Beyond Notability. Collective deliberation on content inclusion in Wikipedia

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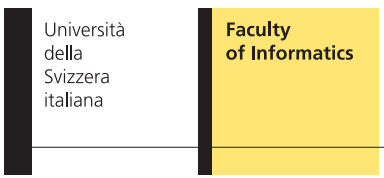


Quality in TEchno SOcial Systems,
Budapest 28 September 2010

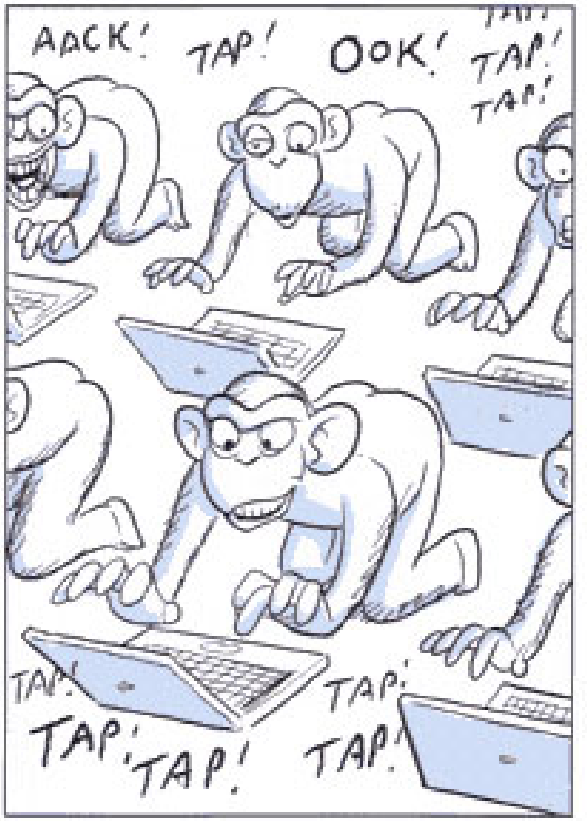
Distributed oversight in peer production systems

Commons-based peer production systems

- Open and participatory nature
- Decentralised governance
- Self-allocation of effort

(Benkler 2006)

Key to scalability = potential source of biases and suboptimal allocation of resources



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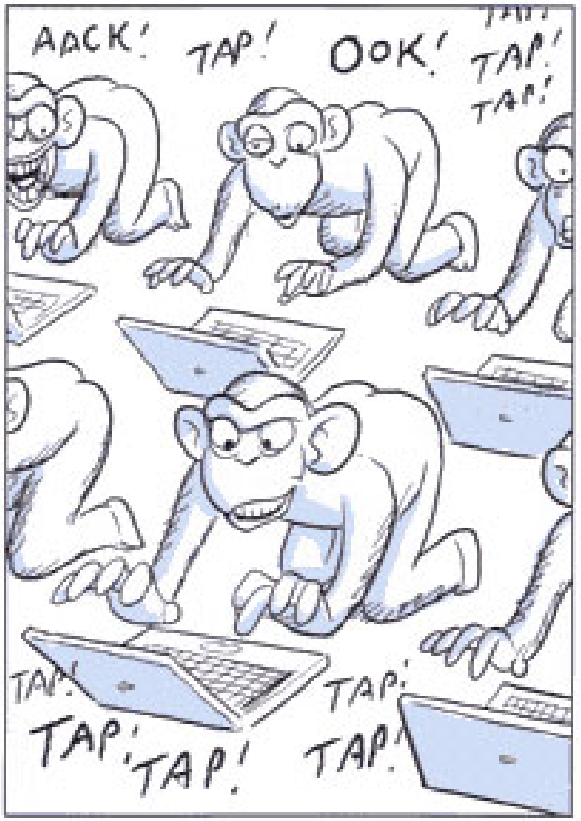

Distributed oversight in peer production systems

< 25 September

Purge server cache

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2 Juban's Restaurant
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8 List of Messianic and Hebrew Christian congregations
9 Xxoffann
10 Joseph Salama
11 Dj littlefoot
12 Pneumatic bladders
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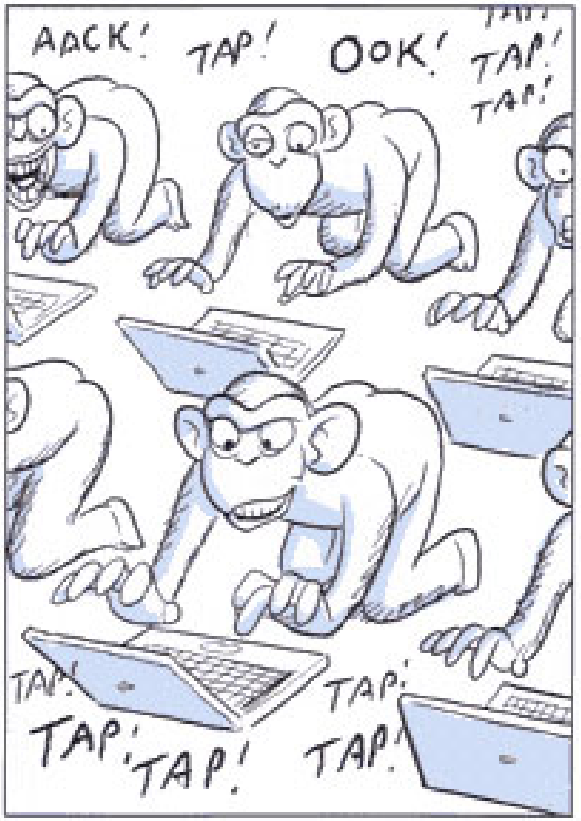
14 N.W.A. (New World Agenda)
15 Imran Channa visual artist



Distributed oversight in peer production systems

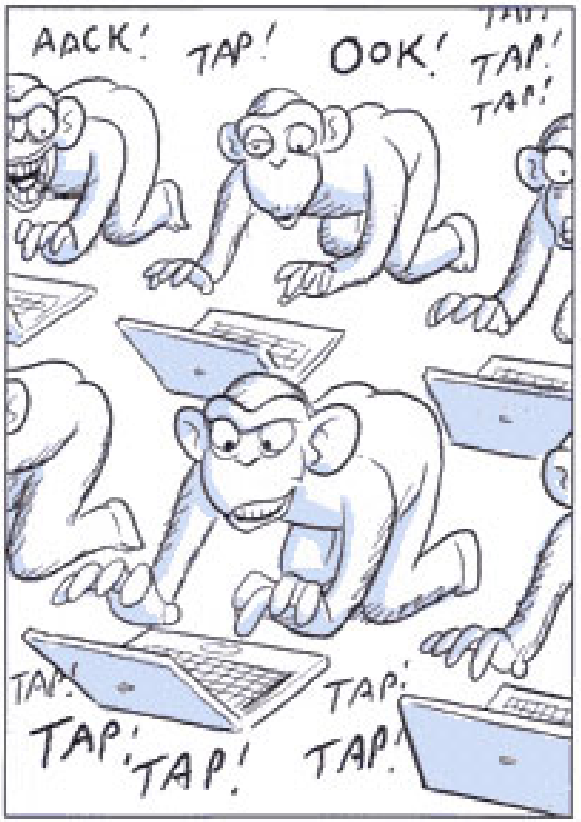
Collective deliberation on content inclusion/deletion

How to decide at a massive scale and in a timely and accurate way which topics deserve a dedicated article?

Encyclopaedic Notability assessment

“Wisdom of the crowds” approach

Expert evaluation is not applicable



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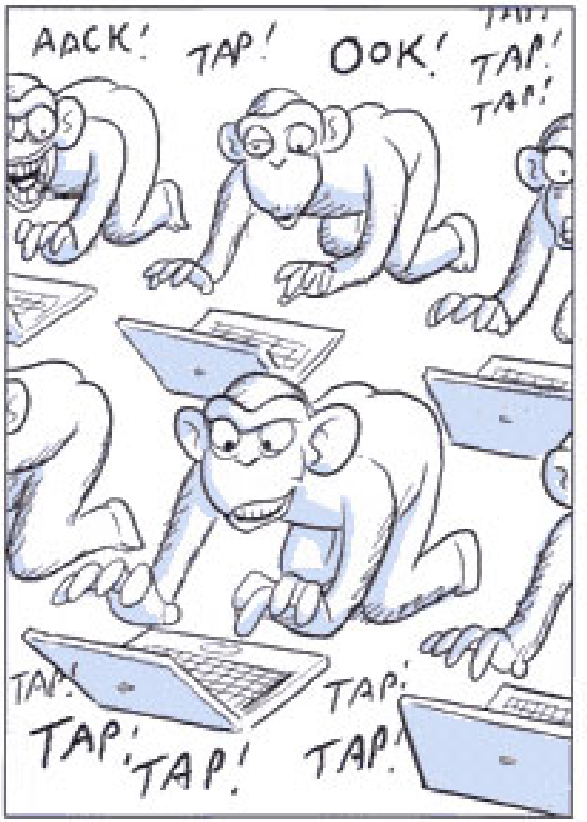

Previous work

Beschastnikh et al., 2008; Forte et al., 2009

- Progressive decentralisation
- Growing bureaucracy

Lam & Riedl 2009

- Deletion of articles happens early
- Survival probability correlates to popularity
- *Deletionism & Inclusionism*

Leskovec al., 2010

- Consensus-building in public deliberation
- Biases and limits of group decision-making

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Motivation

Objectives

- Identify potential biases of a cognitive and social nature
- Evidence to assess the design of decentralised deliberation systems

Outline

1. Mechanics of deletion procedures
2. Research questions
3. Dataset
4. Results
5. Discussion

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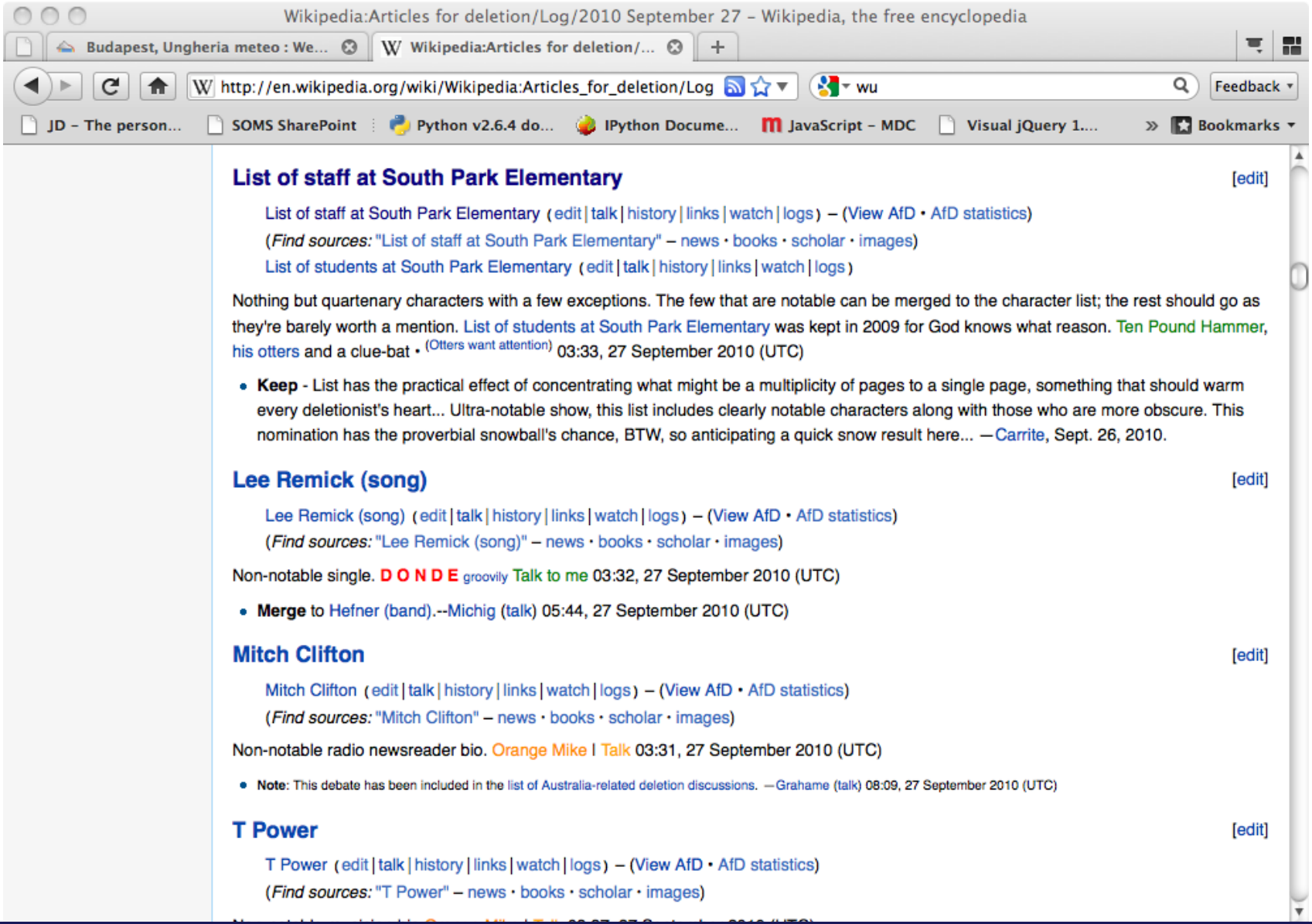
What do AfD discussions look like?



The mechanics of AfD discussions

Deletion process

Nomination $\Rightarrow$ AfD discussion $\Rightarrow$ Assessment (no headcount)

Vote options

- **Delete** (*D*)
- **Keep** (*K*)
- **Merge** (*M*)
- **Redirect** (*R*)

The mechanics of AfD discussions

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Research questions

Conditions for unbiased AfD discussions

- topic notability judged *on its own merit*
- voters know *and* comply with guidelines and policies
- voters are not influenced by votes previously cast
- voters are not driven by strategic reasons

Research questions

Biases: beyond sheer notability assessment

1. **Herding effects.** Is there evidence of informational cascades, suggesting that individual choices are affected by previously cast votes?
2. **Heterogeneity of participant behaviour.** Are voters homogeneous in their voting behaviour or are there tendencies that systematically differentiate how they vote?
3. **Strategic behaviour.** What is the dynamics of AfD discussions, if voter behaviour is affected by highly polarised factions?

Dataset

Data collected via the Wikipedia API

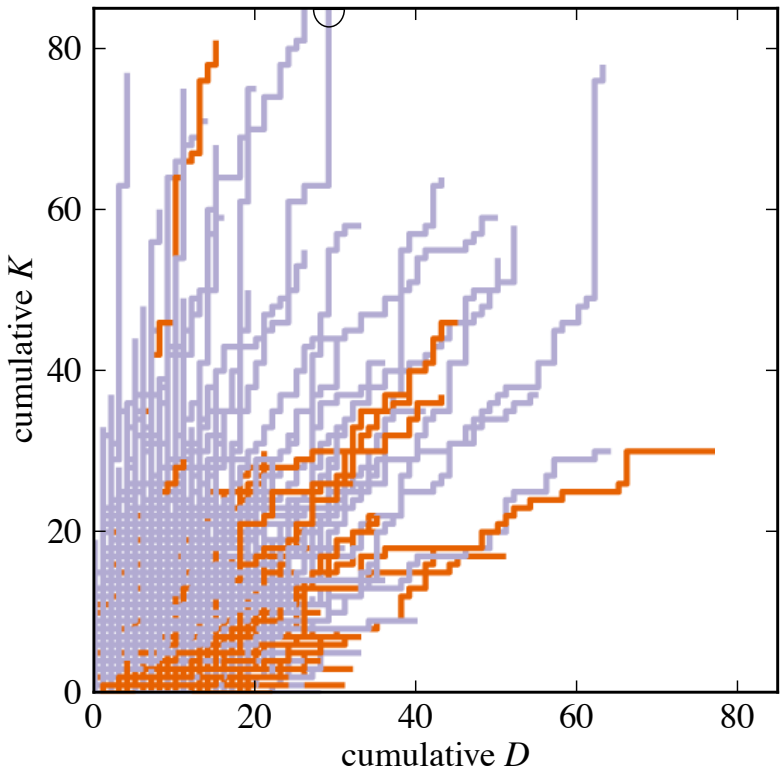
- 223,209 AfD discussions over 7 years (January 2003 to July 2010)
- 1,218,267 unique votes cast by 68,998 individual users.
- dataset includes, for each vote, the title of the corresponding AfD, the user name of the voter and the option voted (no text comments).
- 8,361 anonymous users (12.1%) identified only by the IP address and are responsible for 11,931 votes.

o	D	K	M	R
f_o	0.6837	0.2543	0.0415	0.0204

Guidelines compliance: Trajectories and outcome

Cumulative number of *K* and *D* at any given step of an AfD sequence.

Colour codes the outcome. Orange: AfD that resulted in the page being deleted; Purple: page kept, redirected or merged. The circle indicates one AfD sequence that ends off the plot.



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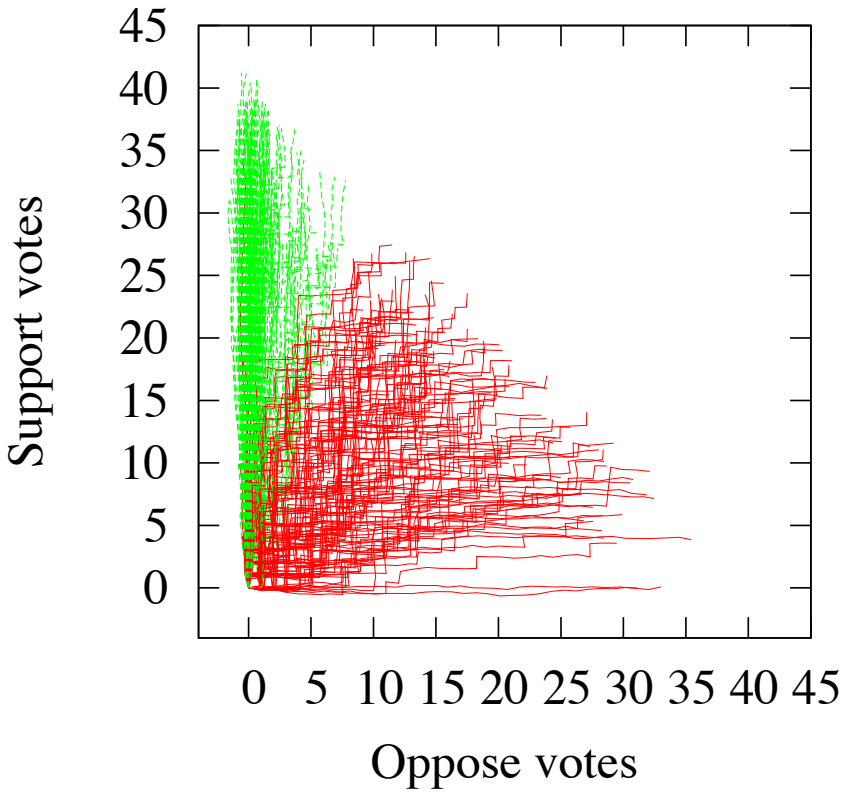
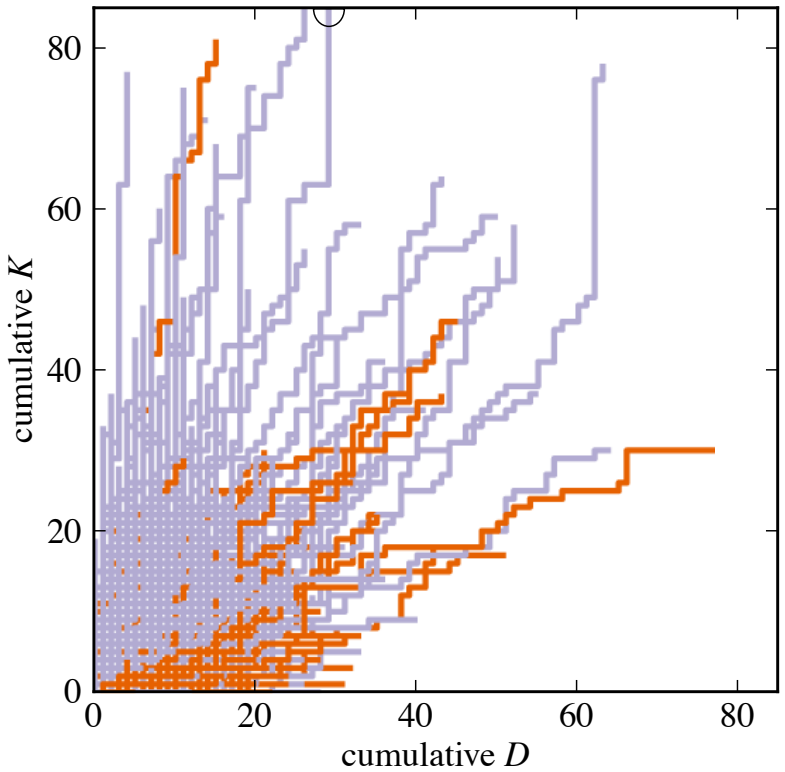




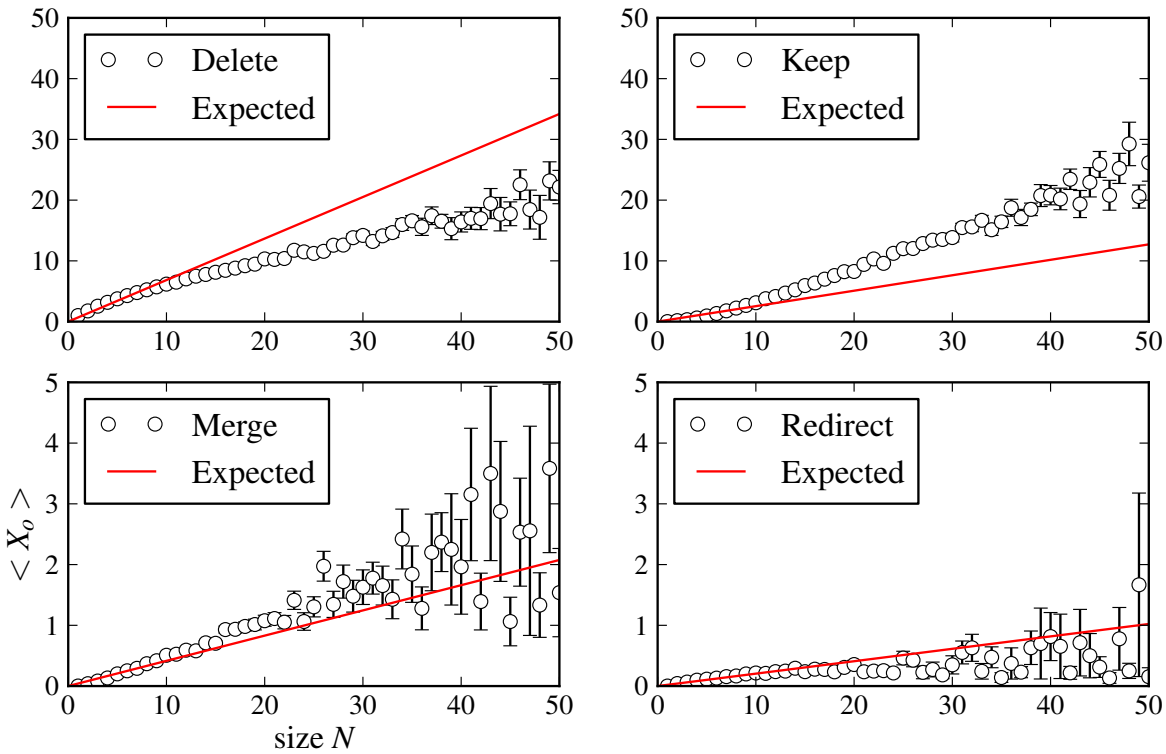
Leskovec al., 2010

Individual biases: Herding effects

IID model of a voter: chooses option o with prob. f_o

$X_o(N) =$ number of votes accrued by option o after N trials.

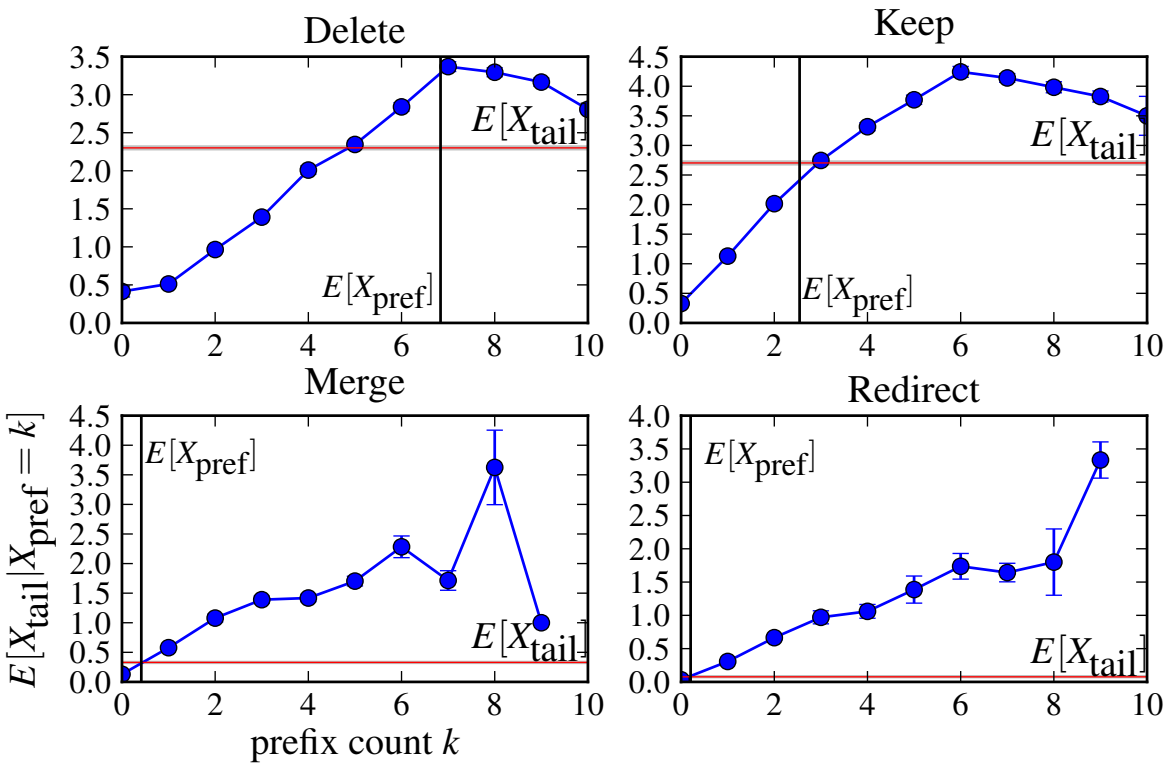
$< X_o(N) >= Nf_o$. There is agreement until $N = 10$.



Individual biases: Herding effects

Are participants in an AfD discussion influenced by the level of consensus they perceive at the time in which they join a vote?

$V_i \in \{K, D, M, R\}$, split voting sequence $V_1, V_2, \ldots, V_n, V_{n+1}, \ldots$ in two: *prefix*: $V_1, \ldots, V_n$ and *tail*: $V_{n+1}, V_{n+2}, \ldots$. $X_{\text{pref}}, X_{\text{tail}}$ = number of votes. (here: $n = 10$)

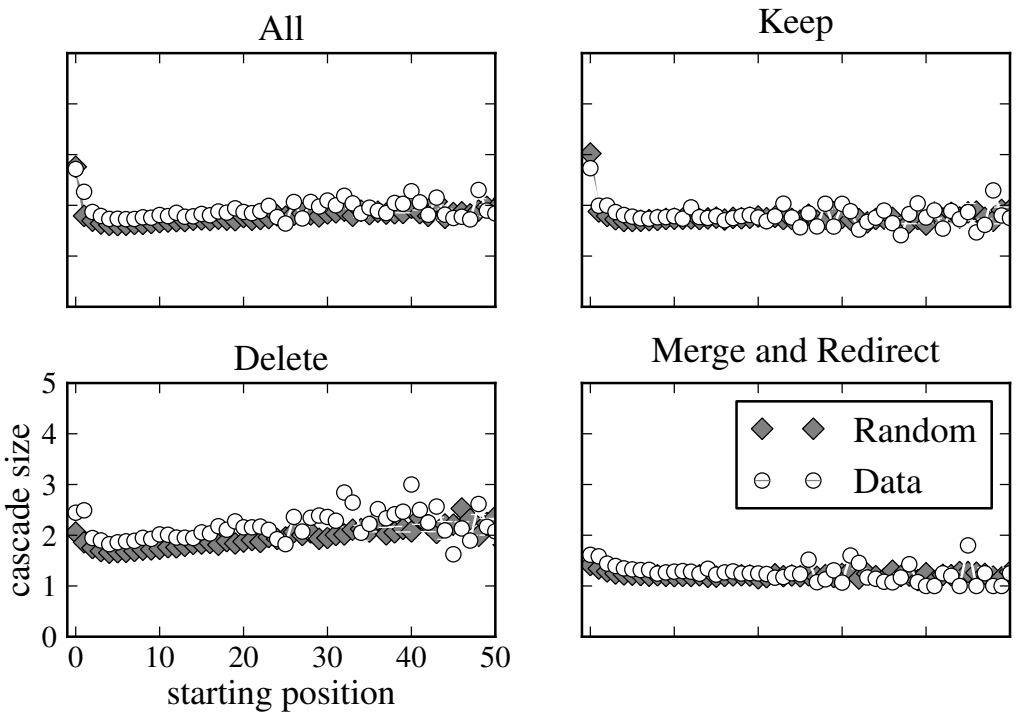


Individual biases: Herding effects

Are cascades of votes more likely to occur at a specific position in the voting sequence?

Plots: cascade size as a function of position in voting sequence.

No privileged position where cascades happen (almost flat curves), trend similar to randomly reshuffled sequences

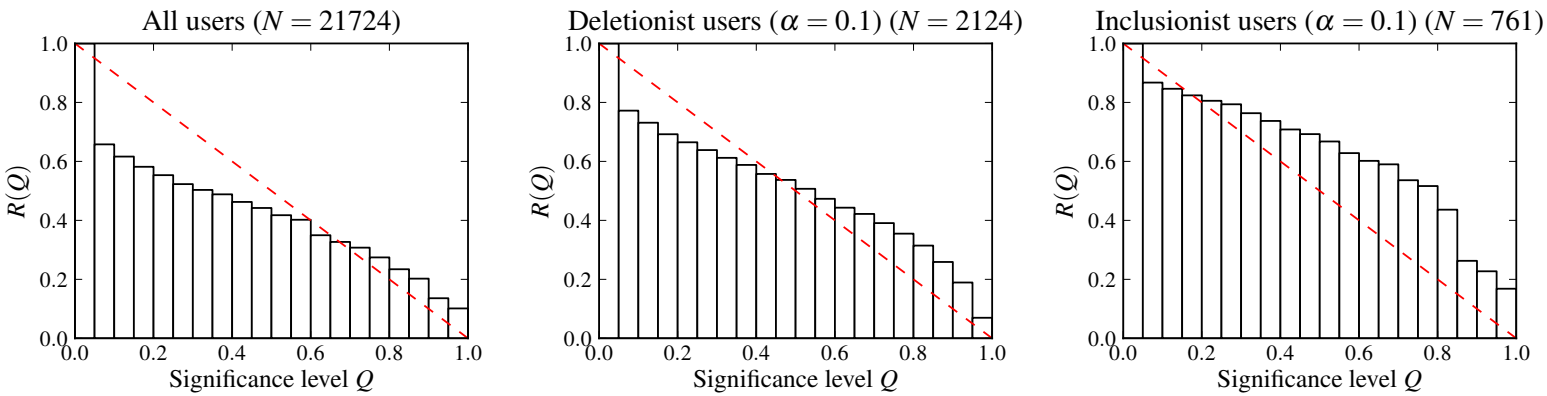


Heterogeneity of User behavior

Are there asymmetries in voting behavior at the individual level that may indicate distinct classes of users?

Test whether baseline distribuon $P(o) = f_o$ reliably represents individual users. Plot compl. CDF of χ^2 p-values between observed user's u voting frequencies $P(o, u)$ and baseline $P(o)$.

"inclusionist" users: $\{\text{all users } u \text{ s.t. } P(K, u) > P(D, u) + \alpha\}$
(and similarly for "deletionist")



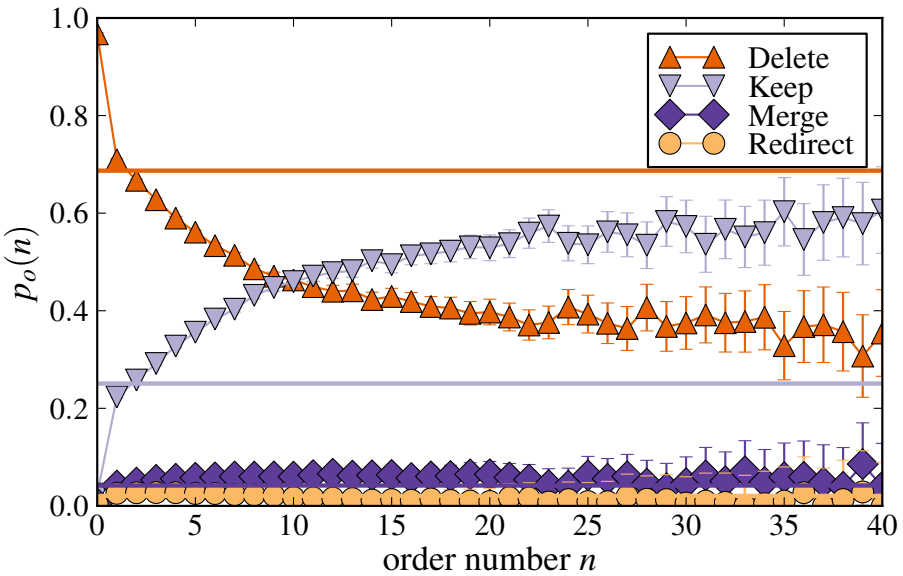
Social biases: Strategic Behaviour

Probability $p_o(n)$ of voting for a given option o after $(n-1)$ votes have been already cast.

Strong non-stationarity in the case of K and D.

Higher probability to cast a D in the initial part of the sequence,rapidly decreasing after the first 10 votes, until it balances with that for voting K.

Users being clustered in their voting behaviour $\Rightarrow$ "factions" do have an influence in AfD dynamics.



Directions

Key empirical questions

- What drives **participation** to collaborative decision-making
- What drives actual **choice** once a decision to participate is made
- What are the **emergent effects** of individual decisions at a macroscopic level

$\Rightarrow$ Appropriate **incentive structure** for these systems to be accurate, timely, and cost-effective

Directions

Reverse-engineering user psychology in collaborative settings

- **Herding**
  Predisposition to vote as a function of order and type of previous votes
  Social impenetrability

- **Strategic behaviour**
  Predisposition to vote under recruitment
  Cognitive impenetrability

$\Rightarrow$ Design robust systems against individual and social biases

Thanks

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Reference

D. Taraborelli, G.L. Ciampaglia, Beyond notability. Collective deliberation on content inclusion in Wikipedia. *Fourth IEEE International Conference on Self-Adaptive and Self-Organizing Systems Workshops* (SASOW 2010), Budapest, September 27- October 1, 2010.

http://nitens.org/docs/qteso10.pdf