Context of burstiness in Facebook activities

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Introduction

- Despite the natural circadian cycle of human activities the dynamics of several human actions have been found to present bursty temporal patterns
- **Explanation 1**: bursts in human dynamics appear due to the alternation of active and inactive periods, driven by circadian fluctuations, but otherwise induced by independent events
- **Explanation 2**: bursts emerge as a consequence of the entangled effects of prioritising of many different tasks leading to intrinsic correlations between consecutive actions due to conscious decisions of an individual

Data and methods

- Our study uses a novel joint data source of combined Facebook and survey data
- Respondents were asked to log-in to FB on the interviewers' notebook and to download their FB profile archive
- 150 respondents took part in our study
- Participants signed consent form
- The data covers a wide range of Facebook activities: posts, comments, likes and reactions, pages, friends, profile, and ads data
- As each activity in the archive has a timestamp, the data provides an opportunity for dynamical temporal analysis

Results

- The online activities of the observed users were found very bursty, indicated by the broad distribution of inter-event time (see Fig.1a) measured between consecutive user actions (any type)
- The presence of long event trains provide evidence that pairs of bursty events are not independent as their sizes are broadly distributed
- They appear with a significantly longer tail than an exponential distribution, which is the expected behaviour for independent event pairs obtained after shuffling the inter-event times
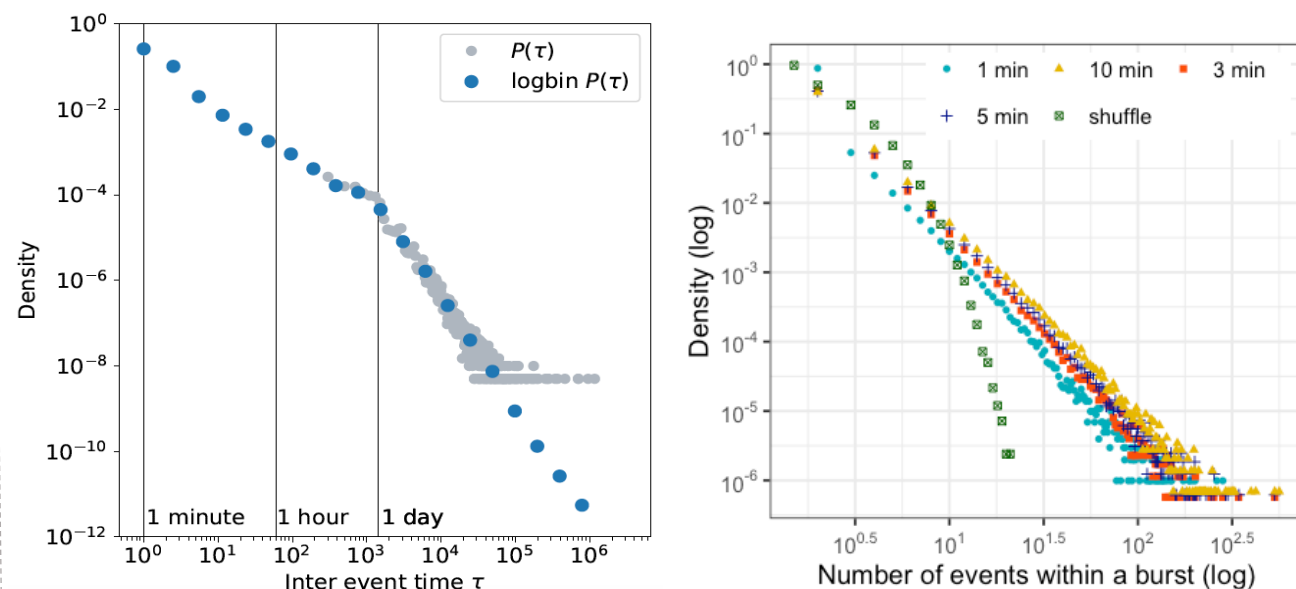
Figure 1. Characterising bursty Facebook activities. (a) Inter-event time distribution. (b) Bursty train size distribution with different Δt time windows and in case of random shuffling (green).

- After categorizing all activities as reacting on friends, reacting on pages, page following and other activities (like posting, or sharing) we found a strong intercorrelation between same event types (see table 1).
- This intercorrelation is stronger within those users who are more active
- This further demonstrates that bursty trains are induced by correlated events of the same type of activity.
- Our results promise a more detailed understanding about the decision mechanism behind the bursty phenomenology.

		Event (t+1)			
		Page following	Reaction on friend	Reaction on a page	Other activities
Event (t)	Page following	**25,07**	0,31	1,81	1,00
	Reaction on friend	0,33	**1,49**	0,61	0,38
	Reaction on a page	3,41	0,59	**11,20**	0,60
	Other activities	0,38	0,33	0,33	**6,71**

Table 1. Ratio of observed transition probability to the ratio of random transition probability