

AI in Social Media Data Mining: Viewing Through the Lens of Ethical Aspects

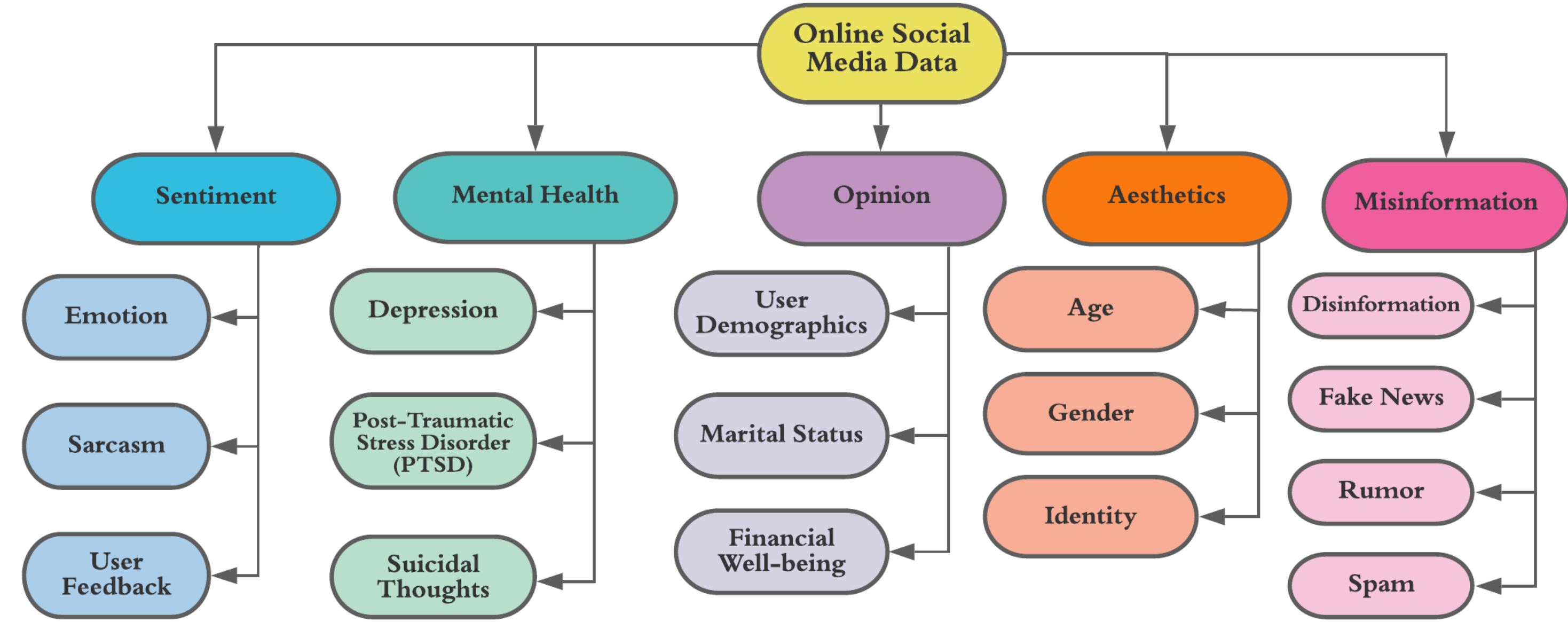
Fahim Anzum, Ashratuz Zavin Asha, Marina L Gavrilova
Department of Computer Science, University of Calgary



Preamble

The growing popularity of online social networks (OSNs) have significantly contributed to the data analysis and decision-making process in various domains. However, although it has enabled the researchers to access and analyze the user-generated data, the ethical aspects are rarely given any consideration. Therefore, our primary aim is to address the potential biases, fairness, and limitations of artificial intelligence (AI) in social media data mining, and to present strategies to mitigate them.

Taxonomy of Social Media Data Mining



Understanding Bias

In AI, bias is often considered as the “inclination or prejudice of a decision made by an AI system which is for or against one person or group, especially in a way considered to be unfair” [1].

Bias Causing Factors in the Data Mining Workflow

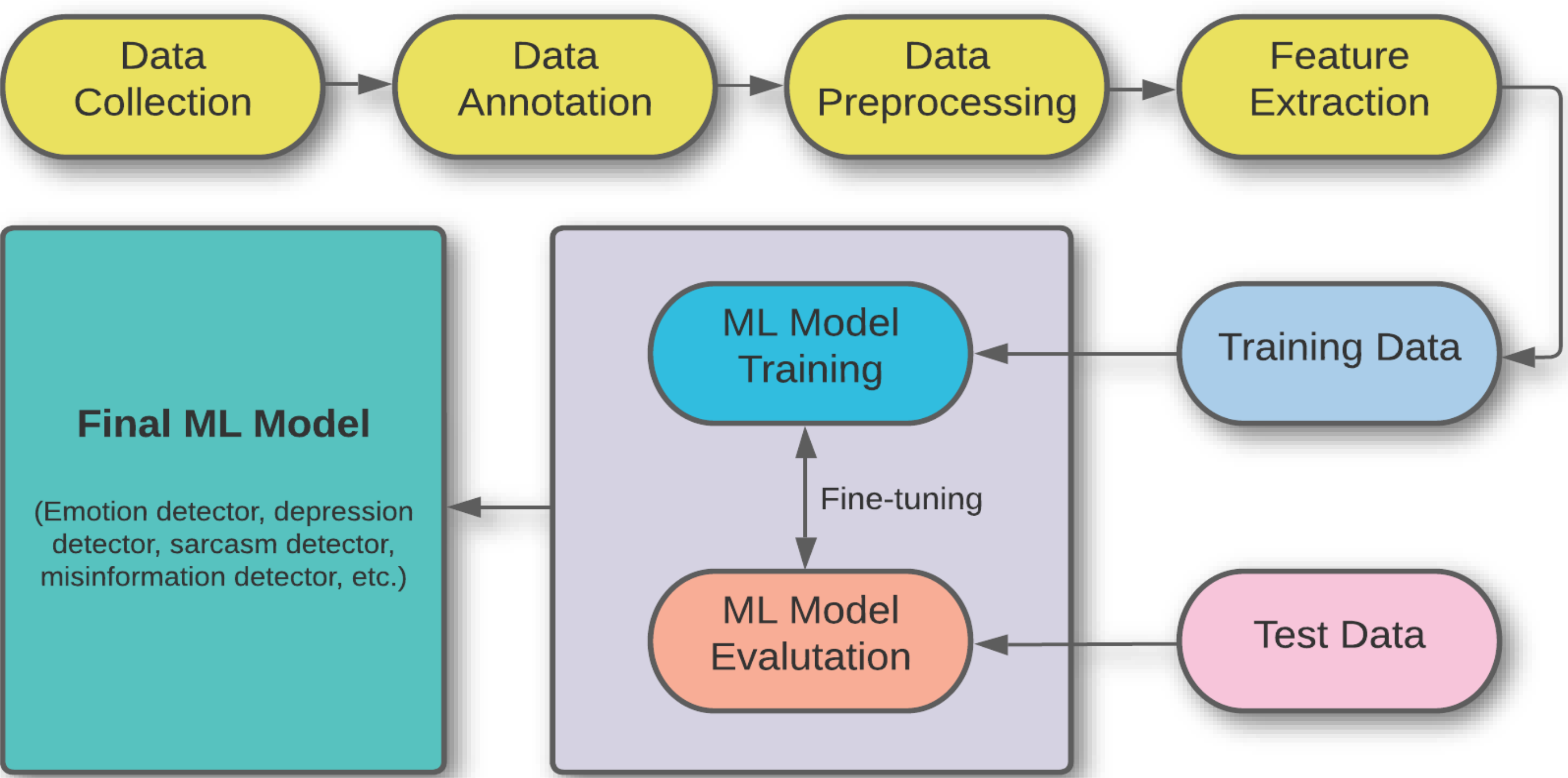
Who Is Collecting The Data

User Demographics and Diversity of the Dataset

Who is Annotating The Data and How the Data is Annotated

Users’ Writing Patterns and Behavioral Characteristics

Workflow of AI in Social Media Data Mining



Fairness of AI Model’s Predictions

- A machine learning model learns what it is been trained on.
- Biased training data leads to a biased machine learning model that would generate false predictions.

Risks and Implications of Using Social Media Data in AI Model Development

- It can be perceived as an intrusion to privacy and security.
- False predictions can negatively impact someone’s personal, professional, and social life [2].
- People might share less about themselves, become fake, and lose connectivity on social media.

Bias Mitigation Strategies in AI Model Development with Social Media Data

Introducing Diversity in the Dataset

While collecting data, users representing diverse demographics, age, country of origin, writing proficiency, etc. would make the dataset fairly diverse

Adding Datasheets for Datasets

Explicitly addressing the method of data collection and annotation, potential limitations, fairness, and biases in the documentation would inform the future researchers about the characteristics of the dataset

Qualitative Analysis of Data

Qualitative data analysis would enable the researchers understanding users attitudes and acknowledging human complexities. Therefore, peoples' preferences, expectations, and values could be addressed and prioritized by the innovators

Conclusion and Future Works

- While improving AI models’ accuracies are important, considering the ethical aspects should be given extensive significance as well.
- Future research should investigate sophisticated strategies, account for human attitudes and the social contexts in designing technologies to mitigate the biases and fairness issues.

References

- [1] E. Ntoutsis, P. Fafalios, U. Gadiraju, et al. “Bias in data-driven artificial intelligence systems - an introductory survey.” *Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery*, 10(3):e1356, 2020.
- [2] Fahim Anzum, Ashratuz Z. Asha, Marina L. Gavrilova, “Biases, Fairness, and Implications of Using AI in Social Media Data Mining”, Accepted to be published in *2022 International Conference on Cyberworlds (CW)*, 2022.