

Project proposal

Investigating the dynamics of human online interactions

Main objective

Recent studies have shown that human communication can be characterized by a feature called burstiness, i.e. short periods of high activity followed by long periods of low activity[1][3]. Bursty nature of human dynamics indicates temporal inhomogeneities that could arise due to the rhythms of daily life (e.g. the circadian rhythm) or deliberate human activity (e.g. assigning priorities)[2]. In this project, we aim to examine the dynamics of human messaging behaviour by using anonymized Facebook and WhatsApp data. **This is a self-contained project and can be done either as a study project or extended to a thesis.**

Why this project?

- Bursty dynamics has been shown in human data from multiple sources, including mobile and email communication. A replication of these findings would add to the evidence that burstiness is a universal feature of human communication, independent of the medium. In turn, if data from multiple sources illustrate the same dynamics, the validity of these data to study human behavior would be higher.
- Metrics of burstiness can be used as additional features to characterize and quantify social interactions. In this manner, the metrics from this project could be integrated into our larger project, in which we try to identify features and patterns of social interactions that are associated with certain psychological traits.

Project requirements

- Working knowledge of Python and data visualization

References

- [1] Barabási, Albert-László. "The Origin of Bursts and Heavy Tails in Human Dynamics." *Nature* 435, no. 7039 (May 2005): 207–11. <https://doi.org/10.1038/nature03459>.
- [2] Jo, Hang-Hyun, M. Karsai, J. Kert'esz, and K. Kaski. "Circadian Pattern and Burstiness in Mobile Phone Communication," 2012. <https://doi.org/10.1088/1367-2630/14/1/013055>.
- [3] Wu, Ye, Changsong Zhou, Jinghua Xiao, J. Kurths, and H. Schellnhuber. "Evidence for a Bimodal Distribution in Human Communication." *Proceedings of the National Academy of Sciences*, 2010. <https://doi.org/10.1073/pnas.1013140107>.

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