Socio-Semantic Bubbles of Internet Communities

Results in Brief

Is the idea of online echo chambers, itself only an echo?

In an era often described as polarised, we need to understand how online debates fragment from pluralistic forums to more cocooned configurations.

DIGITAL ECONOMY

© khosrork/stock.adobe.com

A media echo chamber is a phrase often used to describe online spaces where people only encounter similarly minded others; where reading, commenting on and reposting content, reinforces the prevailing opinions.

Camille Roth, coordinator of the SOCSEMICS project, which was funded by the European Research Council, suggests the term 'socio-semantic clusters' (cohesive in social network patterns and semantic properties) to denote online groups of shared interests.

SOCSEMICS wanted to investigate the seeming growing consensus for the existence of online echo chambers.

"We still don't really know how factors like type of network link – for instance retweets versus comments, or different topics – influence the emergence or maintenance of 'socio-semantic clusters'," says Roth.

Characterising online interactions and information

SOCSEMICS concentrated on the social media platforms: Twitter (now X) and Reddit.

Twitter's API (open to academics during the research) enabled transient interactions to be captured and clusters of like-minded individuals to be characterised.

Roth focused on the 2019 European Parliament elections using specific hashtags to identify and observe clusters (and members) over 2 years, resulting in a cohort of 70 000 users communicating in French, German, Italian and English. Roth also analysed clusters interested in impact investing, using a unique, trackable hashtag (#impactinvesting) to follow a cluster of 16 000 users over 15 years.

Reddit already functions as groups clustered around discussion topics, so fragmented world views can be described. Reddit also characterised groups of claims, as linguistic patterns that represent world views, and groups of 'subreddits' (topic-based groups) already sharing similar world views.

SOCSEMICS observed how the news sources mobilised by subreddit users (particular newspapers, for instance) can reflect world views, as do groups of subreddits clustered around specific topics, with the possibility that the former may align with the latter.

SOCSEMICS used both off-the-shelf open-source tools, alongside their own, to study the configuration and interactions of networks, alongside engagement content. Models were created representing the socio-semantic clusters, with individual users the nodes, and links their interactions or affiliations, themselves connected to semantic nodes (topics, opinions, beliefs, etc.).

To characterise these semantic nodes, 'graphbrain' was developed, a linguistic tool comprising an open-source python library using semantic hypergraphs to attribute opinions to users, based on their textual content.

"We developed a hypergraph tool that goes beyond identifying key words and actually extracts opinions based on an extremely low number of linguistic patterns in sentences, rather than simple terms," explains Roth.

Perhaps the most significant project finding was that much evidence of the existence of echo chambers among online socio-semantic clusters, could simply be tautological.

"If you only trace affiliation links (followers, retweets, etc.), essentially homophilic, you will likely find echo chambers. But if you analyse actual interactions (comments, replies, quotes, etc.) the picture is more dynamic," adds Roth. "Echo chambers may

exist in closed groups, but I don't believe they really exist widely in the way usually meant."

Towards a theory of socio-semantic communities

Roth hopes that SOCSEMICS's findings help mitigate some of the moral panic associated with online communities, as spaces sparking social, political and cultural polarisation.

Towards this end, a number of the libraries, tools and data sets developed have been made available to the research community to adopt and adapt.

Meanwhile the project's graphbrain tool, also publicly accessible, is currently being developed into an industrial application.

"We aim to deliver a tool that could popularise those linguistic research tasks too small for large AI-driven companies, but too large for small-scale specialist research," explains Roth.

Keywords

SOCSEMICS, echo chambers, social media, online communities, polarisation, semantic, network, Twitter, Reddit

Project Information

SOCSEMICS

Grant agreement ID: 772743

DOI
10.3030/772743

Project closed

EC signature date
6 April 2018

Start date
1 June 2018

End date
31 August 2024

Funded under
EXCELLENT SCIENCE - European Research Council (ERC)

Total cost
€ 1 760 037,50

EU contribution
€ 1 760 037,50

Coordinated by
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS
France

Last update: 31 January 2025

Permalink: https://cordis.europa.eu/article/id/456226-is-the-idea-of-online-echo-chambers-itself-only-an-echo