

COVID-19 Case Prediction using Emotion Trends via Twitter Emoji Analysis

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Overview

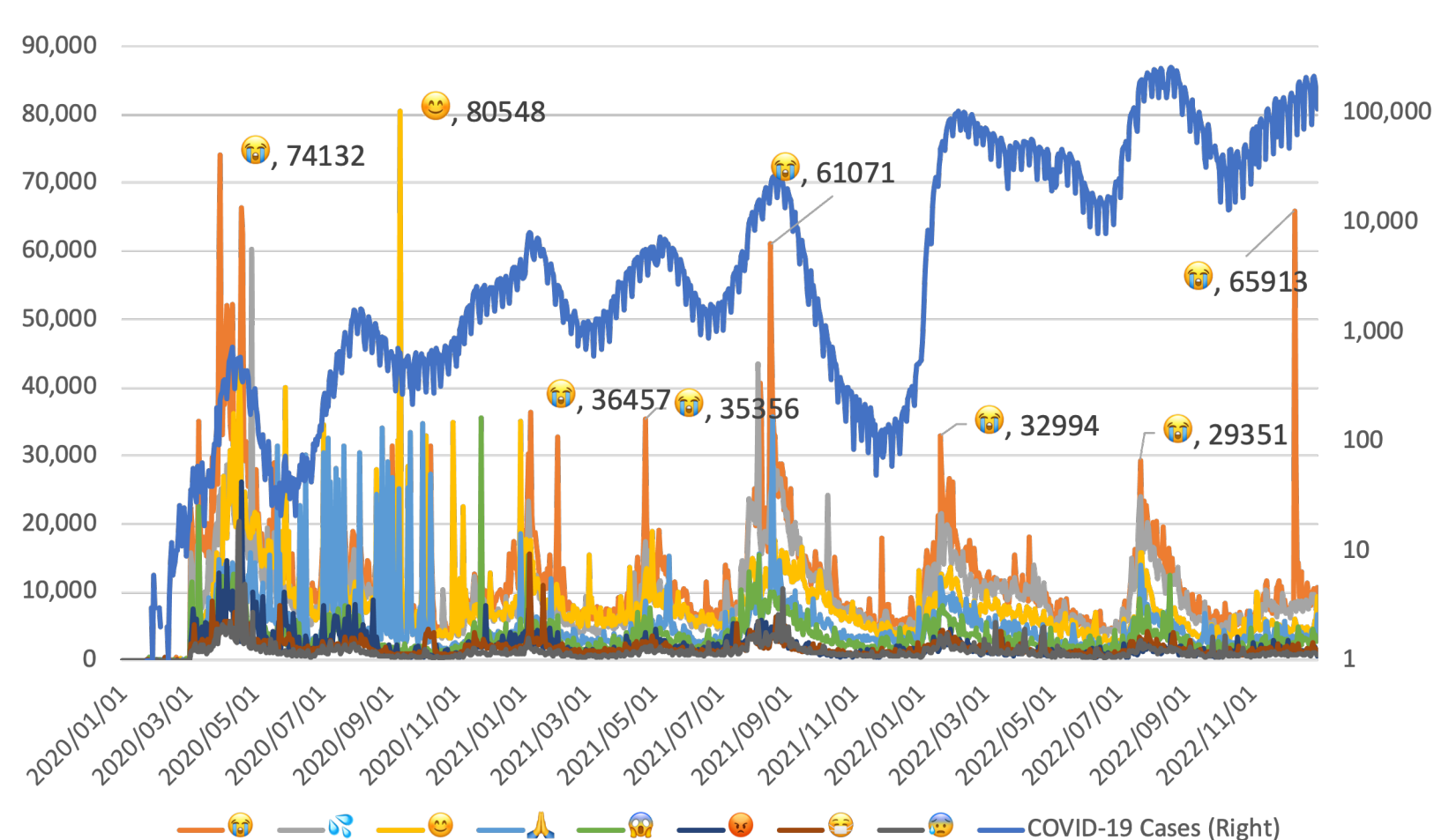
In a case study in Japan, we attempt to determine whether the trend of emotions toward COVID-19 expressed on social media, specifically Twitter, can be used to enhance COVID-19 case prediction system performance. We use emoji as a proxy to shallowly capture the trend in emotion expression on Twitter. Our experimental results show that utilizing emoji improved system performance in most evaluations. Our results can be found here:

Vu Tran, and Tomoko Matsui. "COVID-19 case prediction using emotion trends via Twitter emoji analysis: A case study in Japan." *Frontiers in Public Health* 11 (2023).

Approach

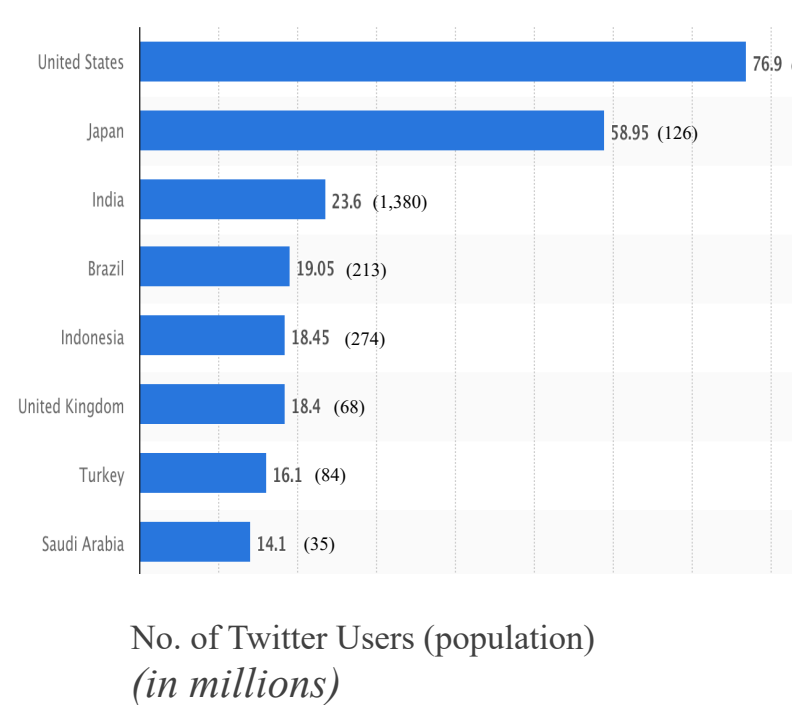
- ❑ Analyzing emotional social media reactions via emoji on the spreading of COVID-19 related information.
- ❑ Capturing the relationship between the emotional social media reactions and the COVID-19 epidemic progression.
- ❑ Utilizing machine learning to predict daily cases of COVID-19.

Data



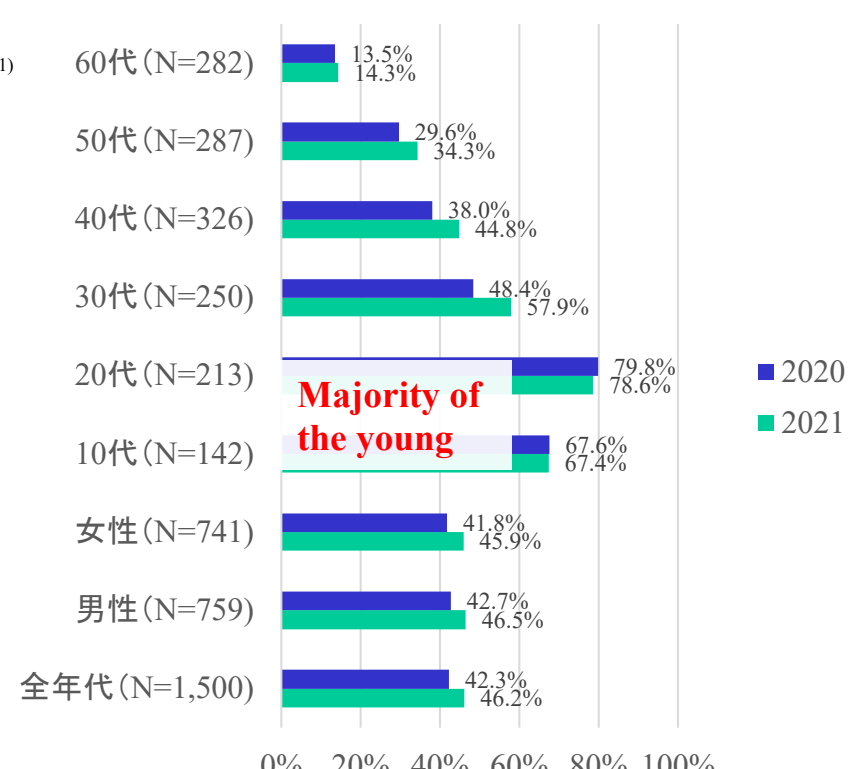
COVID-19 Related Tweets by Emoji

47% Japan's population using Twitter



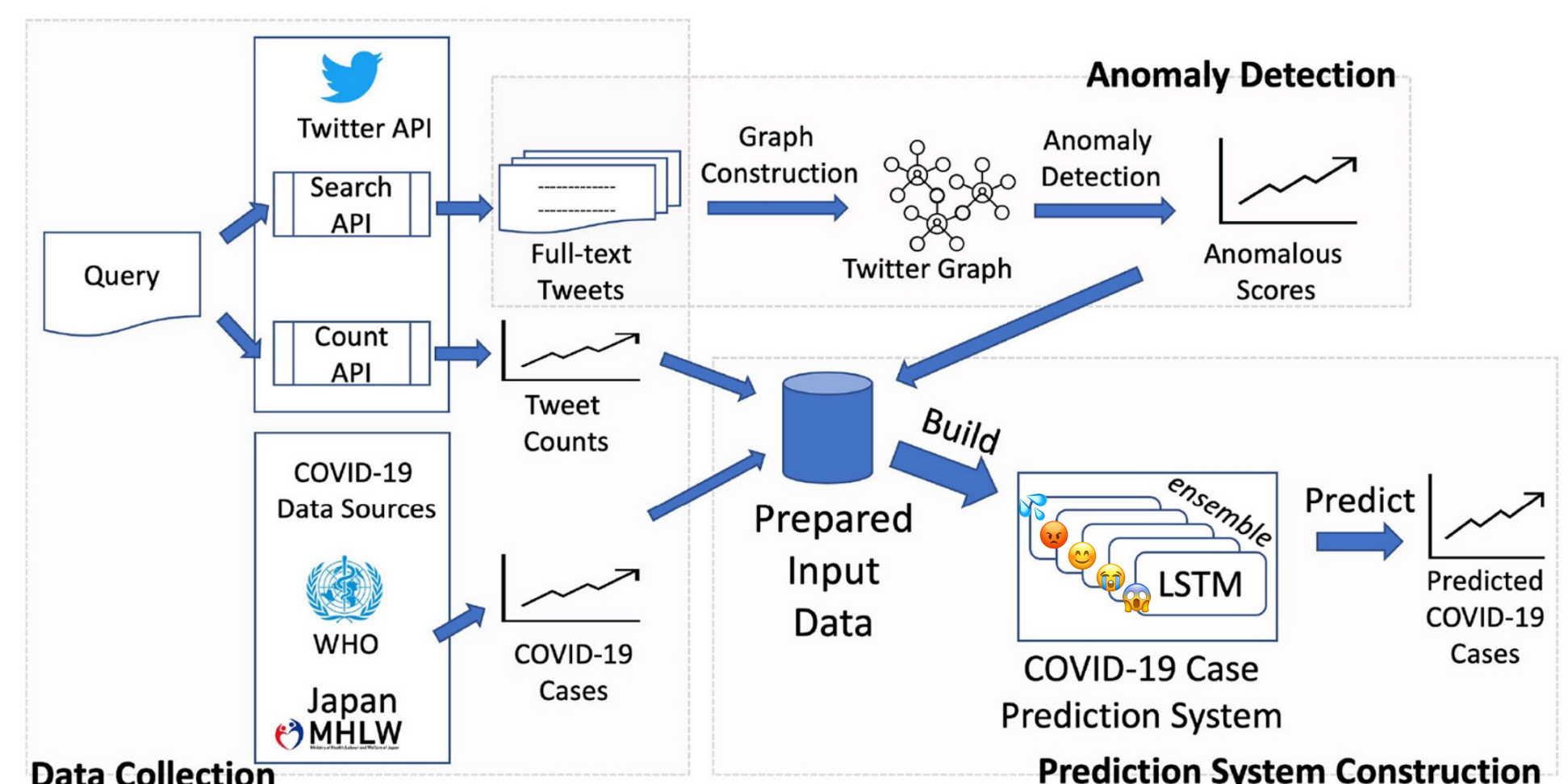
Source:
No. Twitter Users: statista.com (Jan 2022)
Population: worldometers.info (2023)

Twitter Usage in Japan

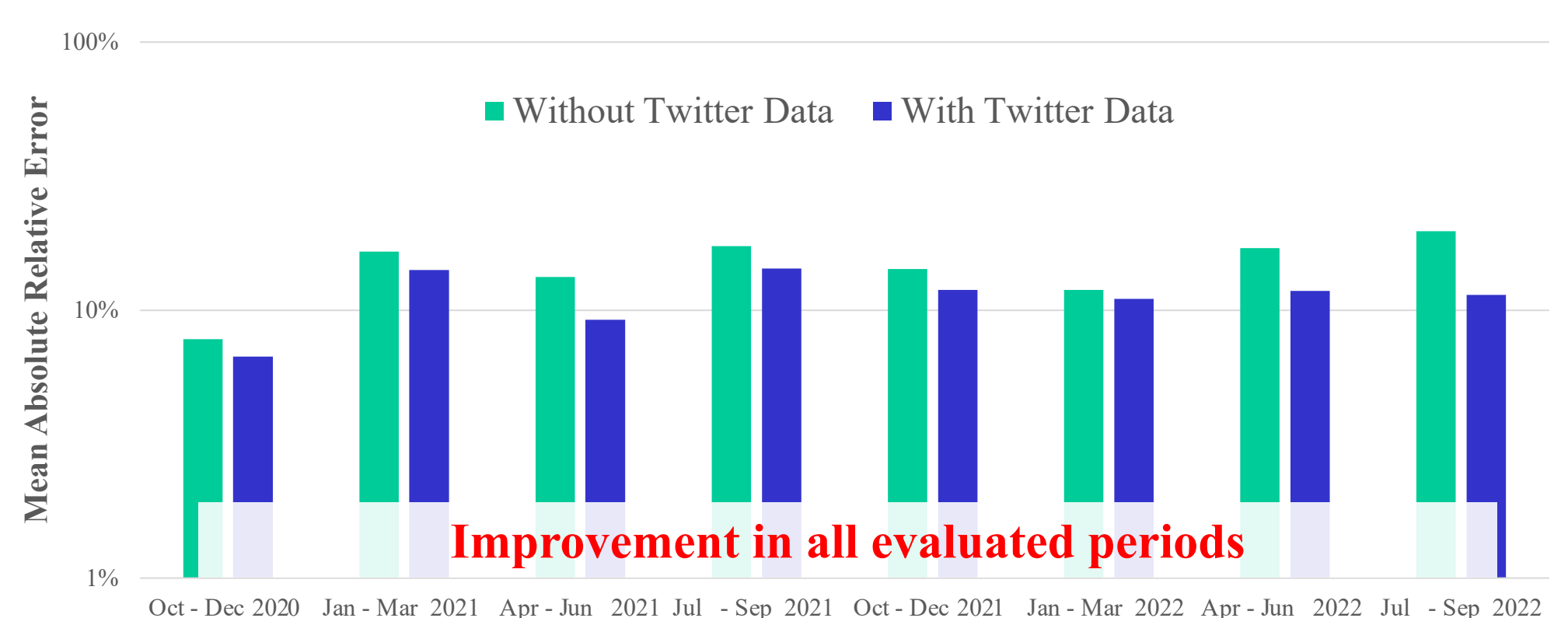


Source: 総務省 www.soumu.go.jp

Framework



Performance



On predictions of 7 days ahead

Conclusion & Future Direction

- ✓ Emotional social media reactions with emoji have relationships with the progression of COVID-19 cases.
- ✓ It is possible to capture the relationships by a machine learning model and yield a promising prediction performance.
- ❑ Challenges remain in the complexity of the evolution of the COVID-19 and the corresponding social media reactions.
- ❑ Several expansions to consider are deep emotion analysis, multi-topic coverage, and social media cross-platform aggregation.