

Overcoming **Language Disparity** in Online Content Classification with **Multimodal Learning**

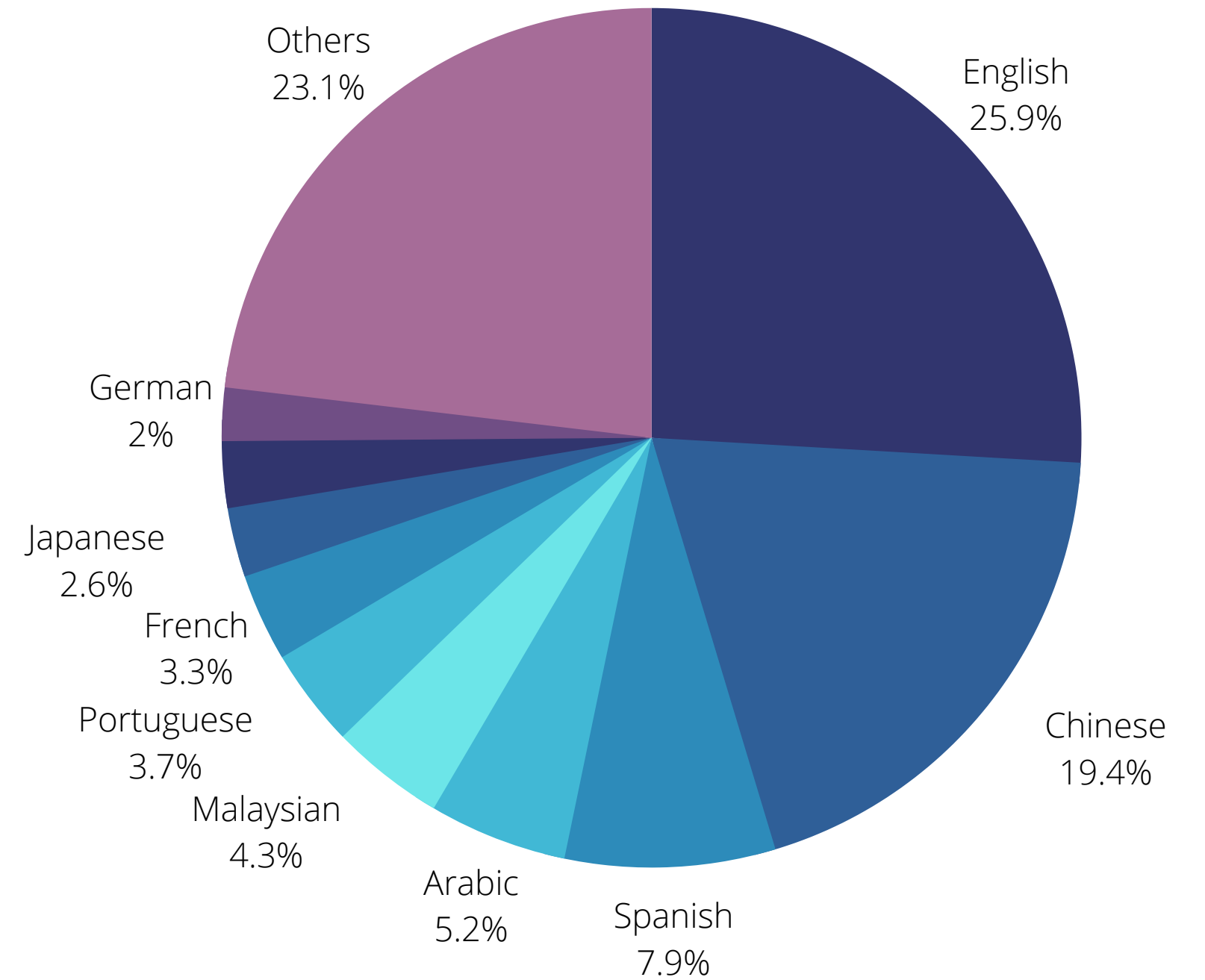
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Munmun De Choudhury, and Srijan Kumar



User-generated online content



Societal discourses
Personal ideologies
Global events



January 2020; Statista:
<https://www.statista.com/statistics/262946/share-of-the-most-common-languages-on-the-internet/>

LARGE LANGUAGE MODELS

BERT (0.34 B) & mBERT

T5 (11 B) & mT5

...

Can be **fine-tuned** for specific **social computing** tasks

Research Questions



Does the adoption of *large language models* for social computing tasks lead to a *disparity in performance* across *English* and *non-English* languages?



Can the inclusion of images with *multimodal learning* help in *bridging the gap* between *English* and *non-English* languages?



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Large language models:

- monolingual BERTs
- multilingual BERTs

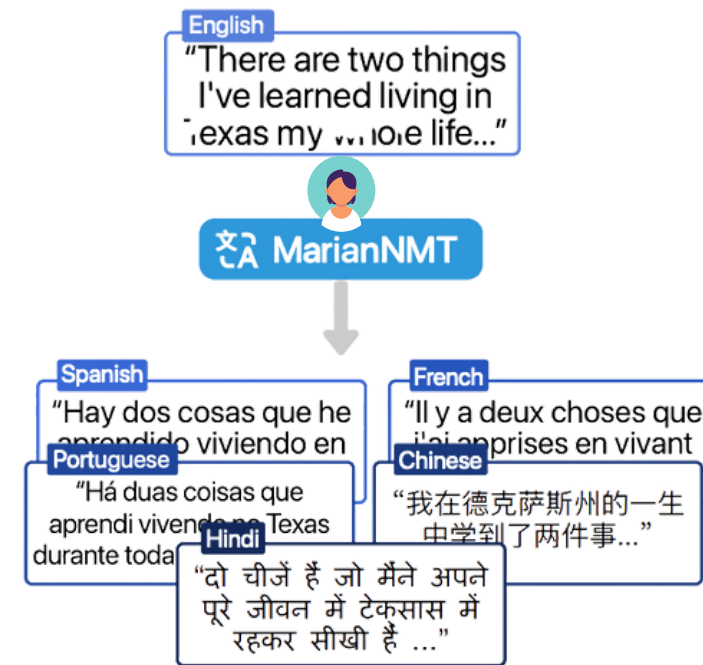
Non-English languages:

- Spanish (es)
- French (fr)
- Portuguese (pt)
- Chinese (zh)
- Hindi (hi)

Social computing tasks:

- Crisis humanitarianism detection
- Fake news detection
- Emotion detection

(Alam et al., 2018; Shu et al., 2017; 2018; Duong et al., 2017)



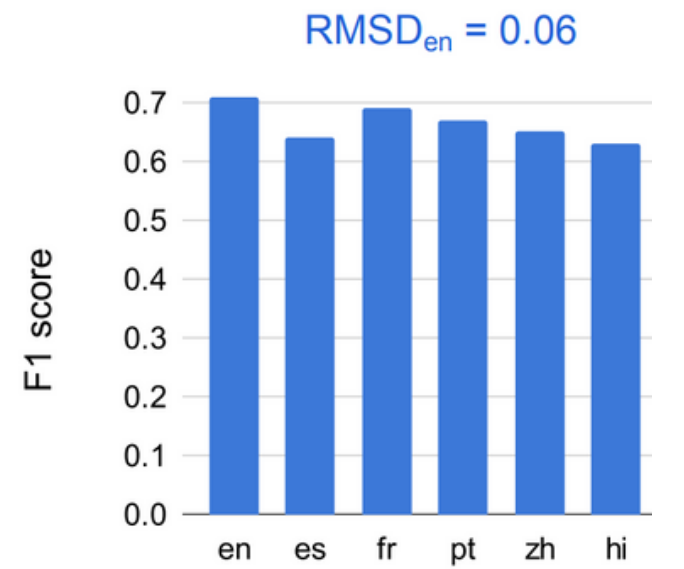
A Crisis Humanitarianism		B Fake News Detection		C Emotion Detection	
Individual	Rescue	Fake	Real	Creepy	Rage
Family mourns 11 dead after church falls at baptism during Mexico earthquake.	Blood donation lines in Tehran to help earthquake survivors in west of Iran.	Prince William may not attend wedding leaving Harry without a best man.	Selena Gomez says she'll protect her children like no one's business.	If you believe in life after death trespass here...	Someone have been throwing these into water near my home.

Human-translated evaluation set is publicly available!



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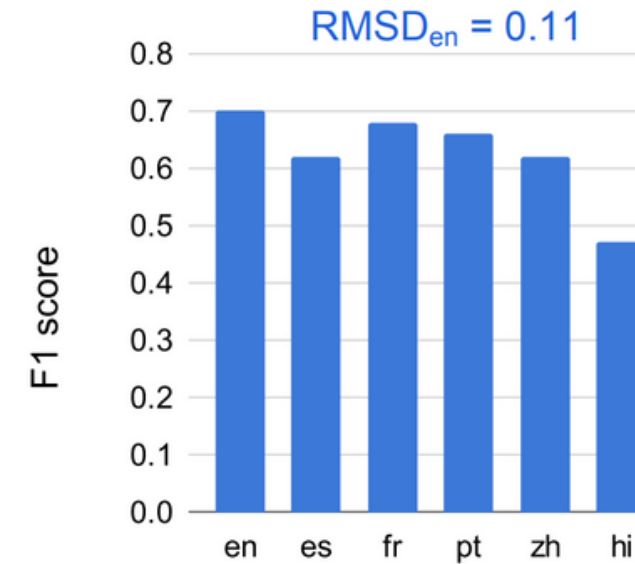
monolingual BERTs



Text-only (monolingual)

Crisis humanitarianism

multilingual BERTs



Text-only (multilingual)

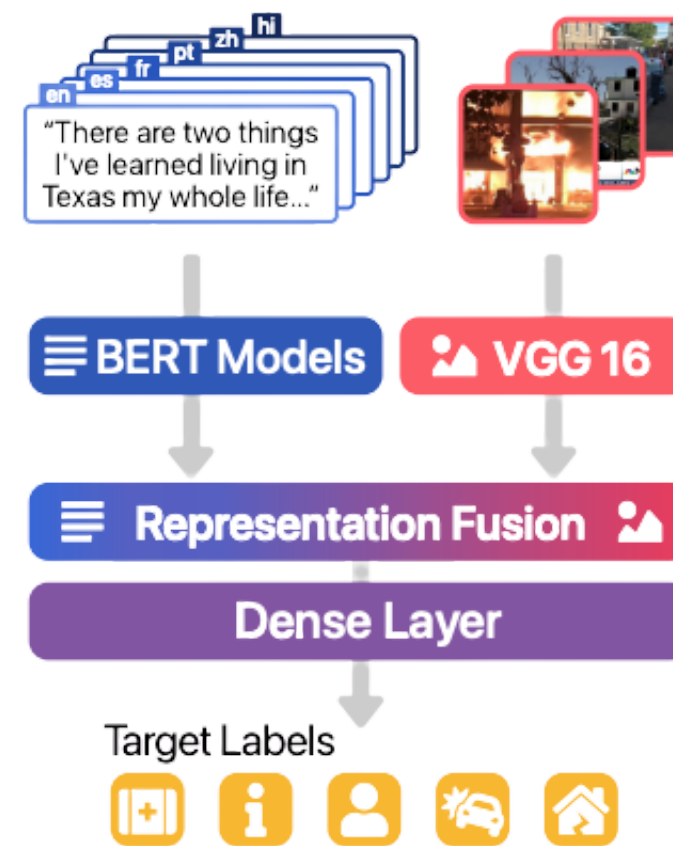
Crisis humanitarianism

Same trends on fake news and emotion detection tasks!

Please refer to the paper for details.



Can the inclusion of images with *multimodal learning* help in *bridging the gap* between *English* and *non-English* languages?

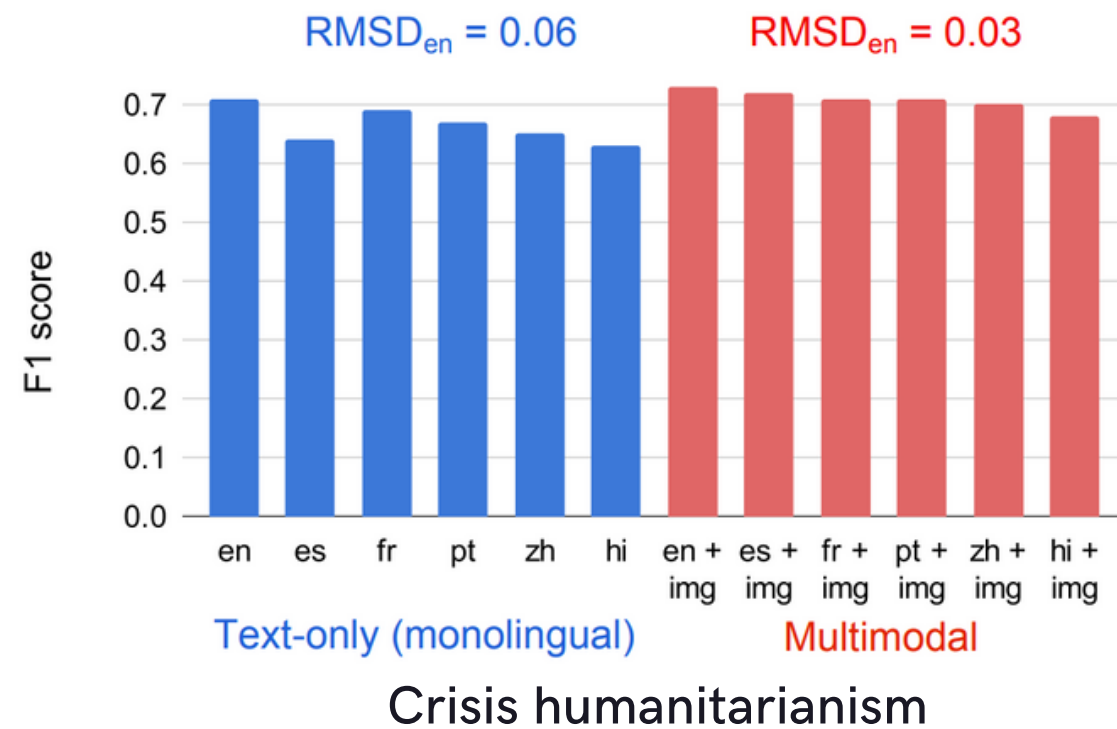


Fusion-based Multimodal Learning

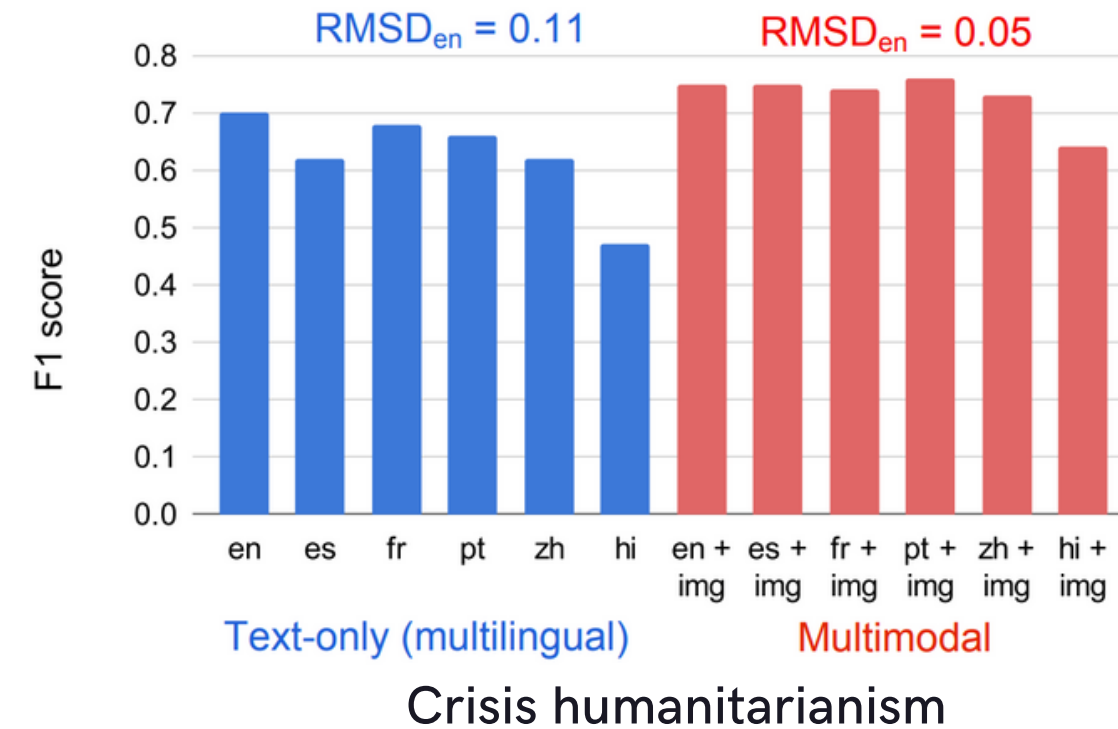


Can the inclusion of images with *multimodal learning* help in bridging the gap between *English* and *non-English* languages?

monolingual BERTs



multilingual BERTs



*Same trends on fake news and emotion detection tasks!
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The lens of new modalities

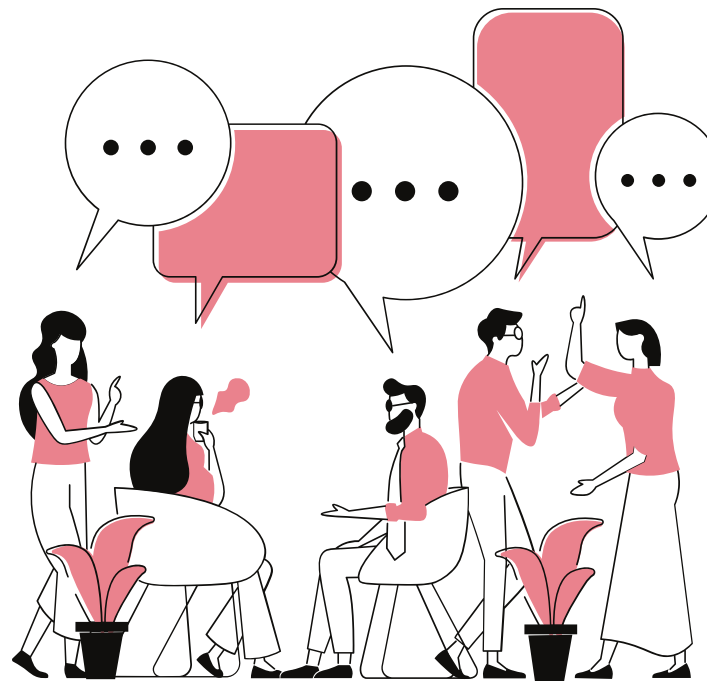
Ongoing improvements in **large language models** for better **non-English** modeling

can benefit from

the **complementary gains** in performance that come from jointly leveraging the **visual modality**.

Session 5: ML models and LLMs

Wednesday, June 8 | *05:15 pm ET*



Please reach out to discuss this work!

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<https://gaurav22verma.github.io/>

Project Webpage: <https://multimodality-language-disparity.github.io/>

