

Artificial Intelligence Approach To Improve Social Media Images Classification For Crisis Response

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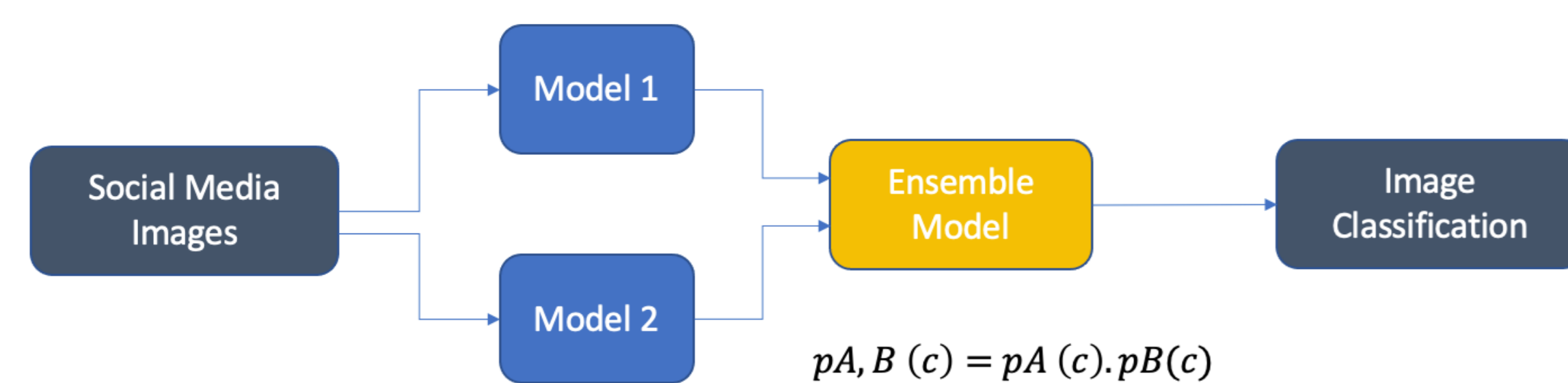
Introduction

Images generated from social media users come up with two challenges : (i) Volume of data (ii) Inherent complexity to analyze (iii) Irrelevant with the topics



Social media images generated by users

Method



Schematic diagram of experiment methodology

To evaluate the model, we use CrisisMMD dataset.

The dataset consists of two tasks :

- (i) Informativeness : Binary classification
- (ii) Humanitarian : Multiclass classification

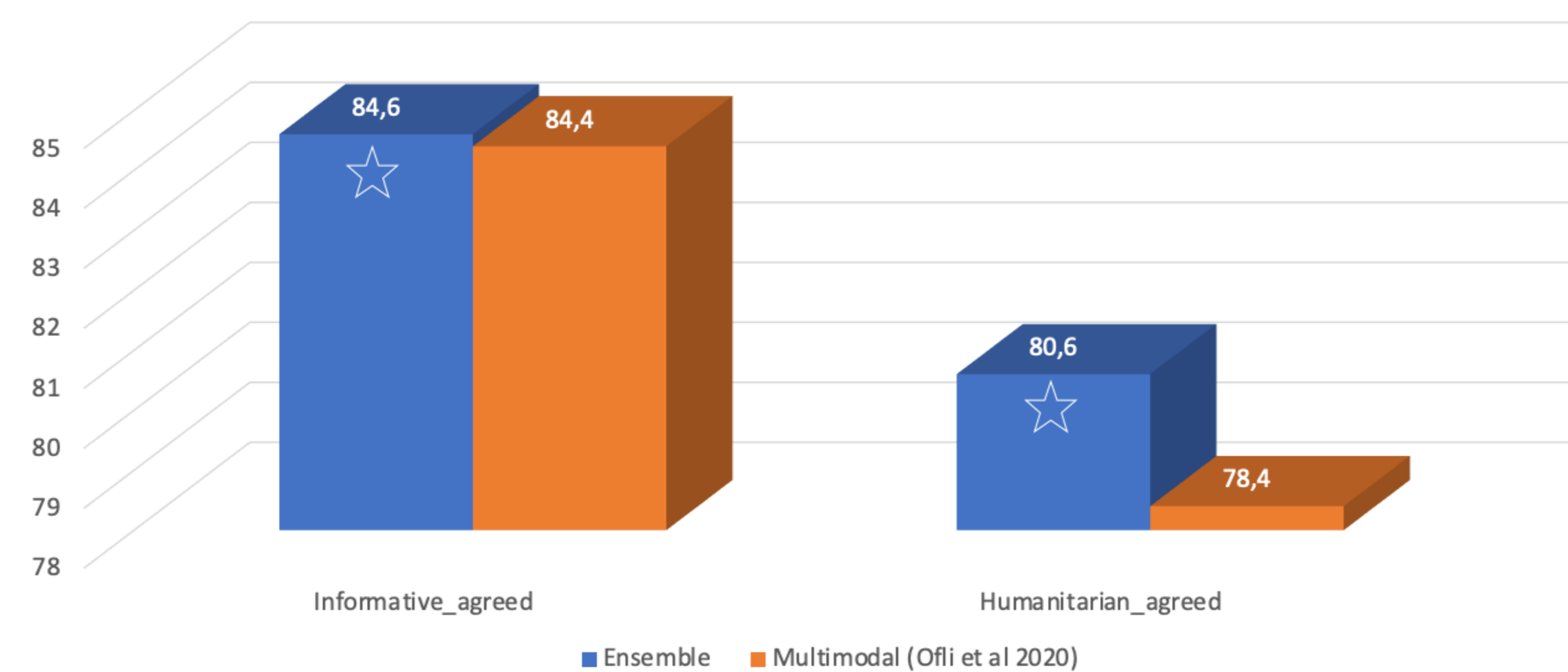
Results

Dataset	VGG16	DenseNet201	MobileNetv2	InceptionV3	ResNet50
informative_agreed	83.246	83.507	81.943	79.791	78.292
humanitarian_agreed	76.126	80.524	76.754	72.356	69.005
damage_all	65.028	66.730	63.516	63.138	61.626
informative_all	78.721	80.823	77.738	74.832	72.150
humanitarian_all	70.228	73.402	70.049	66.026	63.523

Base model accuracy performance in different dataset

Dataset	VGG16	DenseNet201	MobileNetv2	D+V	D+M
informative_agreed	83.246	83.507	81.943	84.615	83.441
humanitarian_agreed	76.126	80.524	76.754	80.314	80.628
damage_all	65.028	66.730	63.516	66.918	66.162
informative_all	78.721	80.823	77.738	81.090	81.448
humanitarian_all	70.228	73.402	70.049	74.117	73.581

Ensemble accuracy performance in various dataset



Accuracy performance comparison of ensemble model with multimodal model

Future Work

The ensemble learning has shown better performance compared to single model. In the future, we are interested to investigate the adaptability of ensemble model performance with unseen dataset

Conclusions

- (i) The ensemble learning produces better accuracy both in binary and multiclass task
- (ii) Compared to multimodal (images+text), a simple average ensemble model demonstrate **better** performance
- (iii) Different task scenario perform **reasonably good** with different settings of pre-trained model

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