

Popularity Prediction of Online Petitions using a Multimodal Deep Regression Model

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Motivation

A **petition** is a formal request for change or an action to any authority, co-signed by a group of supporters

"Target the task of predicting petition popularity at the time of submission because its useful for users"

- Only text-based models have been proposed
- We propose a multi-modal approach (text, image, and metadata)

Model

text-only

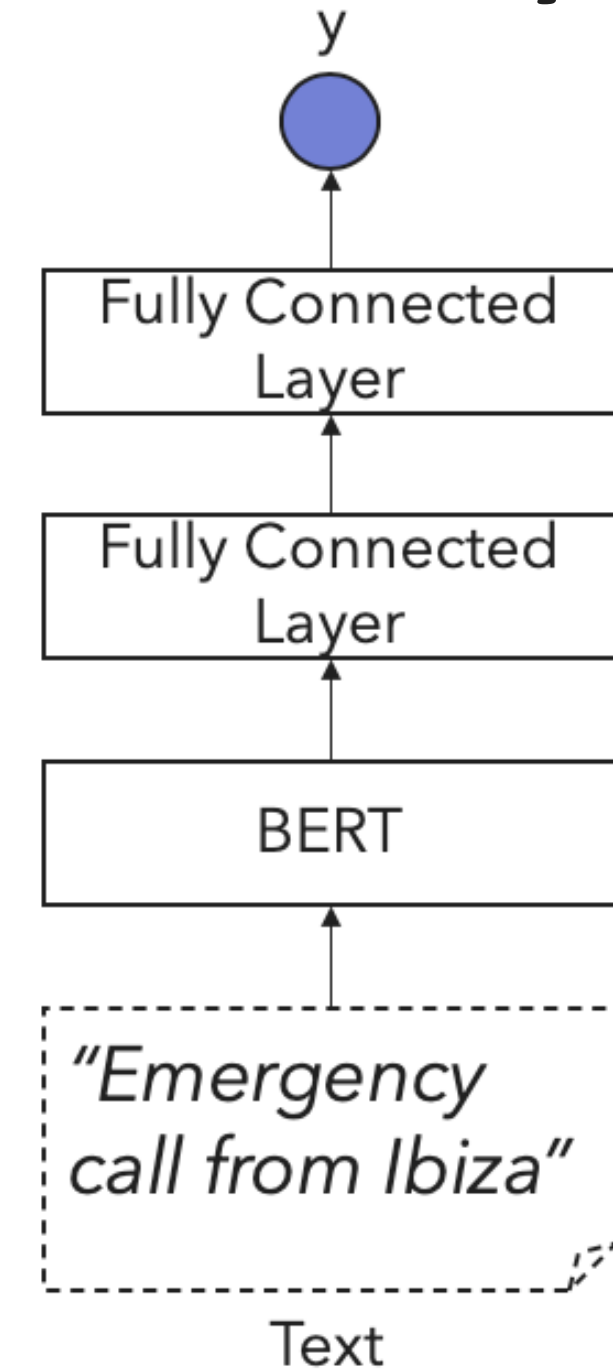
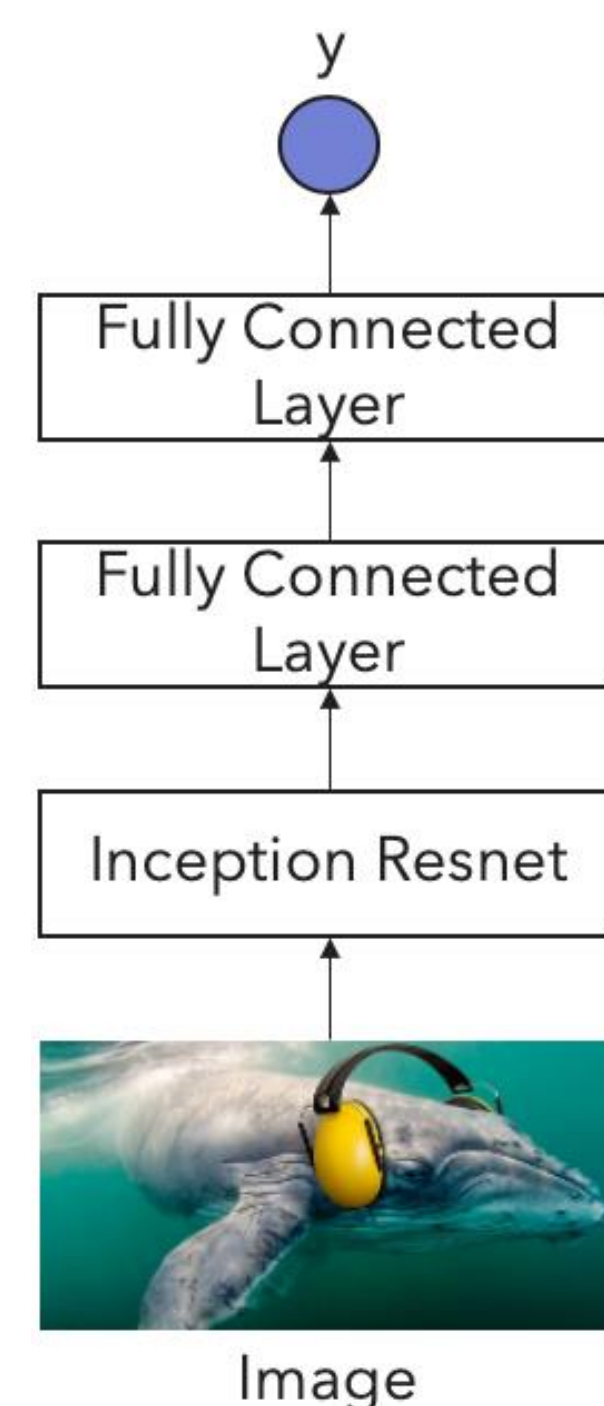
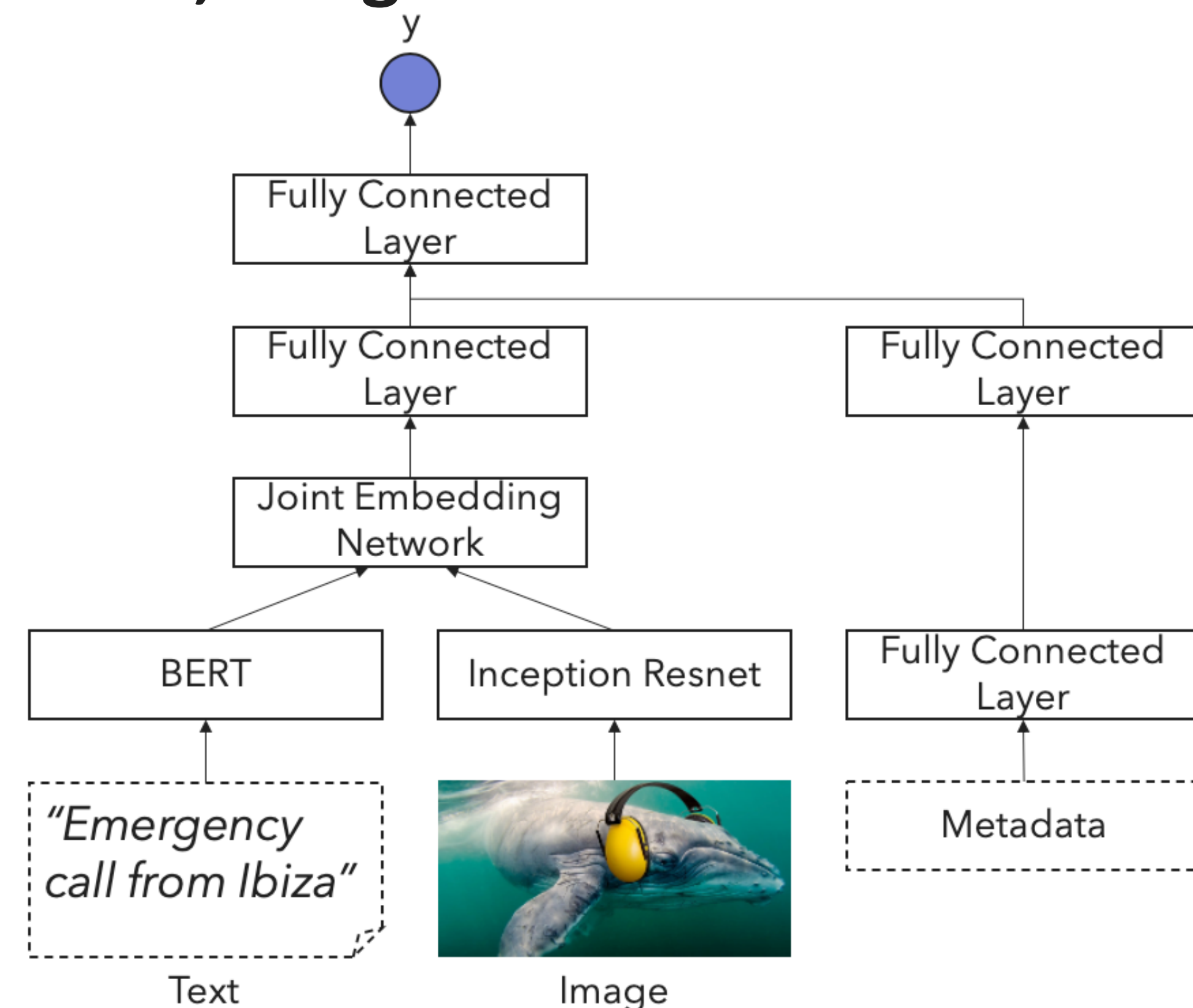


image-only



combined text, image and meta-data



Data source

Text, Image and Country data from Avaaz.org



Contributions

- A multimodal regression approach for petition popularity prediction task using *text, image and meta features*
- Experiments using both mono-and multi-lingual petitions
- Developed a novel multimodal, multilingual dataset

Loss functions

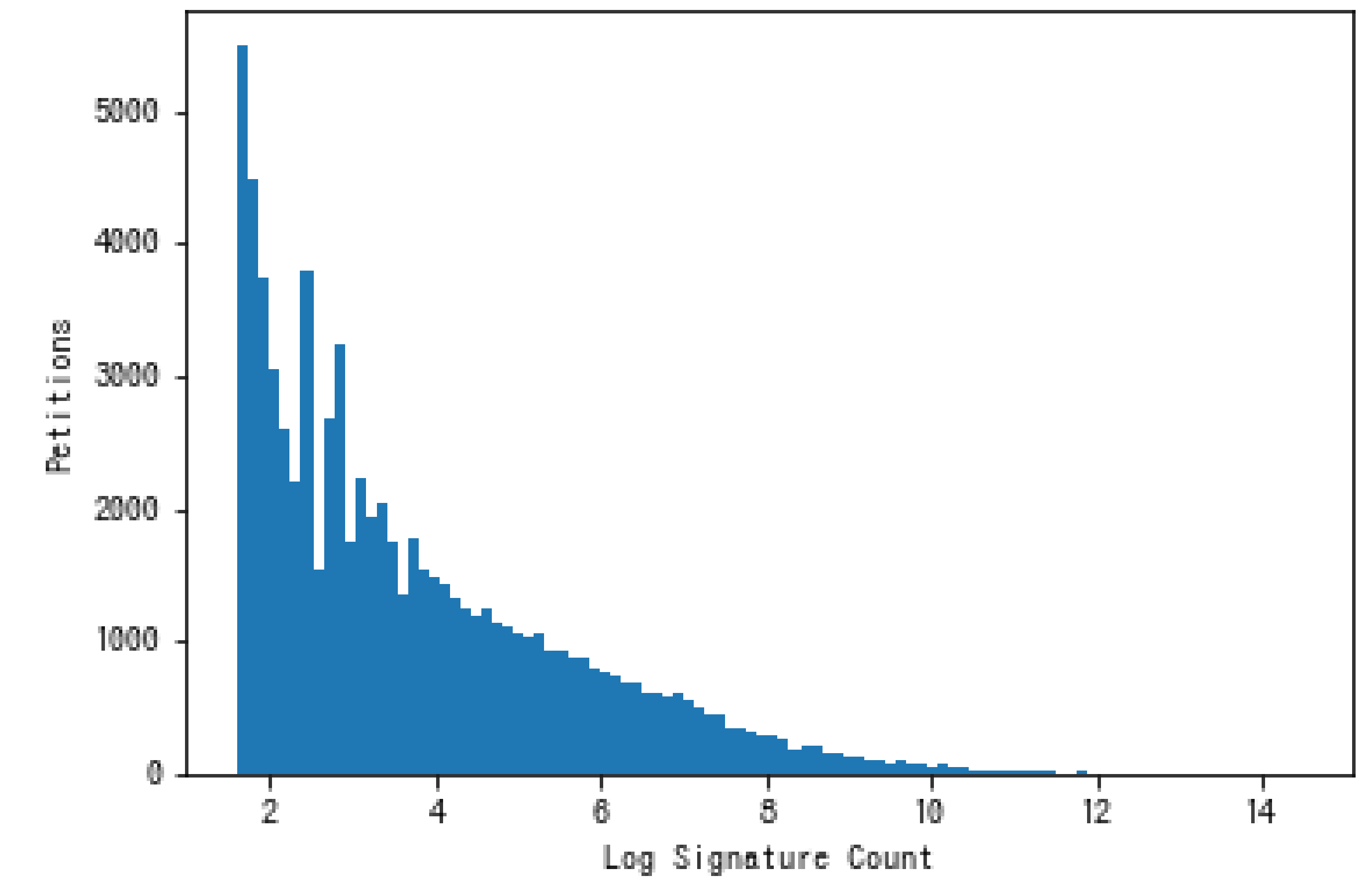
msle

$$\frac{1}{N} \sum_{i=1}^N (\log(y_i + 1) - \log(\hat{y}_i + 1))^2$$

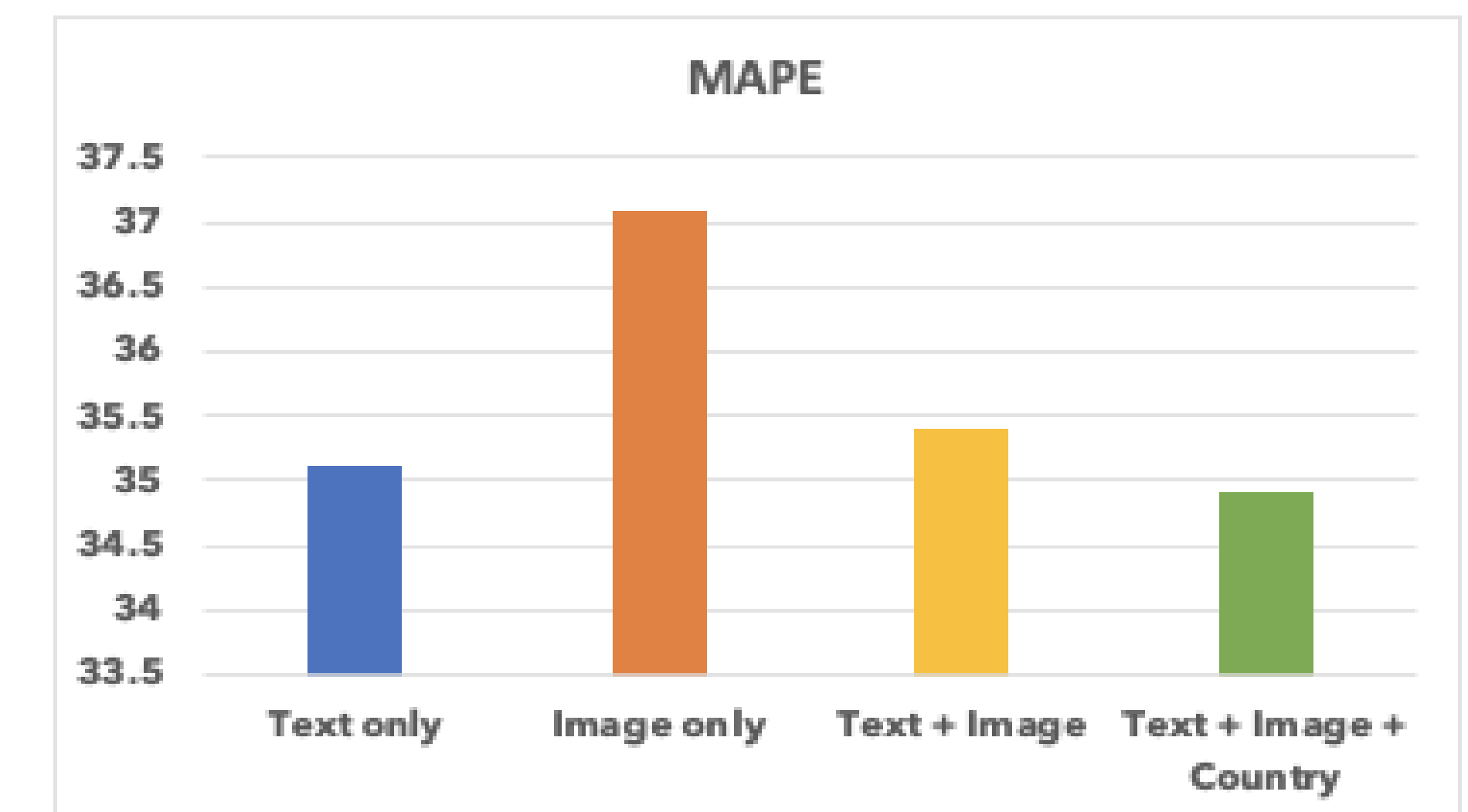
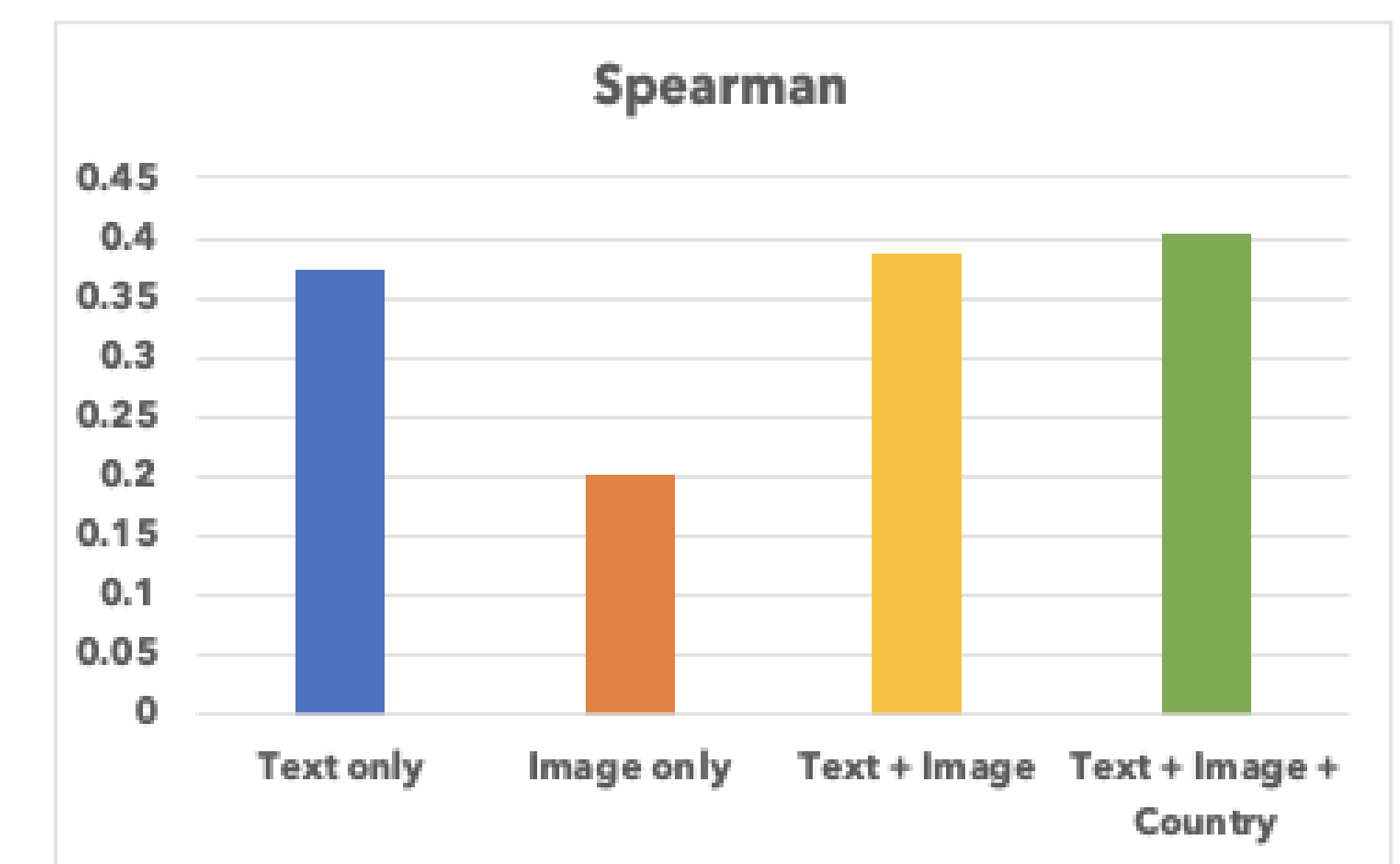
msle + mape

$$\frac{1}{N} \sum_{i=1}^N (\log(y_i + 1) - \log(\hat{y}_i + 1))^2 + k \times 100 \times \frac{1}{N} \sum_{i=1}^N \left| \frac{\log(y_i + 1) - \log(\hat{y}_i + 1)}{\log(y_i + 1)} \right|$$

Data Distribution



Result



Future Work

- Exploring further choices of metadata
- Consider alternate ways to model multilingual text