Terrorism Detection and Intervention on Social Media Using Machine Learning

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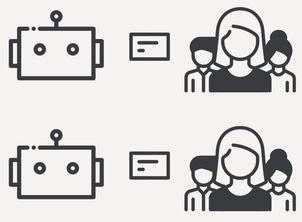
We present a system that combines machine learning and crowdsourcing to detect the online radicalization level of an individual across different social media platforms and across different areas (e.g., affiliation to ISIS, white supremacy, or organized crime). The military can use this system to identify potential terrorists online.

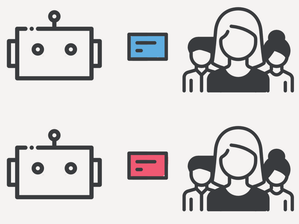
INTRODUCTION

Social Media platforms, e.g., Facebook, Twitter, Reddit, have become swamps for terrorist recruitment and radicalization.

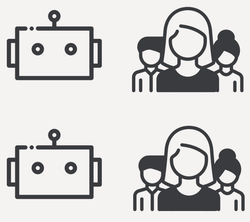
ONLINE RADICALIZATION DETECTION VIA CROWDSOURCING AND MACHINE LEARNING.



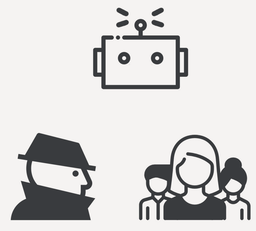
To detect potential terrorists and their radicalization level across different social media sites we propose to combine machine learning with crowdsourcing.



We use machine learning models to quantify the radicalization level of an individual across different areas (affiliation to ISIS, white supremacy).



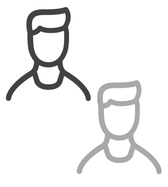
We use crowdsourcing to verify the person's identification across social media channels and their radicalization level.



By combining machine learning and online radicalization we create a more robust detection of radicalized individuals and potential terrorists

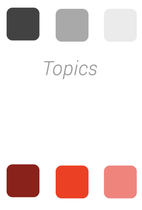
IDENTIFY TYPES OF RADICAL INDIVIDUALS

Crowdsource examples of radical individuals on diferent social media platforms.



Labeled Radicalized Individuals

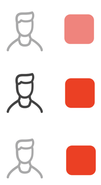
Discover topics and slang that define radical individuals



Topics

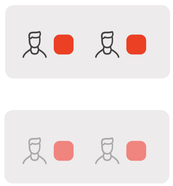
Slang

Model radical individuals as a feature vector with probabilistic graphical model



Vectorized Radicals

Cluster radical individuals based on feature vector

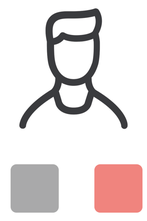


Clusters of Radicalization

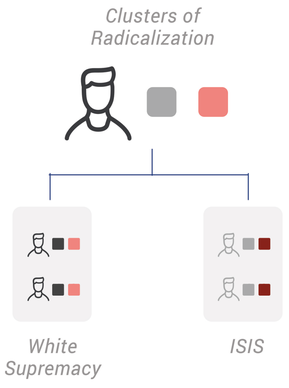
$$P(o,T) = \sum_{f \in \mathcal{F}} P(o)P(f|o)P(T|f),$$

MODEL RADICALIZATION SCORE OF ANYONE

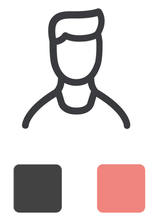
Model individual as a feature vector based on topics and slang



Measure distance of individual radicalization clusters



Use cosine similarity as Radicalization Score



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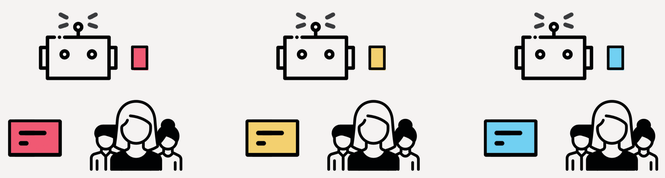
White Supremacy

INTERVENTION STRATEGIES



Bots recruit human citizens and initiate collaboration with them.

Diversity + Stalling Detection Algorithms

Data visualization of citizens and their work

Patents and Papers

*Participatory Militias: An Analysis of an Armed Movement's Online Audience CSCW'15
*Botivist: Mobilizing Volunters with Bots, CSCW'16
*Socialy and Contextualy Appropiate Recommendation Systems, Us Patents