

The document presents "Tweets2Stance" (T2S), an unsupervised framework for detecting users' stances on Twitter towards social-political statements without the need for topic-aligned training data. The framework operates on zero-shot learning, leveraging pre-trained Natural Language Inference (NLI) models to infer five-level stances (completely disagree to completely agree) by analyzing users' Twitter timelines. T2S's ground truth data is sourced from Voting Advice Applications (VAAs), and its performance is evaluated across nine datasets from different political elections between 2019 and 2021. The study introduces a novel approach to stance detection that does not require training data or user behavior analysis, focusing solely on text content. T2S outperforms baseline models and demonstrates the ability to generalize across various political contexts, as evidenced by its performance metrics (F1 and MAE scores). The framework's adaptability is highlighted by its effectiveness in different political scenarios, and the authors provide labeled datasets to aid further research.

The methodology section details the framework's components, including Topic Filtering and Agreement Detector modules, and the parameters optimized during experiments. The Topic Filtering module uses a Zero-Shot Classifier (ZSC) to identify tweets relevant to a given topic, while the Agreement Detector module determines the user's stance level. The framework's performance is evaluated against baselines and assessed using F1 and MAE metrics.

Results indicate that T2S effectively detects stances across diverse political contexts, albeit with varying performance due to factors like topic knowledge of language models and users' social media expression. The framework's generalizability is demonstrated by identifying optimal settings that perform well across multiple elections, suggesting that a general framework can be applied to different political contexts.

The document concludes by acknowledging the potential and limitations of T2S, including its application to other topics and social media platforms, the challenges of domain adaptation and data bias, and the need for advanced language models to improve performance. Future work may explore the use of models like GPT-4 or ChatGPT to enhance the framework's capabilities.