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Long Term Evolution of Email Communication Network

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Advisors : Dr. Roger Guimerà and Dr. Marta Sales-Pardo

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Techno-social system: the combination between technology and social interactions



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Current Methods focus on Short Term Dynamics



Kossinets, Gueorgi and Kleinberg, Jon and Watts, Duncan. KDD '08 (2008)

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What about long term Evolution(on a yearly basis)?

Definition of the network which lead to the Evolution





To study the **Evolution of the network** we calculate which is called the **annual logarithmic growth rate (LGR)** of each link.

$$g_{ij}^{\omega} = \log\left(\frac{\omega_{ij}(t+1)}{\omega_{ij}(t)}\right)$$





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The **Fit is a convolution** of a not centered **Exponential distributions and a gaussian distribution**.

 $\sigma_{exp} \simeq 0,4 \quad \sigma_{gauss} \simeq 0,1 \quad x_0 \simeq 0,08$

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weights LGR

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Gini Coefficient is measure of how equally is distributed the information (email) over each user's contacts.





G=0 Equally distributed







Thank you!

Roger Guimera, Marta Sales-Pardo, Antoni Aguilar, Francesco Massucci, Arnau Galvalda, Antonia Godoy, Toni Vallès, Oriol Senan, Marc Tarrés, Manuel Miranda







DE ECONOMÍA



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