Web Analytics for Security Informatics

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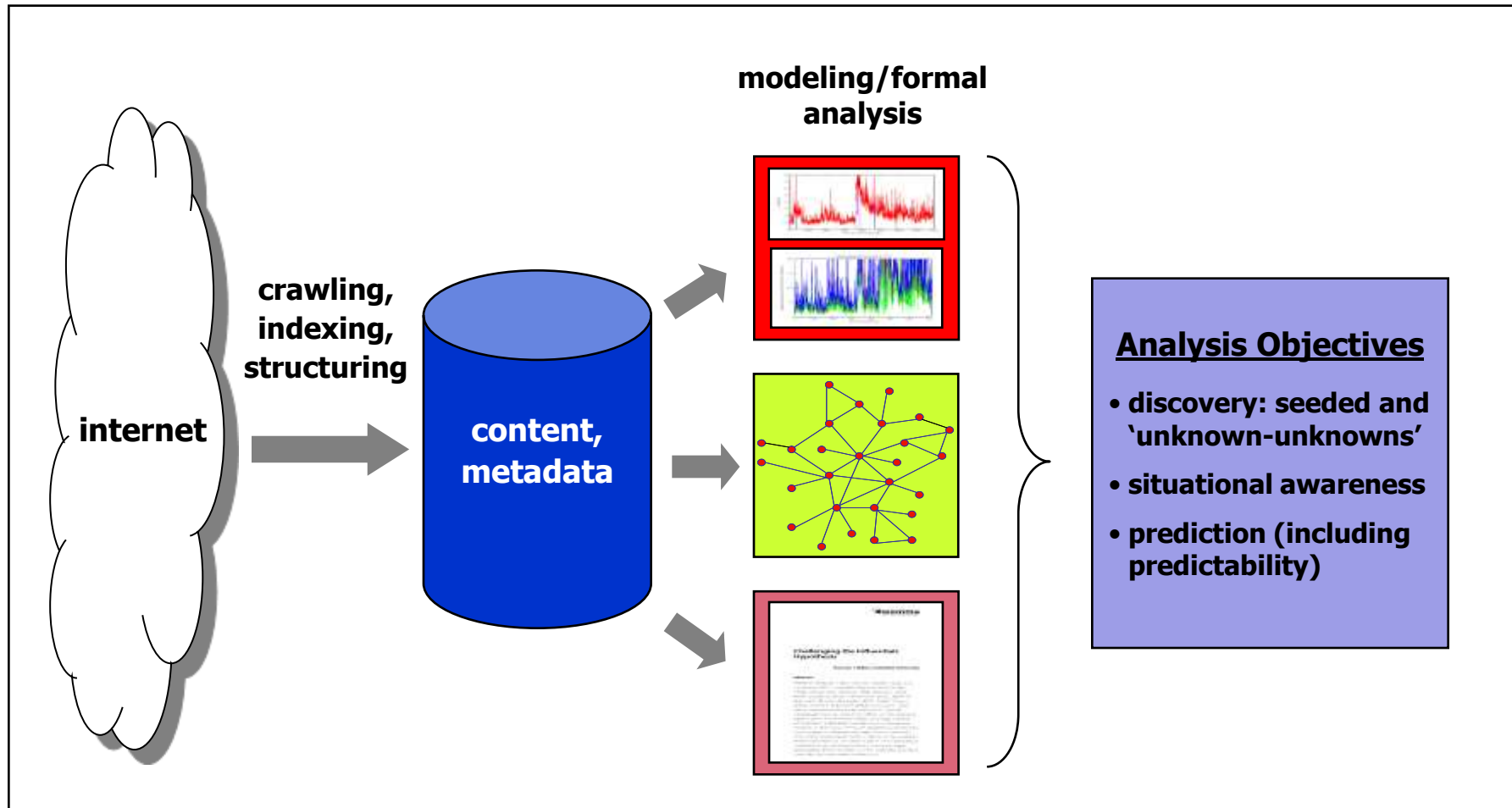Chief Scientist
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Analytic Approach

Basic idea

modeling/formal analysis

internet

crawling, indexing, structuring

content, metadata

Analysis Objectives

• discovery: seeded and 'unknown-unknowns'

• situational awareness

• prediction (including predictability)

Meme Analysis

Motivation: capability to detect significant, emerging "memes" at Web-scale has considerable utility.

Challenges: scalability, informal content, diffusion prediction.

Technical innovation: prediction via analysis of meso-scale social media dynamics.

Example: U.S. political memes [Leskovec et al. 2009], protest memes [Colbaugh/Glass 2010].
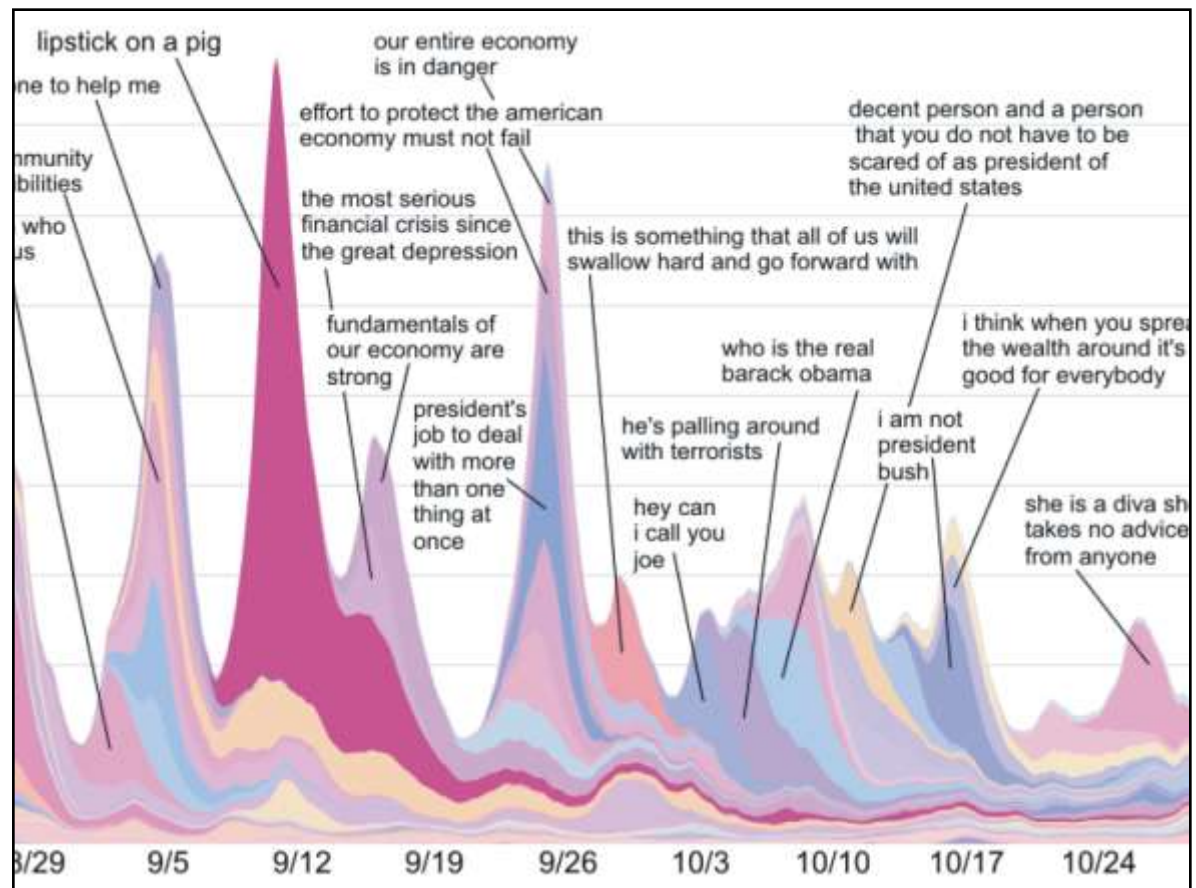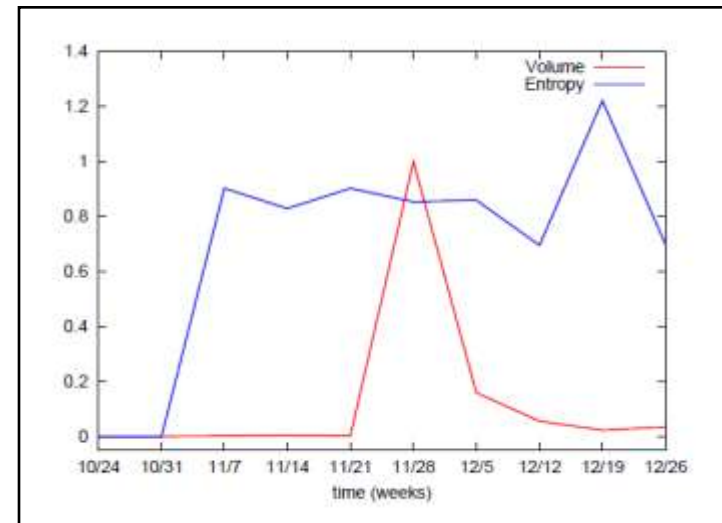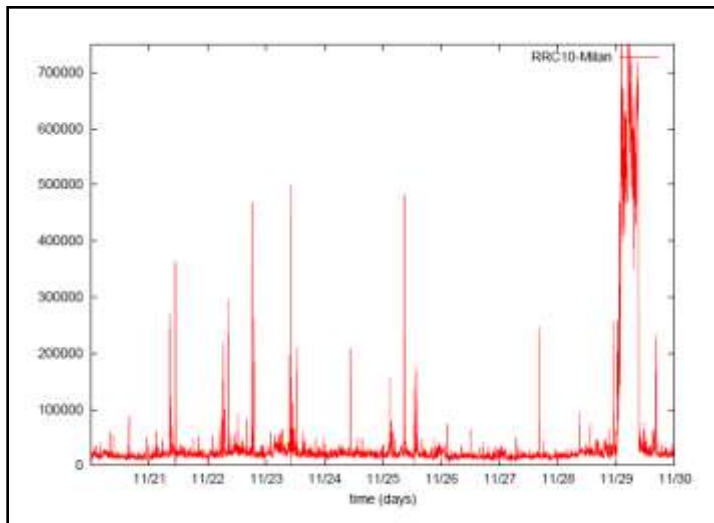
Sample Application

Meme analysis for emerging threat warning

Sample questions: What are emerging threats in domain of interest? What are likely impacts/consequences? Which intervention strategies might be effective?

Approach: 1.) identify emotional posts, 2.) detect memes, 3.) extract memes likely to 'go viral'.

Case study: politically-motivated cyber attacks (e.g., DoS against WikiLeaks).

Sample Application

Meme analysis for situational awareness

Sample questions: What is the sentiment of a given population concerning a particular topic? What is the associated trend?

Approach: Bipartite graph-based, semi-supervised machine learning (e.g., for *agile* analysis).

Case study: Estimate regional public opinion regarding former Egyptian President Hosni Mubarak during weeks prior to the protests.