Thesis Proposal
Institute for Software Research
Societal Computing

Methods for detection, analysis, and disruption of Online Extremist Communities

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The rise of the Islamic State of Iraq and al-Sham (ISIS) has been watched by millions through the lens of social media. This “crowd” of social media users has given the group broad reach resulting in a massive online support community that is an essential element of their public affairs and resourcing strategies. Other extremist groups have begun to leverage social media as well. Online Extremist Community (OEC) detection holds great potential to enable social media intelligence (SOCMINT) mining as well as informed strategies to disrupt these online communities. I present Iterative Vertex Clustering and Classification (IVCC), a scalable analytic approach for OEC detection in annotated heterogeneous networks, and propose several extensions to this methodology to help provide policy makers the ability to identify these communities at scale to understand members’ interests and influence. Ultimately, these methods could provide unique insights to shape information operations, intervention strategies, and policy decisions.

In this thesis, I propose the following contributions:

- efficient search and discovery of OEC members via semi-supervised dense community detection
- an active learning framework to incorporate regional expertise and enable monitoring of highly dynamic OECs
- a formal study of mention strategies used to gain social influence in within a target online community
- an extended literature review of methods applicable to detection, analysis, and disruption of OECs

The contributions proposed in this thesis will be applied to four large Twitter corpora containing distinct online communities of interest. My goal is to provide a substantive foundation enabling follow-on work in this emergent area so critical to counter-terrorism and national security.

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