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Predicting Student Orientation Satisfaction Using Random Forest : A Moroccan Case Study

Communication Info

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Abstract

In the Moroccan educational system, mismatches between student aspirations and institutional placement frequently lead to deep academic dissatisfaction [1]. This study utilizes Educational Data Mining [2] to predict orientation satisfaction and identify its primary determinants among high school students in the Souss-Massa region. Approaching this as a binary classification problem, we polarized the dataset into distinctly "Satisfied" and "Dissatisfied" profiles. A Random Forest (RF) classifier was employed for its robustness and interpretability [3], while SMOTE was applied to address natural class imbalance [4]. Results demonstrate that the RF model achieves high predictive accuracy. Crucially, feature importance analysis reveals that specific regional grades and socio-demographic factors significantly outweigh general academic averages in predicting dissatisfaction. This data-driven framework empowers educational counselors to proactively identify at-risk students before final orientation decisions are made.

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References

- [1] Lent, R. W., & Brown, S. D. *Integrating person and situation perspectives on work satisfaction: A social-cognitive view*. Journal of Vocational Behavior, 69(2), (2006), 236-247.
- [2] Romero, C., & Ventura, S. *Educational data mining and learning analytics: An updated survey*. Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery, 10(3), (2020), e1355.
- [3] Ahmad, F., Ismail, N. H., & Aziz, A. A. *The prediction of students' academic performance using classification data mining techniques*. Applied Mathematical Sciences, 9(129), (2015), 6415-6426.
- [4] Chawla, N. V., Bowyer, K. W., Hall, L. O., & Kegelmeyer, W. P. *SMOTE: synthetic minority over-sampling technique*. Journal of Artificial Intelligence Research, 16, (2002), 321-357.