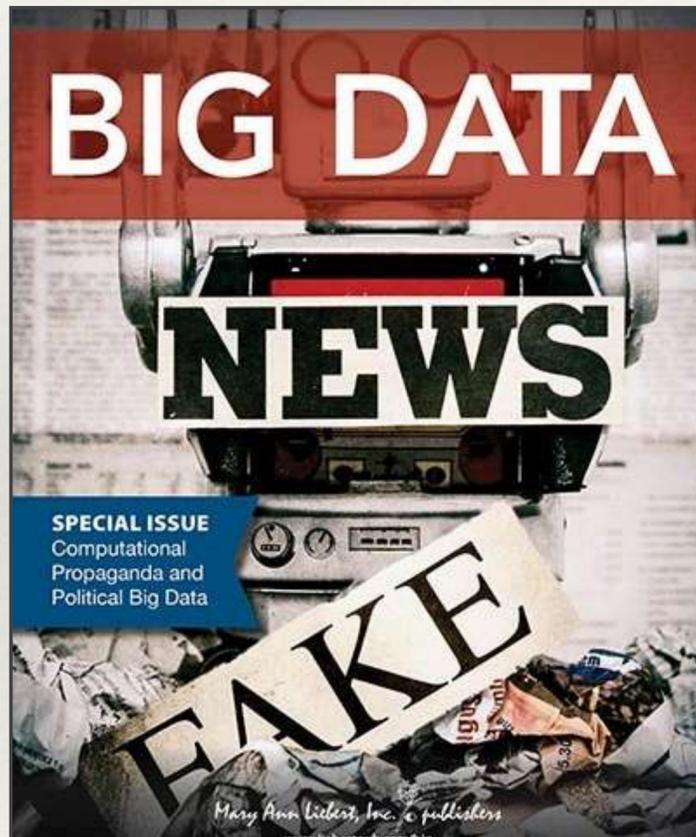


Exploiting Lajello popularity

- ❖ Lajello started to introduce users to each other according our link recommendation algorithm
- ❖ First result: users acceptance of the recommendation skyrocketed if they previously wrote in Lajello's wall



Influence of bots



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REVIEW ARTICLES

The Rise of Social Bots

By Emilio Ferrara, Onur Varol, Clayton Davis, Filippo Menczer, Alessandro Flammini

Communications of the ACM, Vol. 59 No. 7, Pages 96-104

10.1145/2818717

[Comments \(1\)](#)



nature
COMMUNICATIONS

Article | [Open Access](#) | Published: 20 November 2018

The spread of low-credibility content by social bots

Chengcheng Shao, Giovanni Luca Ciampaglia, Onur Varol, Kai-Cheng Yang, Alessandro Flammini & Filippo Menczer

Nature Communications **9**, Article number: 4787 (2018) | [Download Citation](#) ↓

Incidentally, we created an “egg war”

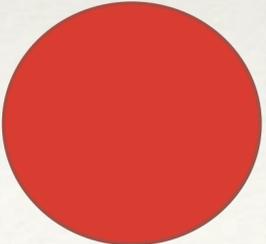
- After our initial experiment, Lajello remained silent for one year and then he “talked”. The recommendations changed the net structure and Lajello account was banned after 24 hours. This ignited a “war”
- Two polarized opinions emerged: Anobii users created immediately two thematic groups: “the (not requested) suggestions of Lajello” and “Hands-off Lajello”
- A large portion of users that were contacted by Lajello joined to one of these groups
- We observed a strong interplay between the existing relationships in the social network and the opinion that emerged from the users at the end of the links: “**echo chamber**” effect?

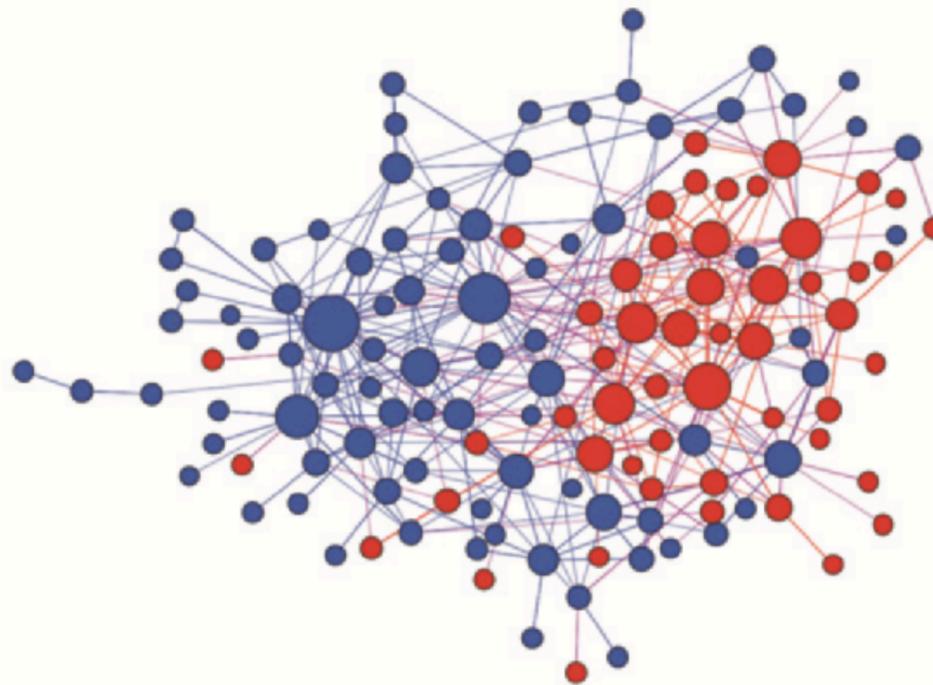
Social polarization and emotional reaction

 red dots are lajello supporters

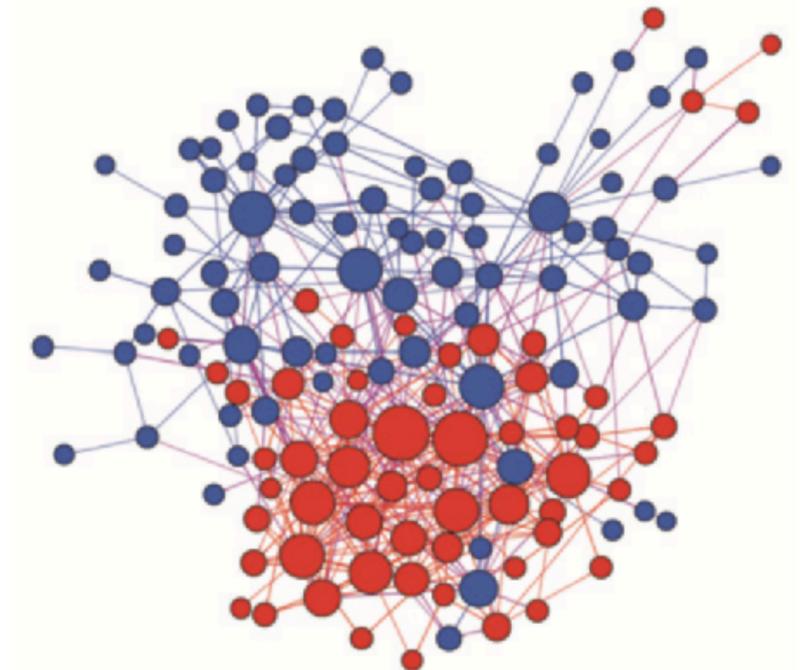
 blu dots are lajello haters

   links are existing social connections or direct messages (graph is directed)

 bigger dots are users with more links



Social Network

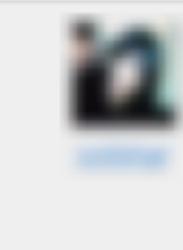


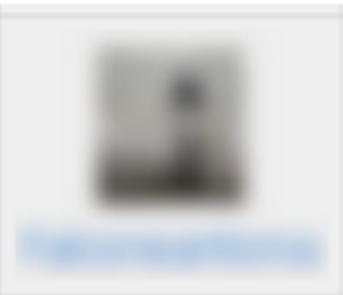
Communication Network

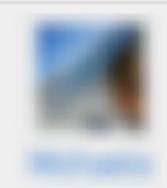
Automatic network-based [community detection](#) algorithm (OSLOM) accurately finds clusters (80% - Social network, 72% - Communication network), confirming a signal of **segregation** between the two groups before link recommendations



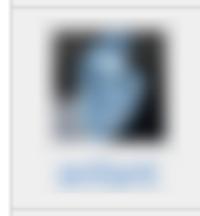
 LAJELLO... HAI STUFATO..NON SE NE PUO' PIU'...STA ATTENTO/A CHE SONO CAPACE DI ASSOLDARE UN HACKER PER VEDERE CHI SEI..E PO' SONO C...TUOI
Tre settimane fa 

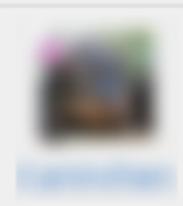
 ahahahhahahaha tu sei un genio!!!! sei davvero un genio!!! insomma ma quante visualizzazioni hai???? sei un grande!!!! riesci a farti visitare e a farti scrivere pur non avendo libri!!! ti adoro sei grandissimo :P
Aug 13, 2010 

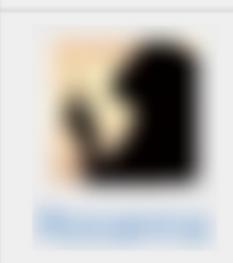
 chi sei?

 un grande.
continua così. Grazie delle visite, si vede che ti sto simpatica...
P.S: propongo di aprire un gruppo the Lajellos fans...
3 giorni fa 

 già che mi ritrovo qui mi faccio pubblicità! Venite a vedere la mia libreria è la più bella -del mondo-. (l'ultima parte andava sottolineata..)
Due set 

 chapeau!!

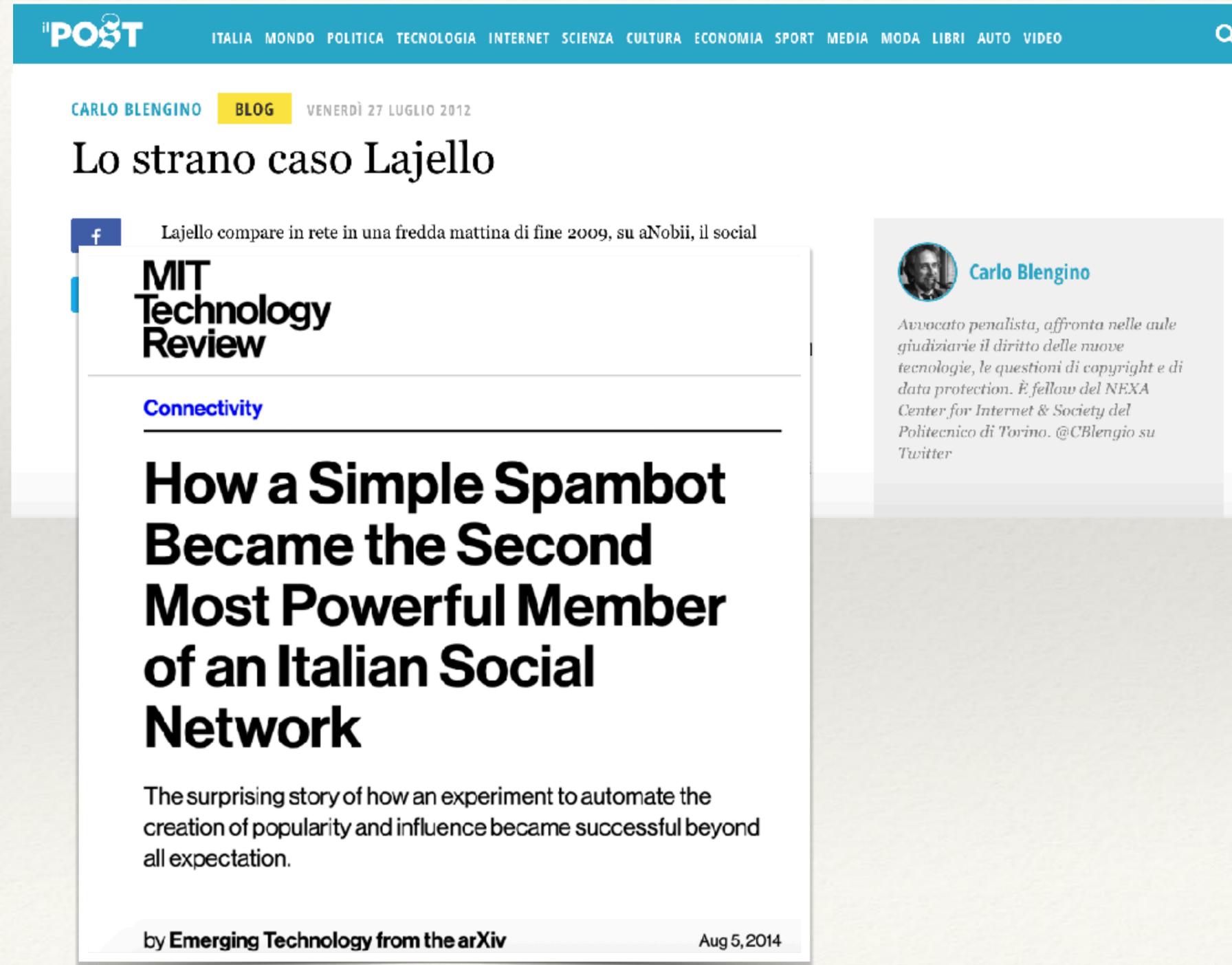
 Le tue visite cominciano ad essere inquietanti....

 ahahahaahah tu sei un genio!!

 Grazie Lajello, mi sono divertita un sacco a leggere i commenti degli altri anobiani. Sembra un esperimento di psicologia sociale, se non ti dispiace ti aggiungo come vicino! e resisti eh...non pubblicare un libro! ;)
Due settimane fa 

Lessons learned and observations

- ❖ Handle **experiments in social media** with care :)
- ❖ A simple **spambot** can take power in a social network
- ❖ A seed of **polarization** found in pre-existing network structure
- ❖ ... also the structure changed after our experiment was run!
- ❖ What if the real identity and motivations of Lajello were fact-checked?



POST ITALIA MONDO POLITICA TECNOLOGIA INTERNET SCIENZA CULTURA ECONOMIA SPORT MEDIA MODA LIBRI AUTO VIDEO

CARLO BLENGINO **BLOG** VENERDÌ 27 LUGLIO 2012

Lo strano caso Lajello

Lajello compare in rete in una fredda mattina di fine 2009, su aNobii, il social

MIT Technology Review

Connectivity

How a Simple Spambot Became the Second Most Powerful Member of an Italian Social Network

The surprising story of how an experiment to automate the creation of popularity and influence became successful beyond all expectation.

by **Emerging Technology from the arXiv** Aug 5, 2014

Carlo Blengino
Avvocato penalista, affronta nelle aule giudiziarie il diritto delle nuove tecnologie, le questioni di copyright e di data protection. È fellow del NEXA Center for Internet & Society del Politecnico di Torino. @CBlengio su Twitter