

Computational Analysis of Polarization in Central Asian Digital Discourse: A Transformer-Based Approach to Discursive Strategies in Social Media Comments

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Abstract: Paper examines the nature of polarization in Central Asian social media discourse using transformer-based computational models. It combines quantitative methods, such as sentiment and toxicity analysis, with qualitative discourse analysis to identify key communicative strategies. The findings reveal a high level of negative and conflict-oriented language, often shaped by multilingual and socio-political contexts. The study highlights both the effectiveness and limitations of NLP tools in capturing culturally specific meanings in digital communication.

Keywords: Digital discourse; Central Asia; Social media comments; Transformer models; Sentiment analysis; Toxicity detection; Code-switching; Discursive strategies.

Introduction: In recent years, social media has become a central space for public discussion in Central Asia. Platforms such as Telegram, Facebook, and YouTube comments are widely used in Uzbekistan, Kazakhstan, and neighboring countries. These platforms allow users to express opinions freely, but they also increase the level of polarization in public discourse.

Polarization in digital communication can be defined as the division of opinions into strongly opposed groups. This often leads to emotional language, conflicts, and the spread of misinformation. In Central Asia, political reforms, economic changes, and cultural debates have contributed to this process. However, there is still limited academic research focusing on computational analysis of such discourse in the region.

This study aims to analyze polarization in Central Asian social media comments using transformer-based models. The research focuses on identifying discursive strategies, such as emotional framing, argumentation patterns, and linguistic markers of conflict. The main goal is to understand how polarization is constructed and expressed in online communication.

METHODOLOGY

The study uses a mixed-method approach combining computational linguistics and discourse analysis. The dataset consists of approximately 50,000 social media comments collected from Telegram channels, Facebook pages, and YouTube videos related to political and social topics in Central Asia.

Data collection was carried out over a period of three months. The comments were selected based on relevance to public debates, including governance, language policy, and economic issues. All personal data was anonymized to ensure ethical standards.

For the computational analysis, transformer-based models such as BERT and multilingual variants (mBERT, XLM-R) were used. These models are effective in processing multilingual data, which is important in the Central Asian context where Uzbek, Russian, and Kazakh are often mixed.

The analysis included:

1. Sentiment classification (positive, negative, neutral)
2. Detection of toxic or aggressive language
3. Identification of key topics using topic modeling

4. Classification of discursive strategies (e.g., accusation, justification, sarcasm)

Additionally, qualitative discourse analysis was applied to selected comment threads to better understand context and meaning.

RESULTS

The results show a high level of polarization in the dataset. Approximately 62% of comments were classified as negative or strongly opinionated. Toxic language was present in around 28% of the comments, especially in discussions related to politics and national identity.

Topic modeling revealed several dominant themes:

- Government policies and reforms
- Economic challenges
- Language and identity issues
- International relations

Transformer models achieved relatively high accuracy (around 85%) in sentiment classification and toxicity detection. The multilingual models performed better than monolingual ones due to code-switching in the data.

Discursive strategies analysis showed that users frequently use emotional language, personal attacks, and generalizations. Sarcasm and irony were also common, especially in politically sensitive discussions. Many users relied on simplified “us vs. Them” narratives, which strengthened group identity but reduced constructive dialogue.

Analysis

The findings suggest that polarization in Central Asian digital discourse is shaped by both linguistic and social factors. From a linguistic perspective, the frequent use of emotionally charged words, repetition, and rhetorical questions increases the intensity of discussions. Code-switching between Uzbek and Russian also plays a role, as it can signal group belonging or ideological position.

From a computational perspective, transformer-based models proved effective in identifying patterns of polarization. However, some challenges remain. For example, sarcasm and culturally specific expressions are not always correctly interpreted by the models. This is especially true in multilingual contexts where meaning depends on subtle cultural cues.

Another important observation is that highly polarized comments tend to receive more engagement (likes, replies). This suggests that platform algorithms may indirectly promote divisive content by prioritizing interaction.

DISCUSSION

The results of this study highlight the growing importance of digital discourse in shaping public opinion in Central Asia. The high level of polarization indicates a need for better moderation strategies and digital literacy programs.

One key issue is the role of language. In multilingual societies, language choice is not neutral. It can reflect identity, political stance, and social alignment. Therefore, analyzing discourse in such contexts requires tools that can handle linguistic diversity.

The use of transformer models opens new possibilities for large-scale analysis, but these tools should be combined with human interpretation. Purely automated analysis may miss important nuances, especially in culturally rich environments like Central Asia.

Furthermore, policymakers and researchers should pay attention to how online discourse influences offline behavior. Polarization in digital spaces can contribute to social tension if not addressed properly.

This study examined polarization in Central Asian social media comments using a transformer-based approach. The results show that polarization is widespread and is expressed through various discursive strategies, including emotional language, sarcasm, and direct confrontation.

Transformer models such as BERT and XLM-R are useful tools for analyzing multilingual data, but they have limitations in understanding context-specific meanings. Therefore, a combined approach that includes both computational and qualitative methods is recommended.

Future research should focus on larger datasets, more languages, and the development of region-specific models. It is also important to explore ways to reduce polarization and promote more constructive online communication.

REFERENCES

1. Devlin, J., Chang, M. W., Lee, K., & Toutanova, K. (2019). BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding.
2. Conneau, A., et al. (2020). Cross-lingual Representation Learning at Scale.
3. Jurafsky, D., & Martin, J. H. (2021). Speech and Language Processing.
4. Sunstein, C. (2017). Divided Democracy in the Age of Social Media.
5. Tufekci, Z. (2015). Algorithmic Harms beyond Facebook and Google.

6. Абдуллаев, А. (2021). Медийное пространство Центральной Азии: язык и общество. Ташкент.
7. Каримов, Б. (2020). Социальные сети и общественное мнение в Узбекистане.
8. Нуртазин, М. (2019). Языковая политика и идентичность в Казахстане.
9. Rahimov, D. (2022). Digital Communication Trends in Uzbekistan.
10. Saidov, U. (2021). Интернет-дискурс в Узбекистане.