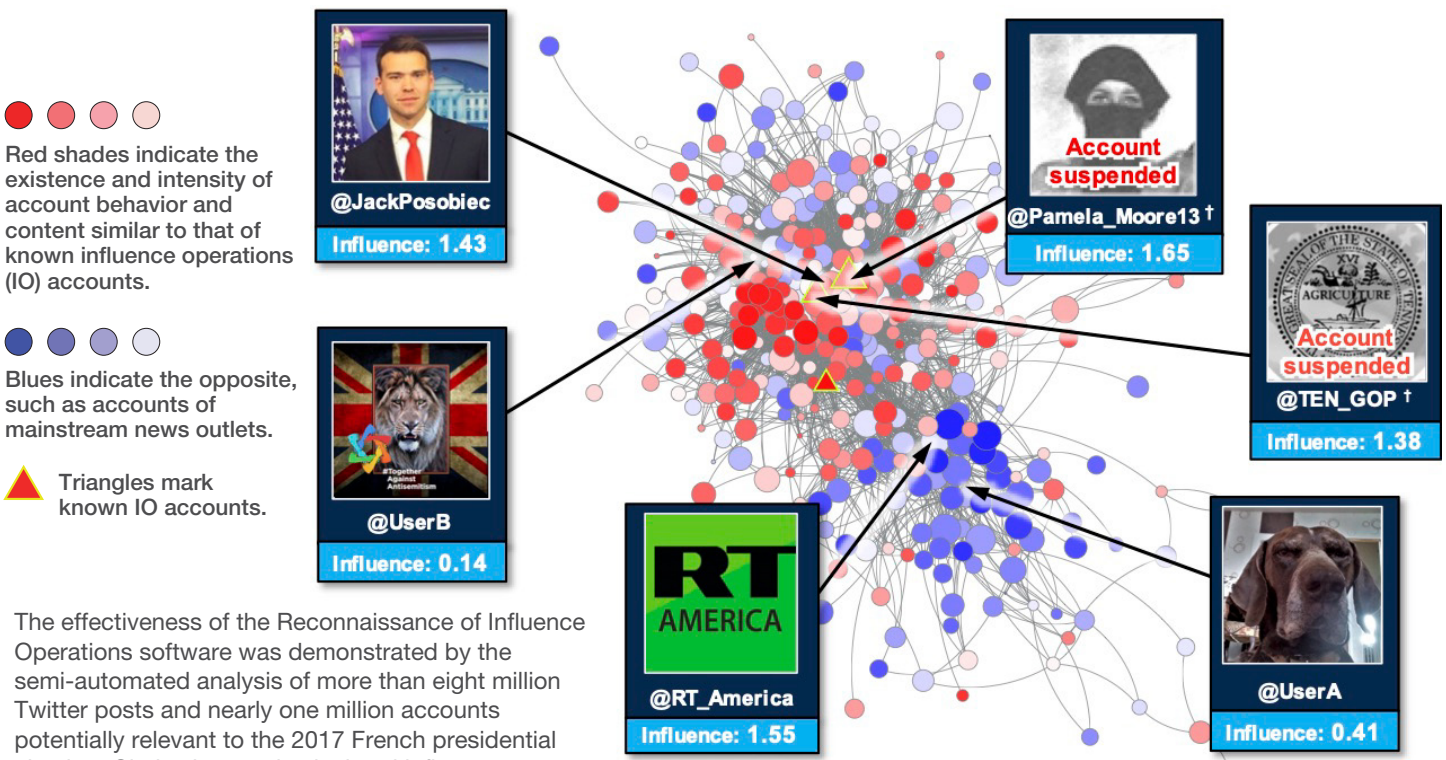
MIT LINCOLN LABORATORY

INNOVATION HIGHLIGHT

Technology in Support of National Security | WWW.LL.MIT.EDU

Reconnaissance of Influence Operations



The effectiveness of the Reconnaissance of Influence Operations software was demonstrated by the semi-automated analysis of more than eight million Twitter posts and nearly one million accounts potentially relevant to the 2017 French presidential election. Circle sizes and calculated influence scores denote level of impact of the accounts.

Researchers at MIT Lincoln Laboratory demonstrated an end-to-end software prototype that automates the detection of hostile influence narratives, the identification of accounts engaged in influence operations, and the quantification of the impact individual actors have on spreading their disinformation narrative. The system combines advanced artificial intelligence techniques: natural language processing, machine learning, graph analytics, and a causal inference approach to measuring influence within a network.

KEY FEATURES

- Semi-supervised approach to classifying influence operations (IO) accounts enables faster discovery of vastly more accounts than can be done by a wholly manual process
- Impact of each influencer is predicted more accurately than is estimated from simple counts of IO social media actions
- Semi-automated classifier performs with 96% precision and has outperformed two online bots used to detect IO activity

LINCOLN LABORATORY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Motivation

Using disinformation and propaganda as tools of warfare dates back to antiquity. However, the contemporary information environment powered by the Internet enables hostile actors to conduct such campaigns with immense scale, speed, and reach. These influence operations have been employed against the United States and its allies in attacks on their democratic processes. Recently, widespread influence operations undertaken by hostile foreign actors have spread misinformation about the COVID-19 pandemic, threatening public health.

A word cloud developed in identifying a specific IO narrative (offshore accounts) in the analysis of the 2017 French presidential election shows the keywords associated with the topic; relevance to narrative is indicated by size of text.

Methodology

1. Collect potentially relevant social media content (e.g., Twitter posts) based on keywords, accounts, languages, and spatiotemporal ranges.

2. Identify distinct narratives by using a type of machine-learning-based natural language processing called topic modeling.

3. Tag the accounts related to narratives identified in step 2 with a machine-learning classifier score based on their behavioral, linguistic, and content features. Steps 2 & 3 may be iterated to provide a more focused corpus for IO narrative detection.

4. Use graph analytics to construct an IO social network based on the pattern of interactions of accounts.

5. Quantify the impact of each account—measured by its contribution to the narrative spread over the network—by using a novel network causal inference methodology.

The end product of this methodology is a mapping of the IO narrative network in which IO accounts of high impact are identified. This approach has measurable and noteworthy advantages over traditional impact statistics that are based on activity count (e.g., tweet and retweet counts) and network topology (e.g., network centralities) in discovering high-impact IO accounts.

INTERESTED IN ACCESSING THIS TECHNOLOGY?

Contact the MIT Technology Licensing Office
https://tlo.mit.edu/
tlo-inquiries@mit.edu 617-253-6966

PATENT PENDING
2019/0311441 A1

INTERESTED IN WORKING WITH MIT LINCOLN LABORATORY?

https://www.ll.mit.edu/partner-us

Contact the Technology Ventures Office
tvo@ll.mit.edu

More Information

S.T. Smith et al., "Automatic Detection of Influential Actors in Disinformation Networks," *Proceedings of the National Academy of Sciences of the United States of America*, 26 Jan. 2021.

Approved for public release; distribution is unlimited. This material is based upon work supported by the Under Secretary of Defense for Research and Engineering under Air Force Contract No. FA8702-15-D-0001. Any opinions, findings, conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the Under Secretary of Defense for Research and Engineering.