Diffusion and Amplification of Misinformation on Social Media: A Psychological and Technological Approach

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INTRODUCTION

- Social media has become a breeding ground for misinformation, including fake news, propaganda, and conspiracy theories.

- The information ecosystem is a complex entity made of various components that interact and depend on each other to maintain a functional and healthy ecosystem.

- Studies have shown a strong relationships between noise and the spread of misinformation which in return can affect and alter the original intended message.

INTRODUCTION

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PURPOSE OF THE STUDY

- Given the subjective nature of topic and the complexity associated with in what constitute misinformation, there is a need for identifying alternative approaches and methods to reduce the noise and its impact on the original intended message.

- This study investigates the relationship between social noise and misinformation and explore different methods and techniques that could be used to quantify social noise and reduce uncertainty and disorder on social media platforms.

METHODOLOGY
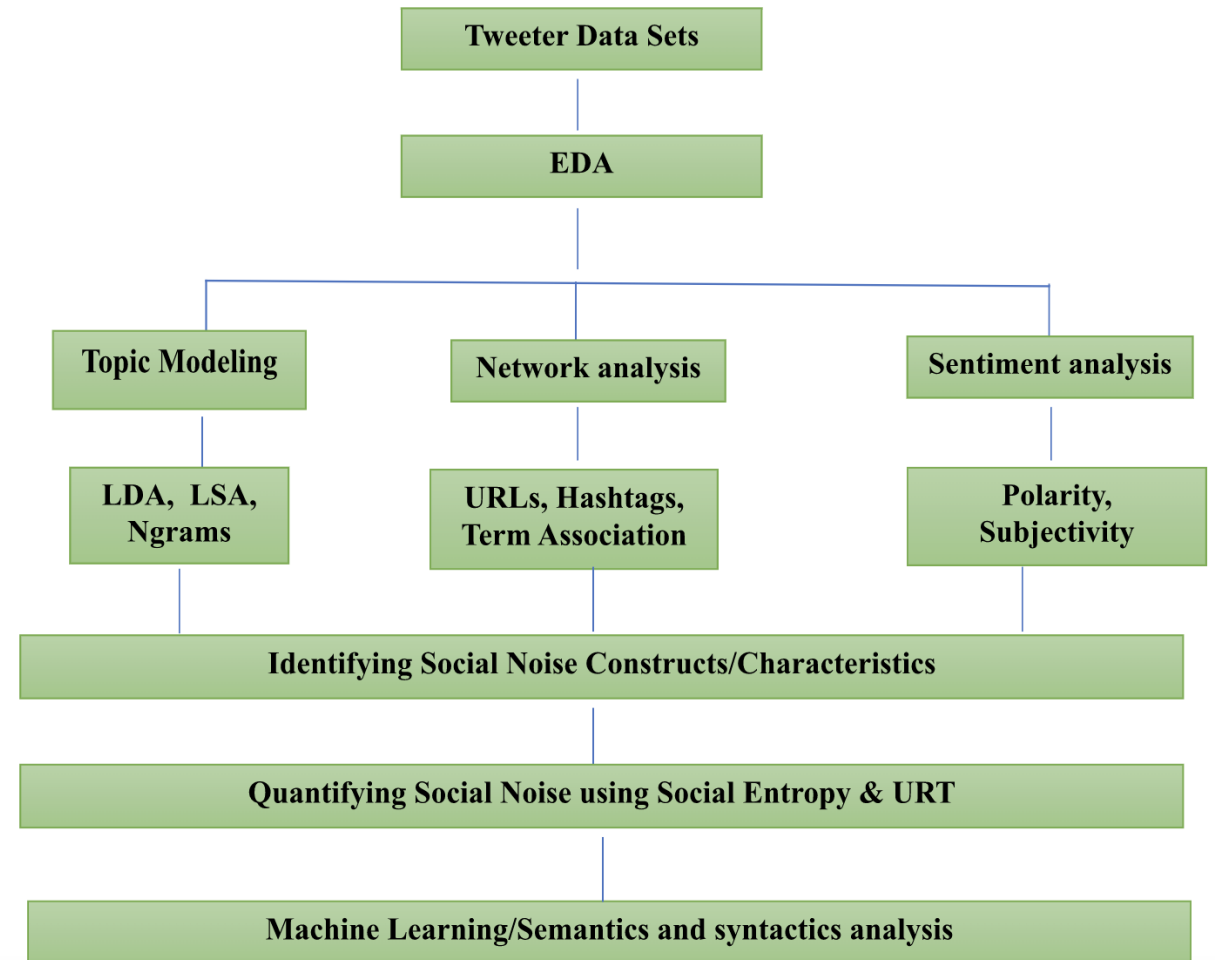
Proposed Social Communication Model
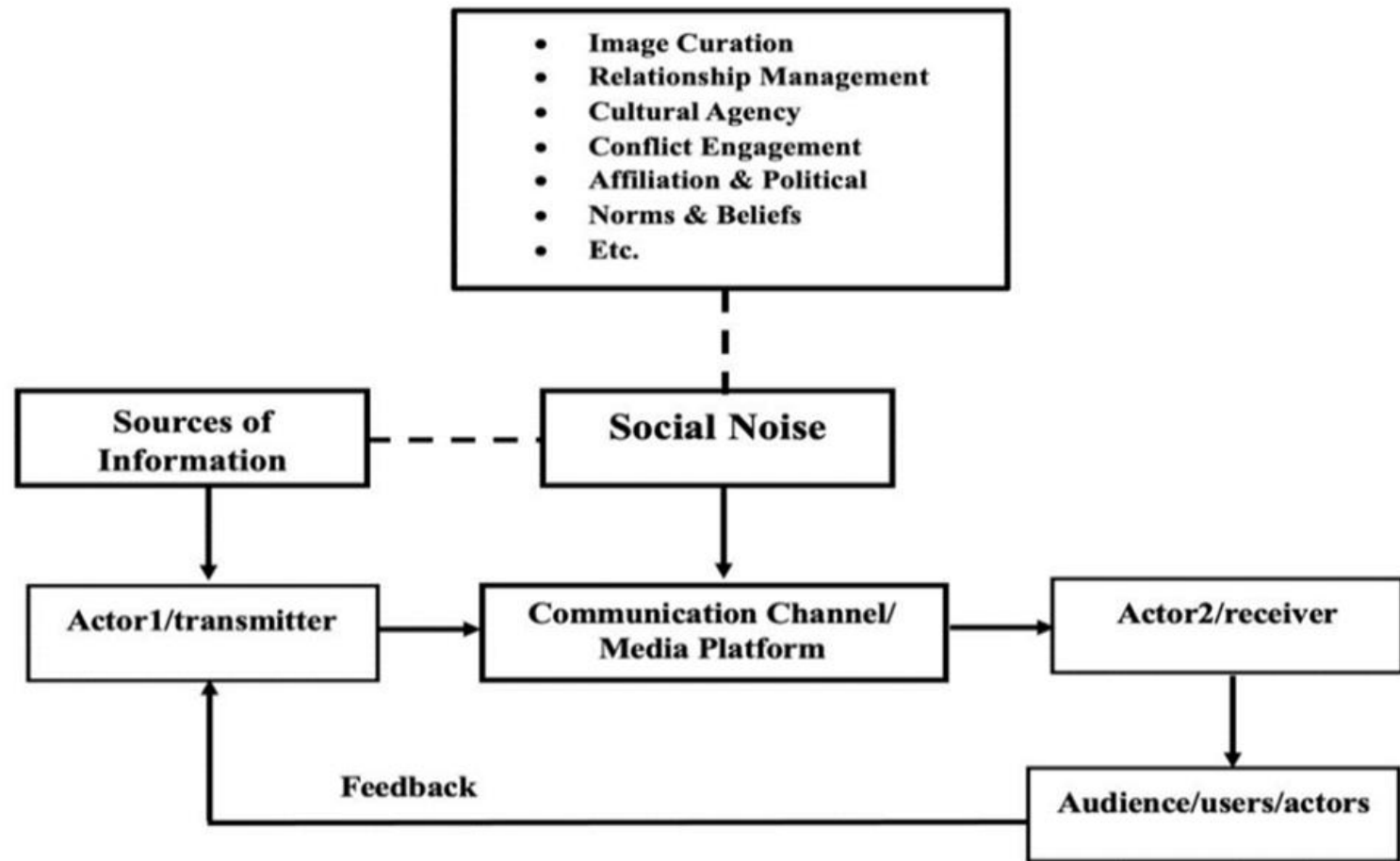
Data Analysis

Data for this study were collected from two different hashtags:

- The #BLM hashtag was collected for the period May 25th to June 10th, 2020, and includes a total of 104,546 records.

- The #Ukraine hashtag was collected for the period from January 1 to June 30, 2023, and includes 1 million tweets.
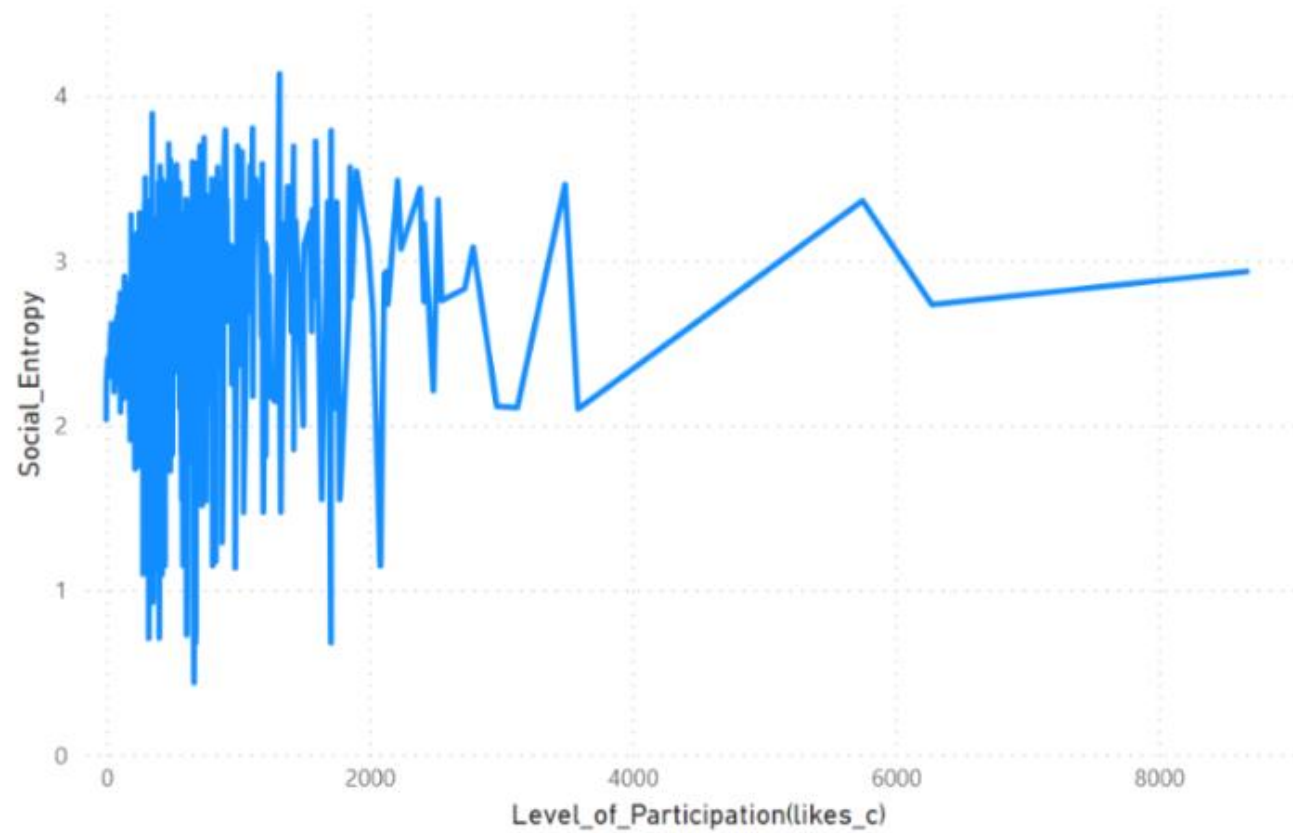
FINDINGS

| Construct	Definition	Sample Keywords
Image Curation	**Is the effort by a social media user, consciously or unconsciously, to craft their online identities**	**Please, willing, identity, recommend, report, thank, determination, express agree, finds no grounds, too hot, safe, allies, needs, great, flowers**
Relationship Management	**Refers to a user's understanding of their roles and responsibilities within social institutions as well as the level of confidence in their personal beliefs**	**Love, want, help, please, equivalent, humanity, stop the violence, awareness, defense, influence, mutual aid, absurdity, ordinated, advising, kindle, love, make your own, me again thankfully, need, protect health, protect public health, safety, save, taking steps, to protect health, to reduce, peace, force**
Conflict Engagement	**Is the level of social conflict with which a user is comfortable**	**stop, humiliation, mistreat, misconduct, controversial, war, discord, defense, blamed, stop Russia, change could kill, war, disgraced, disruption, fraud, hack off, hot head, may kill, no grounds for, scam exposed, undeniable, terrorist, attack, holy**
Cultural Agency	**Is characterized by civic participation in social issues and is exhibited by individuals who believe in their own power to be heard and to shape culture and beliefs**	**radical, recommend, government, western, revolution, leadership, diversity, community, social, systemic brainwashed, Ukrainians, experts agree humans, fair ambitious, fighting chance**
Affiliation and Politics	**Is characterized by loyalty to a political party, religion, or an organization. This could include people paid to carry out certain activities or advertise certain products.**	**racist, system is racism, supremacist, supremacy, cult, fascist, Russians, Ukrainians, supporting, our community, climate change denial, blame it on, scam, military, democracy**
Norms and Beliefs	**Is characterized by deep beliefs, culture, ideology, religion, a cause etc.**	**change culture, we demand justice, equity, inclusion, fight racism, socialists, communists, anarchists, conservative, extremist, denialism, don't believe, dreaming, myth, regulation, sure about global warming**
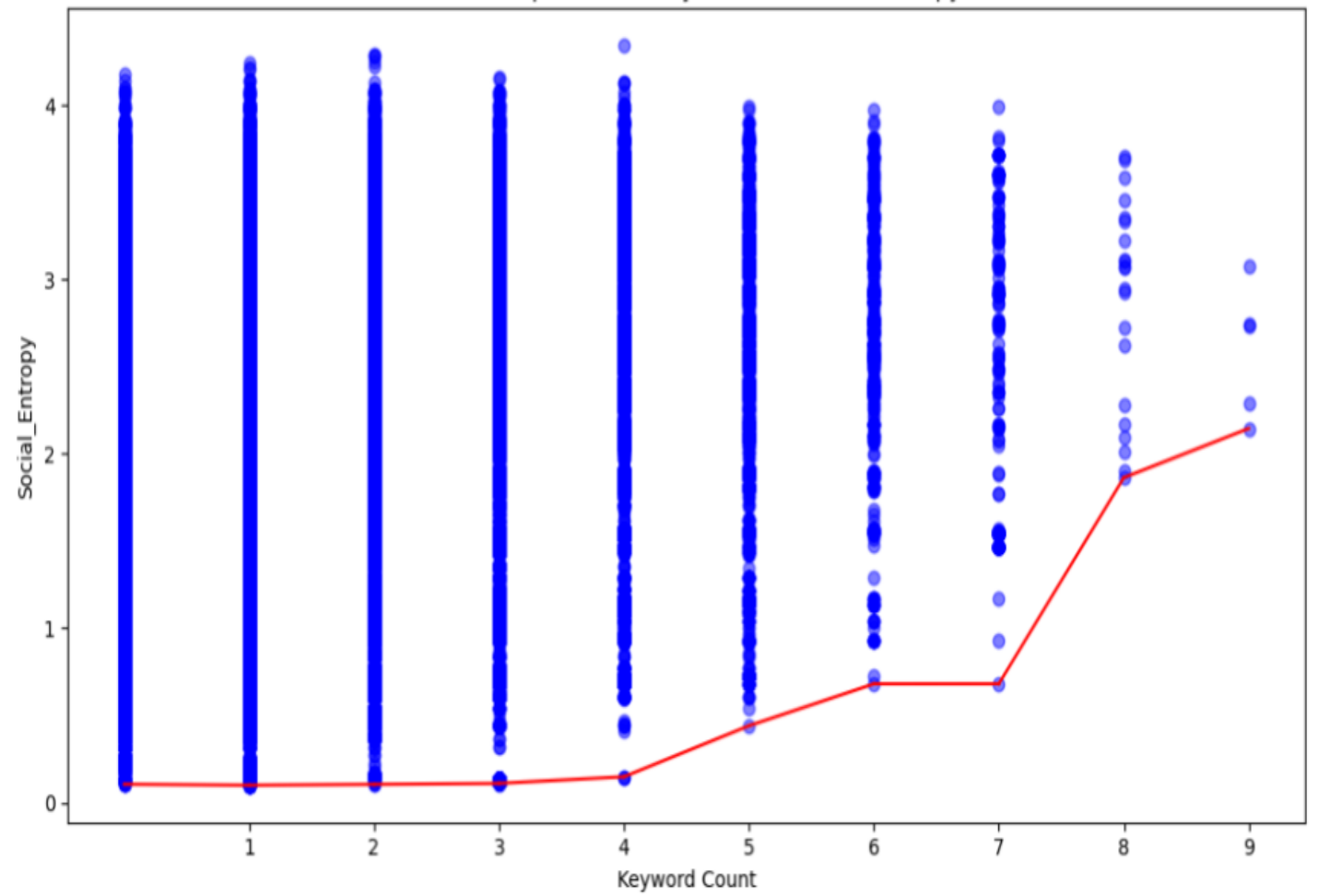
FINDINGS

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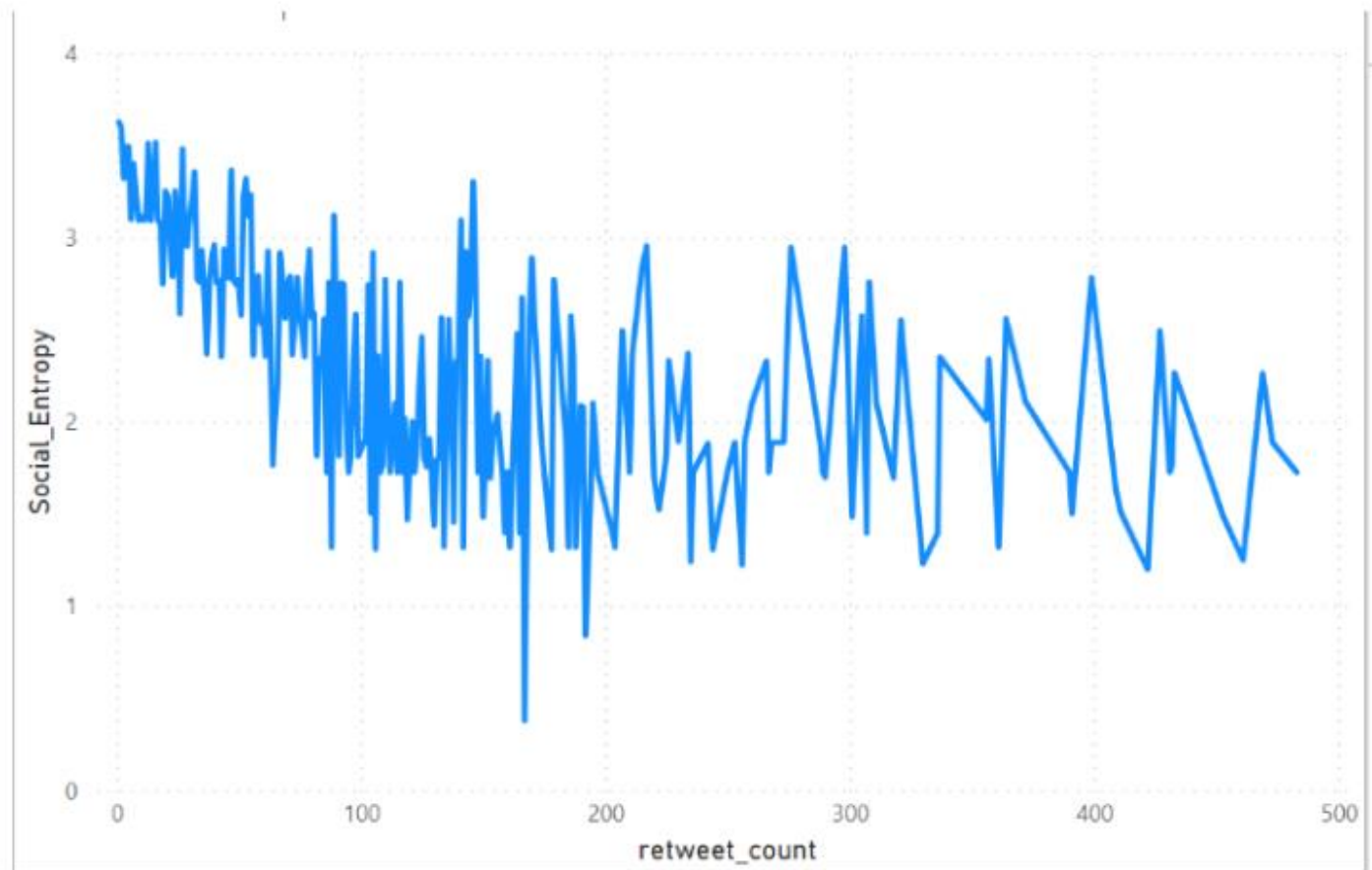
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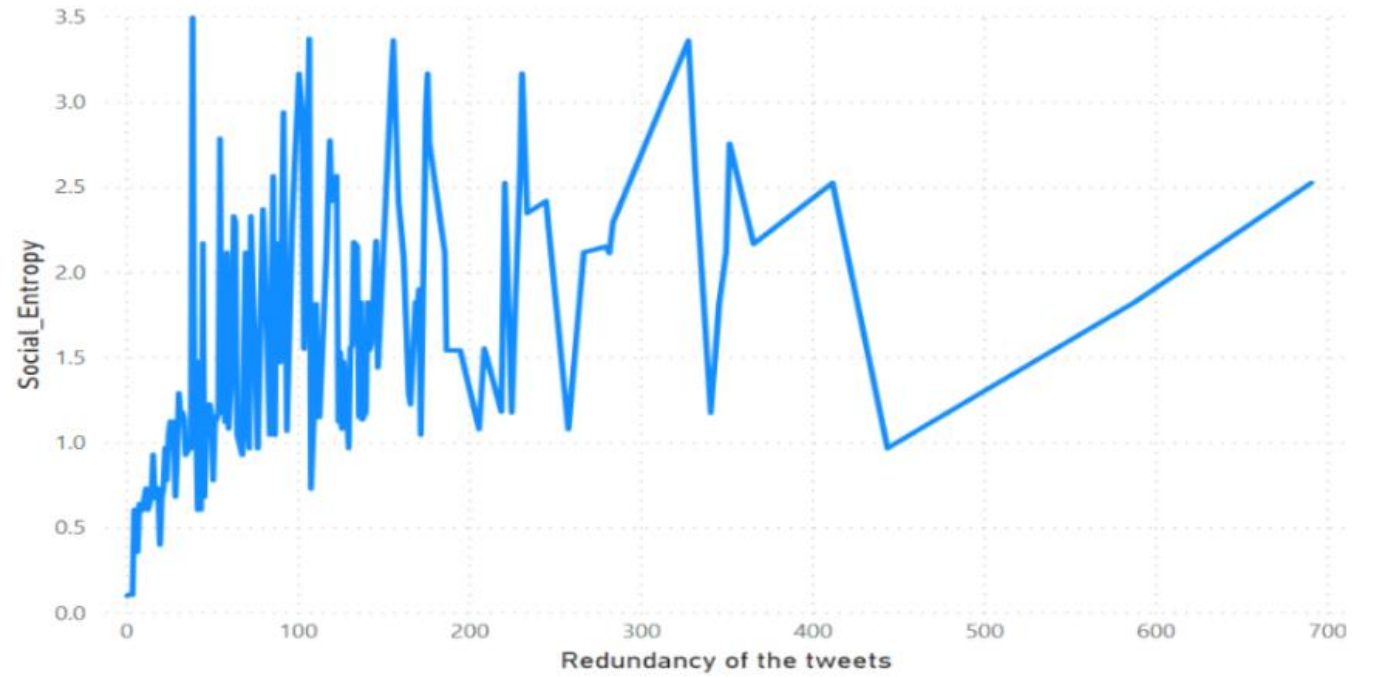
RESULTS
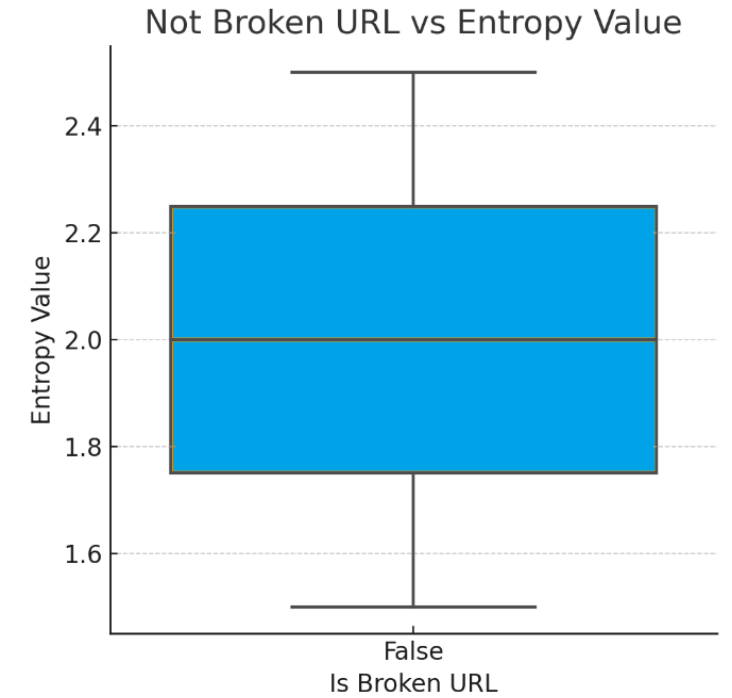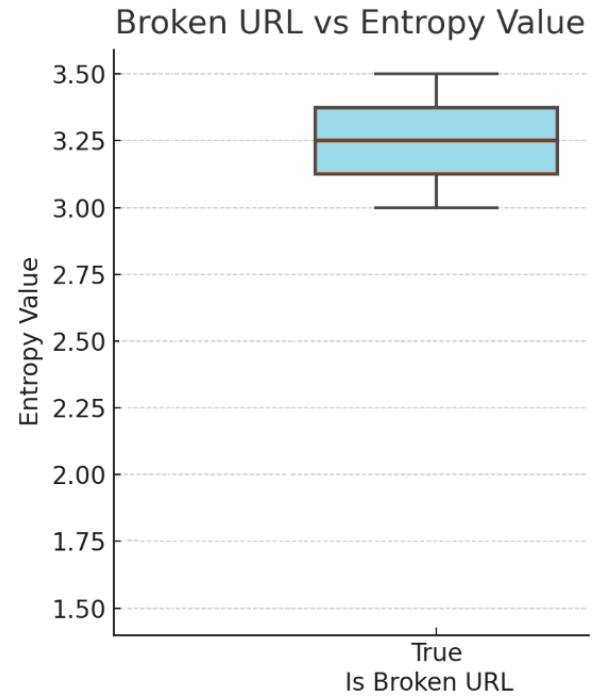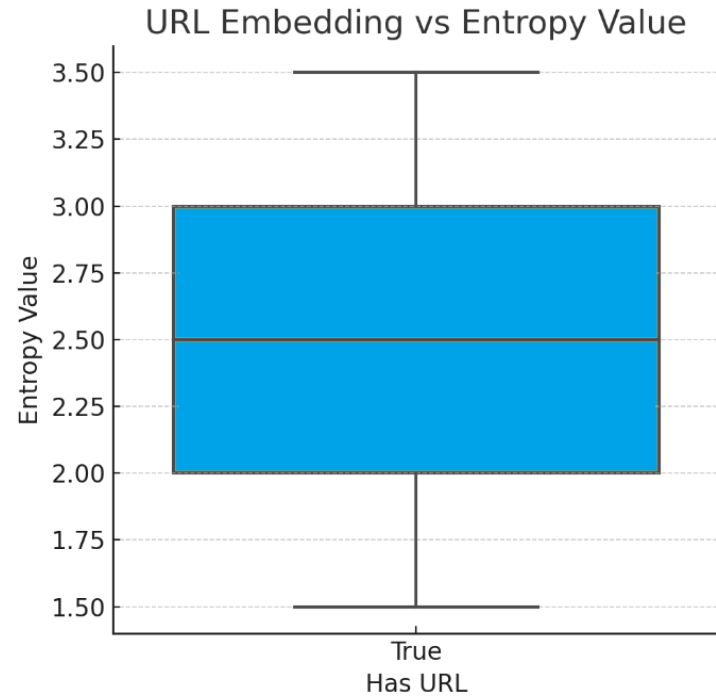
- Kernel Density Estimate (KDE) represents the estimated density of tweets at different entropy levels.

- There is an inverse relationship between social entropy and URLs embodied in tweets

- Indicating that tweets with low entropy are richer in content and less likely to constitute noise

What is next?

- Studies have shown significant progress in using social entropy to quantify social noise and determine the level of participation in social media discussion.

- social entropy can be used to measure the diversity of interaction or the unpredictability of engagement patterns.

- Machine learning tools such as Graph Convolutional Networks (GCN) and Graph Neural Networks (GNN) can be further used to enhance the results and pave the way for information providers to develop modules capable of detecting social noise.

- The key to combatting misinformation is to understand the human psychology of why people believe and share false or highly misleading information

- One approach is to expand the existing research to include social theories such as Dual Process Theories

Dual Process Theories

- Intuition versus Deliberation
- Heuristic. versus Analytic
- Reflective system versus impulsive system

Any Question?