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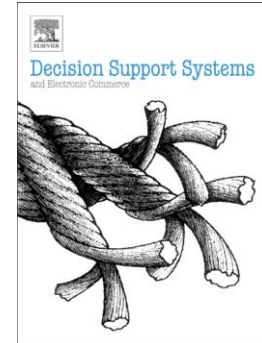
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Early Detection of University Students with Potential Difficulties

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Abstract

Using data mining methods, this paper presents a new means of identifying freshmen's profiles likely to face major difficulties to complete their first academic year. Academic failure is a relevant issue at a time when post-secondary education is ever more critical to economic success. We aim at early detection of potential failure using student data available at registration, i.e. school records and environmental factors, with a view to timely and efficient remediation and/or study reorientation. We adapt three data mining methods, namely random forest, logistic regression and artificial neural network algorithms. We design algorithms to increase the accuracy of the prediction when some classes are of major interest. These algorithms are context independent and can be used in different fields. Real data pertaining to undergraduates at the University of Liège (Belgium), illustrates our methodology.

Keywords: Student attrition, machine learning, prediction, classification, accuracy, remediation.

1. Motivation and objectives

In an era when manufacturing is no longer the dominant activity, post-secondary education has become crucial to economic success. It is estimated

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