Multi-label Classification of Mobile Application User Reviews using Neural Language Models

Ghaith Khlifi[1], Ilyes Jenhani[2], Montassar Ben Messaoud[3], and Mohamed Wiem Mkaouer[4]

[1] Institut Supérieur de Gestion de Sousse, Université de Sousse, Tunisia
ghaith.khlifi05@gmail.com
[2] College of Computer Engineering and Science, Prince Mohammad Bin Fahd University, Al-Khobar, 31952, Kingdom of Saudi Arabia
ijenhani@pmu.edu.sa
[3] LARODEC, Institut Supérieur de Gestion de Tunis, Université de Tunis, Tunisia
montassar.benmessaoud@tbs.u-tunis.tn
[4] Rochester Institute of Technology, Rochester, NY, USA
mwmvse@rit.edu

Abstract. Mobile application (App) reviews which are provided by users through different App stores are considered as a rich information source for developers to inform about bugs, new feature requests, performance issues, etc. These feedbacks help developers improve the quality of their apps which in turn will significantly impact the user experience and the App's overall ratings. Popular Apps receive a high number of user reviews daily which makes their manual analysis a very tedious and time-consuming task. Automating the classification of user reviews will save developers time and help them better prioritize the issues that need to be handled. Since an App review is text data in which a user may report more than one issue, we propose a multi-label text classification model which uses neural language models. These models have shown high performance in various natural language processing problems. Experimental results confirm that neural language models outperform frequency-based methods in the context of App reviews classification. In fact, with RoBERTa, we could achieve a 0.87 average F1-score and a 0.16 hamming loss performances.

Keywords: Mobile apps · Text classification · Neural language models · Natural language processing.

1 Introduction

Mobile app development involves creating software that can be used on a variety of mobile devices such as phones, tablets, and smartwatches. As the use of these devices continues to grow, mobile applications are becoming increasingly popular. Mobile app stores, such as Google Play and App Store, have also opened up new possibilities for users to discover and download different types of mobile apps. Users can also interact with these app stores by providing ratings and