Human Behaviour on the Web: Evolution, Interactions and Exploitation

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ABSTRACT

The Web has a fundamental impact on our life, and its usage is quite dynamic and heterogeneous. Moreover, the Web, and in particular Online Social Networks allow people to communicate directly with the public, bypassing filters of traditional medias. Among the others, politicians and companies are exploiting this technologies to widen their influence. In the talk I will show techniques to capture such usage evolution and analyze people interaction on the Internet. This information allows us to understand how users and web services change over time, and how someone can take advantage of these behaviours.

There is a large literature about how to evaluate and influence a social network from an analytic point of view [7]. However, it is often not clear if the hypotheses in the mathematical models are valid in real cases and rarely there is enough ground-truth information in large scale experiments. In practice, we observe in the networks heuristic strategies following a trial-and-error approach and emerging behaviours. This is why I am focusing on capturing the human behaviour, directly measured in the present (and past) Web.

Thanks to logs of users' traffic, and by active crawling Online Social Networks, I show how to reconstruct users' online activity and to model their behaviour, thanks also to Machine Learning approaches. We deeply understand the evolution of time spent of the Web by the users and the shifting from static pages to the usage of dynamic user-created pages and content in social networks ([4, 6, 9]). The peculiar social networks and other categories usage and evolution can be seen in [1, 4]. Still, considering a short horizon, usage is repetitive and this can exploited for identifying users even when they are not logged (behavioural fingerprints, [8]). Data from human behaviour can be used for extracting and processing social information, sometimes even without the explicit cooperation of the users, to provide new collaborative services. For example, a new service could be the recommendation of hot news that are obtained from aggregated clicks of entire communities (WeBrowse tool, proposed in [3]).

Emerging behaviours of the users can also be exploited for expanding someone's influence. A clear example is the recent political debate in Instagram [5] or in WhatsApp [2]. Results suggest that profiles of politicians are able attract markedly different interactions. Moreover, a small group of very active followers can influence a large portion of the network.

CCS CONCEPTS

• **Networks** → **Online social networks**; *Social media networks*; Network dynamics; • **Social and professional topics** → *Political speech.*

KEYWORDS

User behaviour; Online social networks; Politics; Network monitoring; Influence; Network dynamics

BIOGRAPHY

Currently assistant professor at Politecnico di Torino, he holds a Ph.D. in Electronics and Communication Engineering and a M.Sc. in Mathematical Engineering. In the recent past, he was hosted and worked for Bell Labs, MIT, UFMG, EPFL and GE Aviation. His current work is focused on studying the behaviour of the people both on the internet and in mobility, with focus on two complementary aspects: (i) data analytics, and (ii) user modelling. He is interested in many fields of data science, from big data problems to the usage of statistical, machine learning and data mining approaches. He is expert in creating analytic and data-driven models of real phenomena and optimizing performances in different scenarios. More details are available on https://www.telematica.polito.it/member/luca-vassio/

ACKNOWLEDGMENTS

This work was funded in part by the SmartData@Polito center for Big Data technologies.

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