

University major's recommender system for school students based on recent Intelligent techniques

By

Yazan Mahmoud Mohamed Abdel-Ghany

Supervisor

Porf. Shadi Al-Zu'bi

Co-supervisor

Dr. Tariq Kanan

Al-Zaytoonah University of Jordan, 2023/2024

Abstract

With the development of education and the increase of majors offered in universities and the similarity between some of them and the number of students; it becomes difficult to carry out the process of selecting a student for the appropriate major. Especially to their lack previous experience and knowledge. Which leads to the necessity of finding a solution helping students while choosing their suitable major. With the addressing of the great development in artificial intelligence algorithms. Specifically, machine learning algorithms, which enable us to determine the appropriate specialization through the comparison between the big data of bachelor's students who have previously registered and with the data of the new students. By such development, many researchers have developed many algorithms that work in such field. As Such, we present in this study the recommender system algorithms working on machine learning and targeting students in the two countries: Jordan and Palestine. Those algorithms collect data for first-year

students until graduation and apply them into machine learning algorithms such as CalibratedClassifierCV, Perceptron Mode, RidgeClassifier, SGDClassifier, BernoulliNB and QuadraticDiscriminantAnalysis. Then, filter the best major for students and show effective results. Such results have divided into two parts: the results of algorithms applied in scientific branch and the results of algorithms applied in literary branch. In one hand, the results for SGDClassifier, one of the algorithms used in scientific branch, were: Accuracy: 0.98, F1 Score: 0.98 and Time Taken: 0.1. On the other hand, the results for Perceptron algorithm, one of the algorithms used in literary branch, were: Accuracy: 0.97, F1 Score: 0.97 and Time Taken: 0.01.

Keywords: machine learning, universities, majors, recommendation system, students.