Racial Discrimination Detection Using Deep Learning and Machine Learning Techniques in Social Media for Arabic Contents

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Abstract

Recently, the use of the Internet, especially social networking sites such as Twitter and Facebook, has increased; it offers an open area to the world and encourages people to share their feelings, contributing to the growth of negative habits among social networking site users; one of these behaviors is known as Racism Discrimination. Racism is one of the hate speech types that exploit social media; our study aims to classify racism in multi-class Arabic content in social media (Race, Religion, Disabilities, Other) by using two methods: Machine Learning (ML) and Deep Learning (DL) algorithms. Many studies detect the Racism phenomena in the English language. These studies are limited on Arabic language. We used preprocessing tools to handle the Arabic language; we applied three famous NLP techniques (Normalization, Stop Word Removal, and Stemming). Also created datasets for Arabic social media from Twitter and Facebook with approximately 10,319 publications.

We used a famous multiclass classifier in ML; the most famous of them are Support Vector Machine (SVM), Naive Bayes (NB), Decision Tree (J48), and Random Forest (RF), K-Nearest Neighbor (KNN). We evaluated the classifier's accuracy by calculating the F1-Measure, Recall, and Precision measurements**.** On the other hand, we used Deep Learning methods, which contain Convolutional Neural Networks (CNN), Recurrent Neural Networks

(RNN), and Deep Neural Networks (DNN). The feature extraction method that has been used includes Word Embedding (Word2Vector).

The results showed that SVM classifier is given the highest value of F1-Measure for both Twitter dataset with (83.7%) and in Facebook dataset with (77.4%). Using deep learning techniques, we get results better than ML classifier as RNN/LSTM gives the highest value than the other neural network techniques in Twitter dataset, we get the value of F1-measure with (89.97%) and in Facebook dataset with (87.3%).

Keywords: Machine Learning, Deep Learning, NLP, Arabic Language, Social Media.