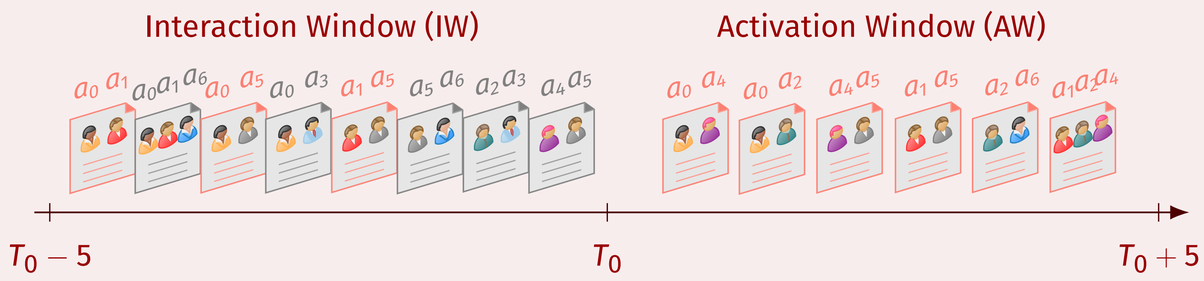
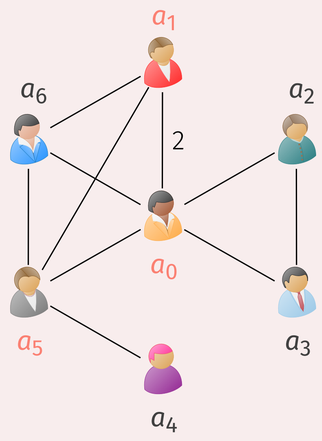
Social Contagion in Science

Sara Venturini[1*] Satyaki Sikdar[2*] Francesco Rinaldi[1] Francesco Tudisco[3] Santo Fortunato[2]

[1]University of Padova [2]Indiana University [3]Gran Sasso Science Institute





Collaboration network G
Active authors $A = \{a_0, a_1, a_5\}$

Introduction

Collaboration is a rich source of information about the behavior of scholars. We can infer how they choose future research directions via the intertwined mechanisms of selection and social influence.

Topic Switch

The act of a scholar a to start working on a new topic t

Collaboration Network Construction

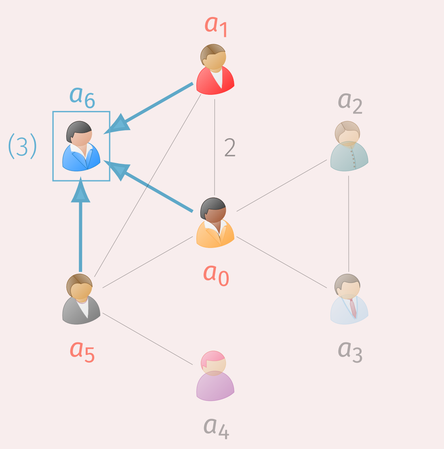
1. Select a topic t, start year T_0, and construct Interaction (IW) and Activation Windows (AW)
2. Identify *active* authors A who publish on topic t during the IW $[T_0 - 5, T_0)$
3. Build collaboration network G using papers written by A during the IW

Membership Closure

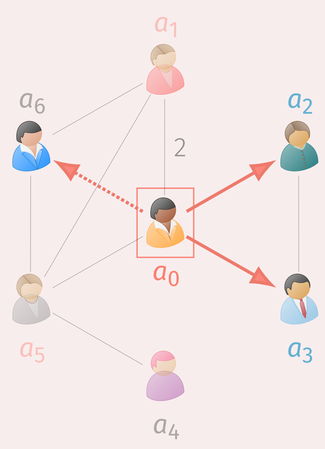
Probability of an inactive author a performing a **topic switch** during the AW as a function of contacts with active authors in the IW

Target Activation Probability

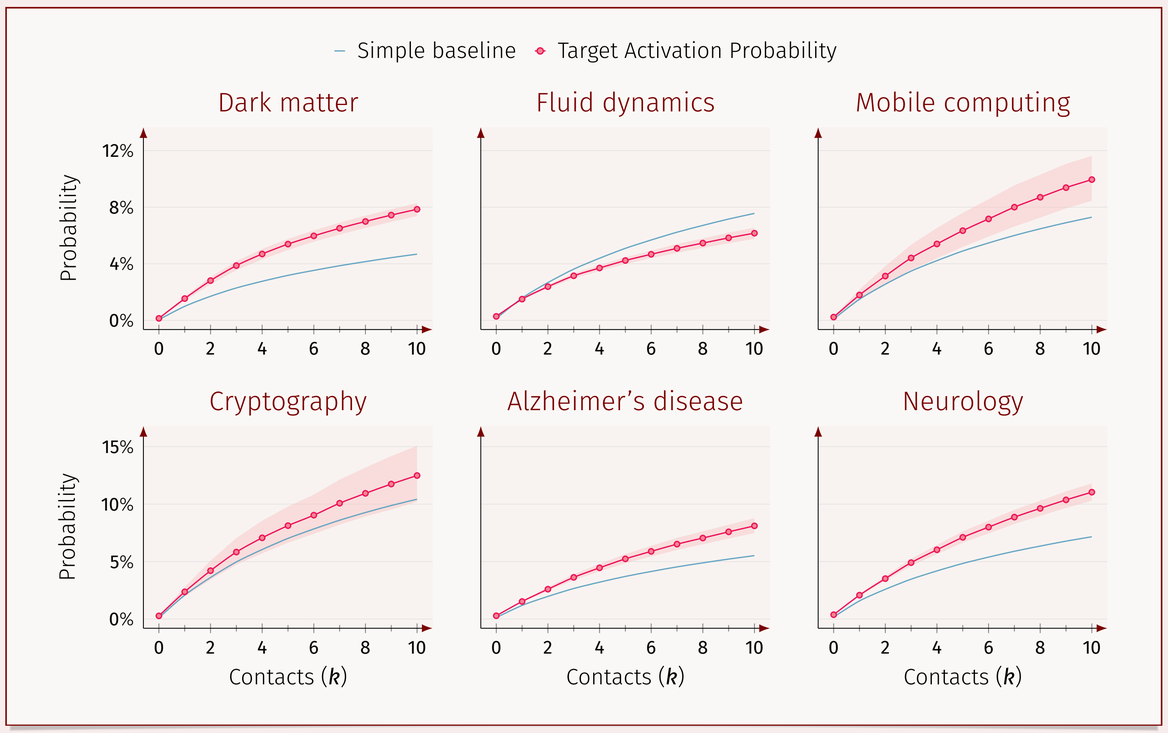
Fraction of inactive authors who undergo a topic switch in the AW as a function of contacts with active authors in the IW

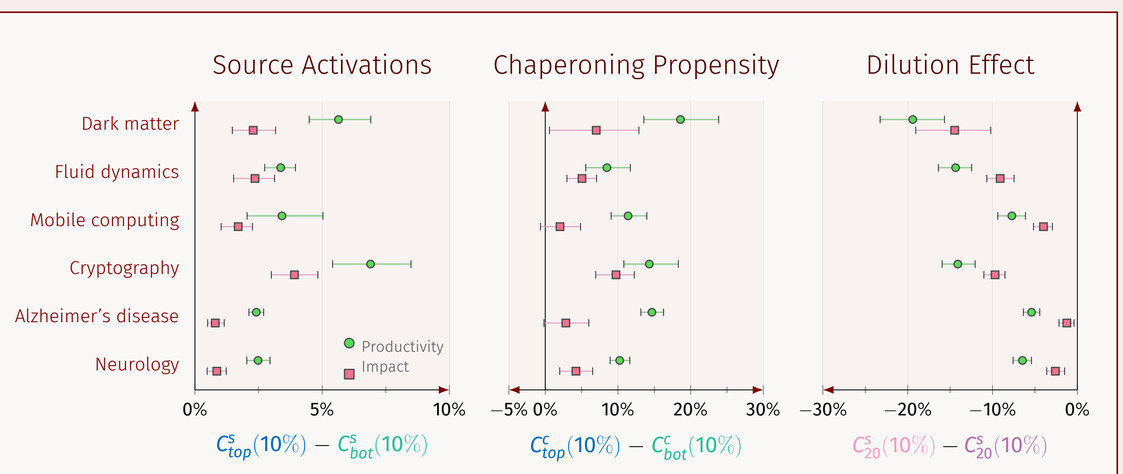


(a) Inactive author a_6 has 3 contacts



(b) Active author a_0 has 2 exclusive inactive coauthors: a_2 and a_3





Source Activation Probability

Fraction of a's **exclusive** inactive coauthors who become active in AW

Chaperoning Propensity

Fraction of a's exclusive inactive coauthors who become active in AW and write their **first paper** on t with a

Dilution Effect

Difference between source activation probabilities of the top and bottom 20% of most **collaborative** authors within the top 10% active authors

Key Takeaways

- Increased contacts with **active** authors are strongly correlated with higher topic switching rates
- **Prominent** authors are more likely to induce topic switches on inactive coauthors
- The average number of coauthors per paper is **inversely** related to the topic switch probability

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