Romanian Scientific Diaspora Symposium

Challenges of the social media: Information diffusion in social networks

Marian-Andrei Rizoiu



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What is NICTA?

- Australia's National Centre of Excellence in Information and Communication Technology
- NICTA's objectives: Research Excellence in ICT and Wealth Creation for Australia
- Skills and Capacity: 700 staff including 270 PhD students, ~600 research papers/year, > 150 patents total, 15 spin-offs
- Impact: > \$3B direct impact on GDP from projects



Bionic Eye





BusPlus project

NICTA: Research and Wealth Creation



The Human Dynamics Project

Intersection of the computer and social sciences

Primary interest: social and financial networks, crowdsourcing, urban economics, behavioral game theory, and evolutionary dynamics.

Research focus: Social networks in disasters, Information propagation in social networks, Social mobilization and crowdsourcing







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The Team



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Marian-Andrei Rizoiu Information diffusion in social networks

Information diffusion?





Information diffusion in social networks

Online Social Network?





An application - Evolution of popularity of online videos

What drives popularity?

Is it predictable?



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Diffusion in the underlying network?



with video 'iS1g8G_njx8'



Ariana Grande - Problem ft. Iggy Azalea

A theoretical generative model

- Inspired from earthquake simulation models a Hawkes selfexciting generative process;
- Each event (*i.e.*, earthquake, youtube view, tweet) generates, with a time-decreasing probability, new events;
- Allows the prediction of the future activity, based on past activity.







Data at the intersection of 2 social networks





Dataset statistics:

- 6 months;
- 1.061B tweets;
- 64.3M users;
- 81.9M Youtube videos.

Real-world application

So is popularity predictable?

Hint: not really, but we can identify individuals susceptible of being popular



Choosing what to promote

- Given 2 options, which one should be promoted?
- How much promotion does it require?

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Map of virality susceptibility

175 videos pop. perc. (color) and exo. impulse s(t) (diameter) w.r.t endogenous response and exogenous sensibility



Other applications

> Quantify reaction to external stimuli;

- Estimate the effect of marketing campaigns;
- > Understanding types of videos.

But also

Understand which parts of the social network diffuses better different types of information \rightarrow the informational conductibility of the network.

Thank you!

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Understand which parts of the social network diffuses better different types of information \rightarrow the informational conductibility of the network.