Limited individual attention and virality of low-quality information in online social networks

Diego Fregolent Mendes De Oliveira[1]

[1]University Of North Dakota, Grand Forks, United States

The advent of online social networks as major communication platforms for the exchange of information and opinions is having a significant impact on our lives by facilitating the sharing of ideas. Through networks such as Twitter and Facebook, users are exposed daily to a large number of transmissible pieces of information that compete to attain success. Such information flows have increasingly consequential implications for politics and policy, making the questions of discrimination and diversity more important in today's online information networks than ever before. However, while one would expect the best ideas to prevail, empirical evidence suggests that high-quality information has no competitive advantage. We investigate this puzzling lack of discriminative power through an agent-based model that incorporates behavioral limitations in managing a heavy flow of information and measures the relationship between the quality of an idea and its likelihood to become prevalent at the system level. We show that both information overload and limited attention contribute to a degradation in the system's discriminative power. A good tradeoff between discriminative power and diversity of information is possible according to the model. However, calibration with empirical data characterizing information load and finite attention in real social media reveals a weak correlation between quality and popularity of information. In these realistic conditions, the model provides an interpretation for the high volume of viral misinformation we observe online.