

# Mining student information system records to predict students' academic performance

*Amjad Abu Saa<sup>a</sup>, Mostafa Al-Emran<sup>b</sup>, Khaled Shaalan<sup>a</sup>*

<sup>a</sup>Faculty of Engineering and IT, The British University in Dubai, Dubai UAE

<sup>b</sup>Faculty of Computer Systems and Software Engineering, Universiti Malaysia Pahang, Gambang, Malaysia

## ABSTRACT

Educational Data Mining (EDM) is an emerging field that is concerned with mining and exploring the useful patterns in educational data. The main objective of this study is to predict the students' academic performance based on a new dataset extracted from a student information system. The dataset was extracted from a private university in the United Arab of Emirates (UAE). The dataset includes 34 attributes and 56,000 records related to students' information. The empirical results indicated that the Random Forest (RF) algorithm was the most appropriate data mining technique used to predict the students' academic performance. It is also revealed that the most important attributes that have a direct effect on the students' academic performance are belonged to four main categories, namely students' demographics, student previous performance information, course and instructor information, and student general information. The evidence from this study would assist the higher educational institutions by allowing the instructors and students to identify the weaknesses and factors affecting the students' performance, and act as an early warning system for predicting the students' failures and low academic performance.

## KEYWORDS

Educational data mining; Students' performance; Performance prediction

## REFERENCES

1. Mhamdi, C., Al-Emran, M., Salloum, S.A.: Text mining and analytics: a case study from news channels posts on Facebook, vol. 740 (2018)  
[Google Scholar](#)
2. Al-Emran, M.: Hierarchical reinforcement learning: a survey. *Int. J. Comput. Digit. Syst.* **4**(2), 137–143 (2015)  
[CrossRef](#), [Google Scholar](#)
3. Salloum, S.A., Al-Emran, M., Abdallah, S., Shaalan, K.: Analyzing the Arab gulf newspapers using text mining techniques. In: *International Conference on Advanced Intelligent Systems and Informatics*, pp. 396–405 (2017)  
[Google Scholar](#)

4. Salloum, S.A., Al-Emran, M., Monem, A.A., Shaalan, K.: Using text mining techniques for extracting information from research articles. In: Studies in Computational Intelligence, vol. 740. Springer (2018)  
[Google Scholar](#)
5. Romero, C., Ventura, S.: Educational data mining: a review of the state of the art. IEEE Trans. Syst. Man Cybern. Part C Appl. Rev. **40**, 601–618 (2010)  
[CrossRef](#), [Google Scholar](#)