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# Complexity on mentions-based Twitter networks during electoral processes

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## Introduction

In this work we built an evolving network from Twitter mentions between users during the 2017 Chilean presidential electoral process, but instead of trying obtain a forecast of the election outcome we analyze the structure and topology of the network. To address this, we study the degree distribution and betweenness centrality of the network over time.

We built a time-evolving network from all tweets issued by each of the presidential candidates' accounts mentioning or replying another user, and all tweets mentioning or replying such accounts, in a period of about 3 months (since the beginning of the electoral campaign until a week past the second-round election). The over-time analysis was done by making small networks, that we called *frames*, which contain the tweets of 7 consecutive days, and considering a one-day displacement between consecutive frames. Thus, we had a *sequence* of "7 days" networks. Every *frame* network was built considering each Twitter account as a node and each pair of nodes (Twitter accounts) were connected if there were tweets from one of them mentioning the other, and storing the number of these tweets as the connection weight.

We found every *frame* network had a *scale-free* behavior, i.e. their degree distributions were described by a power-law for higher degrees. The distributions of betweenness centrality were also described by a power-law and then we computed the exponent $\gamma$ and $\eta$ of each distribution, respectively, over time. We were able to recover relationships from previous works [1] between these exponents.

In a later analysis we attacked the network by removing nodes. Indeed, we removed all the presidential candidates nodes and re-computed the critical exponents and got a very similar trend to the one we had obtained before. This suggest the built network is robust and the fluctuations on the critical exponent $\gamma$ may not even be related with the presidential candidates Twitter activity. We also think a peak on the critical exponent $\gamma$ (that occurs since later October to early November) may be due to the public release of the CADEM poll results.

## References

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