SCHOOL OF COMPUTATION, INFORMATION AND TECHNOLOGY — INFORMATICS

TECHNICAL UNIVERSITY OF MUNICH

Bachelor's Thesis in Informatics in Informatics

From Hashtags to Ballot Boxes: A Close Look at the 2023 Turkish Election

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Von Hashtags zu Wahlentscheidungen: Ein umfassender Blick auf die Türkischen Wahlen 2023

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I confirm that this bachelor's thesis in informatics is my own work and I have documented all sources and material used.

Munich, 15.03.2023 Efe Sener

Acknowledgments

Abstract

Contents

1 Introduction

In recent years, governments and the public have realized the importance of social media, especially Twitter, which has a decisive role in mobilizing social and political activism (Uysal & Schroeder, 2019). Twitter has been instrumental in studying human behavior with social media data (Pfeffer et al., 2023), described as a digital social telescope by researchers in the social science field (Mejova et al., 2015). It has provided a somewhat free environment and guided social and political debates to gain new dimensions (Yerlikaya & Toker, 2020), where individual users can directly and publicly address comments to their representatives under conditions of anonymity (Theocharis et al., 2020). The robust rise in Twitter's popularity has stemmed from increasing accessibility to technology and affordability. Millions of people consume news from social media sites like Twitter (Anwar et al., 2021). In Turkey's case, Twitter began to be taken seriously after the unrest in the Middle East, especially after the Gezi Park protests in 2013 (Zaharna & Uysal, 2016), where Twitter was one of the most valuable media for protestor communication, given censorship (Ogan & Varol, 2017).

This thesis aims to analyze the Twitter data, provided by Sabanci University (Najafi et al., 2022), to understand the Turkish Twitter discourse surrounding the May 2023 elections. Using innovative topic modeling techniques, this thesis will discover the most prevalent topics in Turkish Twitter between July 2022 and June 2023. It will uncover how these topics correlate with real-life events and how they reflect the election agendas of parties. This thesis will also compare the results with results observed in other countries. In a non-English-speaking country like Turkey, this thesis furthermore seeks to find solutions to the need for a more thorough and data-driven analysis of political discussions on Turkish Twitter.

In this chapter, the thesis starts by explaining the historical context and then continues to present the current political landscape. It demonstrates the importance of the May 2023 elections, emphasizes the significance of Twitter in Turkish politics, and deep dives into research questions. In the next chapter, the thesis examines various related works, asking similar questions and analyzing their results. After that, the thesis explains the Twitter dataset and used methodologies while collecting and analyzing the data. Next, the thesis deep dives into the analysis results, and later discusses the findings by interpreting them, highlighting both the limitations and future work. The final section summarizes the results and its implications.

1.1 Background

It is crucial to examine Turkey's historical political context to understand the complex political landscape and the May 2023 elections.

After the collapse of the Ottoman Empire, the Turkish Republic was declared in 1923. Some attempts were made, but the first multi-party elections were held in 1946. Until 1945, the Republican People's Party (CHP) was the only party in the parliament, and until 1950 it was the ruling party. The CHP was founded by Mustafa Kemal Atatürk, also the founder of the Turkish Republic.

With a multi-party system in a young republic, political power was now open to various groups. Different and new ideologies arose and started to organize politically (Rabasa & Larrabee, 2008). The military saw their role as the protector of the Republic and Atatürk's ideologies and overthrew the governments in 1960, 1971, and 1980. The 1980 military coup, which introduced a new constitution, was after a period of political fragmentation and civil instability in the 1970s.

During the 1970s, political Islamism started to emerge, which challenged the secularist nationalism and modernization ideologies of the CHP (Yilmaz & Bashirov, 2018). Changes in the political structure, the constitution, and civil liberties, major economic crises in 1994 and 2001 (Ardan, 2023) contributed to Islamic political groups' political influence and strength, to the emergence of new political players and parties like the Justice and Development Party (AKP) (Rabasa & Larrabee, 2008).

Since 2002, AKP has been in power in Turkey. Out of 15 elections, AKP just lost the local elections in 2019, in which the opposition coalition won more than four significant municipalities. Especially in Istanbul, the opposition won twice because the first election was canceled. For the May 2023 elections, the main opposition coalition was established from CHP, Good Party (IYIP), Felicity Party (SAADET), Democrat Party (DP), and two new parties were established out of AKP: Democracy and Progress Party (DEVA) and Future Party (GP) (Atila, 2022). Even though most of the polls favored the opposition in the May 2023 elections (Saç & Çoban, 2023), AKP has won the majority of the parliament and Recep Tayyip Erdogan was elected in the kickoff elections for the third time as president, after serving two terms as president and two terms as prime minister since 2003.

1.2 Research Questions

This section introduces the research questions guiding this thesis, which are based on qualitative methods to analyze the Twitter discourse surrounding the May 2023 elections in Turkey.

The research questions are divided into two parts. The first part will cover the main research objective of this thesis, which is the analysis of the topic modeling results. The first question is as follows: "What were the most prevalent topics in Turkish Twitter discussions during the May 2023 elections?". This question is necessary to understand the main topics of the May 2023 elections discussed in social media.

The next question is "How do real-life events during the election period correlate with shifts in discussion topics on Twitter, and in what ways do these shifts mirror political movements?". This question focuses on the reflection of real-life events and political movements in Twitter discussions.

The third question is about parties and their election agendas: "How do the Twitter discussions about the ruling party and the opposition during the election lead-up reflect and compare to their respective election agendas and public statements?". This question is essential to understand the reflection of the election agendas of the parties and the differences between them on Twitter.

With these questions in mind, the second part of the research questions covers the comparison of the results of the topic modeling with other research, where a similar approach was used for different countries. The main question is as follows: "How do the key themes, content, and engagement levels in the Turkish Twitter discourse surrounding the May 2023 elections compare with those observed in the past elections in other countries?".

2 Related Work

The recent advances in Natural Language Processing (NLP) and easy access to open-source models allow researchers to study text data by performing sentiment and emotional analysis, topic modeling, semantic search, and many more. Large language models like ChatGPT by OpenAI considerably explain how fast the NLP field develops.

In this thesis, topic modeling is performed on massive text data. Topic modeling is an unsupervised tool that helps extract the underlying themes from the given text data. There are several topic modeling approaches, and this thesis focuses on neural topic modeling. Unlike conventional models like Latent Dirichlet Allocation (LDA), a generative probabilistic model (Blei et al., 2003), neural topic models have been used in important NLP tasks, including text generation, document summarisation, and translation, fields to which conventional topic models are complex to apply (Zhao et al., 2021). This thesis uses the neural topic model BERTopic, introduced by Grootendorst (2022), which is explained in detail in the following chapters.

A tremendous number of studies have applied topic modeling in their research. In the political science field, Ilyas et al. (2020) performed topic modeling using LDA to evaluate Brexit's impact in the UK. Kaiser et al. (2020) used a structural topic model (STM), similar to LDA, to analyze the right media coverage during the 2016 US elections, while Anwar et al. (2021) performed topic modeling using BERT on Twitter data for 2020 US elections. Gritto (2022) applied BERTopic on Twitter data from German politicians and analyzed its results. Contreras et al. (2022) used both LDA and BERTopic on a Panamanian parliamentary proceedings, which are Spanish.

3 Experiments

3.1 The Dataset

Citation test (Lamport, 1994).

3.2 The Methodology

x

4 Results

4.1 Analysis of data findings

Citation test (Lamport, 1994).

5 Discussion

x

5.1 Limitations

Citation test (Lamport, 1994).

5.2 Future Work

Citation test (Lamport, 1994).

6 Conclusion

6.1 Section

Citation test (Lamport, 1994).

Acronyms must be added in `main.tex` and are referenced using macros. The first occurrence is automatically replaced with the long version of the acronym, while all subsequent usages use the abbreviation.

E.g. `\ac{TUM}, \ac{TUM}` ⇒ Technical University of Munich (TUM), TUM

For more details, see the documentation of the `acronym` package[1].

6.1.1 Subsection

See Table 6.1, Figure 6.1, Figure 6.2, Figure 6.3.

Table 6.1: An example for a simple table.

A	B	C	D
1	2	1	2
2	3	2	3

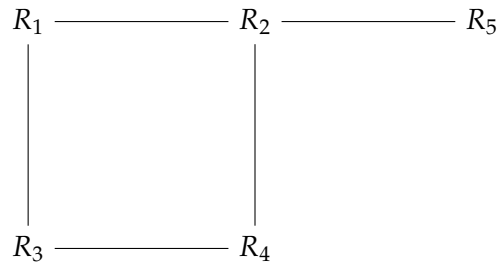

Figure 6.1: An example for a simple drawing.

[1] https://ctan.org/pkg/acronym

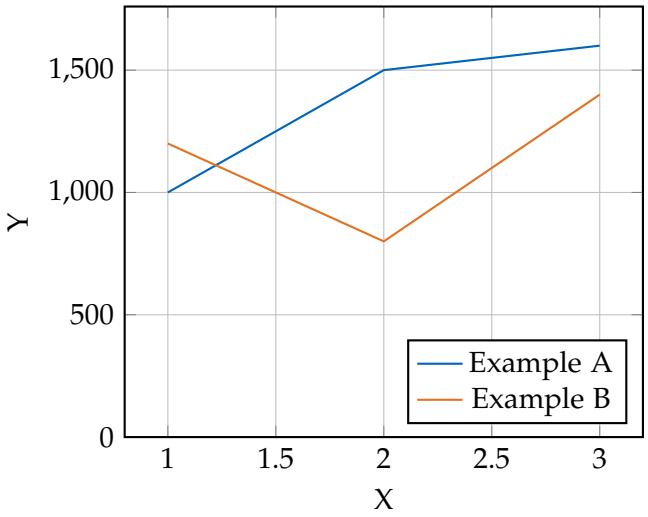

Figure 6.2: An example for a simple plot.

```
SELECT * FROM tbl WHERE tbl.str = "str"
```

Figure 6.3: An example for a source code listing.

Abbreviations

TUM Technical University of Munich

CHP Republican People's Party

AKP Justice and Development Party

DEVA Democracy and Progress Party

IYIP Good Party

SAADET Felicity Party

DP Democrat Party

DEVA Democracy and Progress Party

GP Future Party

NLP Natural Language Processing

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Bibliography

Anwar, A., Ilyas, H., Yaqub, U., & Zaman, S. (2021). Analyzing QAnon on twitter in context of US elections 2020: Analysis of user messages and profiles using VADER and BERT topic modeling. *DG.O2021: The 22nd Annual International Conference on Digital Government Research*, 82–88. https://doi.org/10.1145/3463677.3463718

Ardan, M. (2023). 1994 Financial Crisis in Turkey. In B. Açıkgöz (Ed.), *Black Swan: Economic Crises, Volume II* (pp. 95–126). Springer Nature. https://doi.org/10.1007/978-981-99-2318-2_7

Atila, S. (2022). 3 kasım 2002'den bugüne akp ve erdoğan'ın 20 yıllık seçim tarihi.

Blei, D. M., Ng, A. Y., & Jordan, M. I. (2003). Latent dirichlet allocation. *Journal of Machine Learning Research*, *3*, 993–1022. https://doi.org/10.5555/944919.944937

Contreras, K., Verbel, G., Sanchez, J., & Sanchez-Galan, J. E. (2022). Using topic modelling for analyzing panamanian parliamentary proceedings with neural and statistical methods. *2022 IEEE 40th Central America and Panama Convention (CONCAPAN)*, 1–6. https://doi.org/10.1109/CONCAPAN48024.2022.9997766

Gritto, A. (2022). *Application of neural topic models to twitter data from German politicians* (bat). Ludwig-Maximilians-Universität München. https://doi.org/10.5282/ubm/epub.92617

Grootendorst, M. (2022). BERTopic: Neural topic modeling with a class-based TF-IDF procedure.

Ilyas, S. H. W., Soomro, Z. T., Anwar, A., Shahzad, H., & Yaqub, U. (2020). Analyzing brexit's impact using sentiment analysis and topic modeling on twitter discussion. *The 21st Annual International Conference on Digital Government Research*, 1–6. https://doi.org/10.1145/3396956.3396973

Kaiser, J., Rauchfleisch, A., & Bourassa, N. (2020). Connecting the (far-)right dots: A topic modeling and hyperlink analysis of (far-)right media coverage during the US elections 2016 [Publisher: Routledge _eprint: https://doi.org/10.1080/21670811.2019.1682629]. *Digital Journalism*, *8*(3), 422–441. https://doi.org/10.1080/21670811.2019.1682629

Lamport, L. (1994). *Latex : A documentation preparation system user's guide and reference manual*. Addison-Wesley Professional.

Mejova, Y., Weber, I., & Macy, M. W. (Eds.). (2015). *Twitter: A digital socioscope*. Cambridge University Press. https://doi.org/10.1017/CBO9781316182635

Najafi, A., Mugurtay, N., Demirci, E., Demirkiran, S., Karadeniz, H. A., & Varol, O. (2022). #Secim2023: First Public Dataset for Studying Turkish General Election.

Ogan, C., & Varol, O. (2017). What is gained and what is left to be done when content analysis is added to network analysis in the study of a social movement: Twitter use during gezi park. *Information, Communication & Society*, *20*(8), 1220–1238. https://doi.org/10.1080/1369118X.2016.1229006

Pfeffer, J., Matter, D., Jaidka, K., Varol, O., Mashhadi, A., Lasser, J., Assenmacher, D., Wu, S., Yang, D., Brantner, C., Romero, D. M., Otterbacher, J., Schwemmer, C., Joseph, K., Garcia, D., & Morstatter, F. (2023, April 11). Just another day on twitter: A complete 24 hours of twitter data.

Rabasa, A., & Larrabee, F. S. (2008). *The Rise of Political Islam in Turkey* (1st ed.). RAND Corporation.

Saç, E., & Çoban, T. (2023). Seçim sonuçlarından geriye bakmak: Anketler neden, nasıl yanıldı?

Theocharis, Y., Barberá, P., Fazekas, Z., & Popa, S. A. (2020). The dynamics of political incivility on twitter. *SAGE Open*, *10*(2), 2158244020919447. https://doi.org/10.1177/2158244020919447

Uysal, N., & Schroeder, J. (2019). Turkey's twitter public diplomacy: Towards a "new" cult of personality. *Public Relations Review*, *45*(5), 101837. https://doi.org/10.1016/j.pubrev.2019.101837

Yerlikaya, T., & Toker, S. (2020). Social media and fake news in the post-truth era: The manipulation of politics in the election process. *Insight Turkey*, 177–196. https://doi.org/10.25253/99.2020222.11

Yilmaz, I., & Bashirov, G. (2018). The AKP after 15 years: Emergence of erdoganism in turkey [Publisher: Routledge _eprint: https://doi.org/10.1080/01436597.2018.1447371]. *Third World Quarterly*, *39*(9), 1812–1830. https://doi.org/10.1080/01436597.2018.1447371

Zaharna, R. S., & Uysal, N. (2016). Going for the jugular in public diplomacy: How adversarial publics using social media are challenging state legitimacy. *Public Relations Review*, *42*(1), 109–119. https://doi.org/10.1016/j.pubrev.2015.07.006

Zhao, H., Phung, D., Huynh, V., Jin, Y., Du, L., & Buntine, W. (2021, February 28). Topic modelling meets deep neural networks: A survey. https://doi.org/10.48550/arXiv.2103.00498