Classification of Brand Perception Using Random Forest: Brand Preference, Brand Loyalty, and Brand Trust

Muhammed İkbal Yılmaz[1*+], Özge Yıldız[2] and Şahika Gökmen[3,4]

[1, 2] Undergraduate Student, Department of Econometrics, Faculty of Economics and Administrative Sciences, Hacı Bayram Veli University, 06500, Ankara, Turkey.
[3] Associate Professor, Department of Econometrics, Faculty of Economics and Administrative Sciences, Hacı Bayram Veli University, 06500, Ankara, Turkey.
[4] Researcher, Statistics Department, Uppsala University, Uppsala, Sweden.

[* +] *Corresponding author and Speaker e-mail: myucanlar@gmail.com*
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Abstract

Brands play a crucial role in today's world, helping brand executives develop strategies, gain a competitive advantage, and connect with their target audience. Brand Preference (BP), Brand Loyalty (BL), and Brand Trust (BT) are key concepts embraced by fashion experts and capital producers, and they are further explored through university students in this study. This research addresses a gap in the literature by analyzing students' BP, BL, and BT levels using machine learning and the Random Forest algorithm. Although real-time data from online shopping platforms can assess personal preferences, identifying the most influential factors affecting brand attitudes with machine learning is still uncommon. By applying decision tree classifiers on various dataset subsamples and using a meta-predictor to reduce overfitting, this study aims to improve prediction accuracy. The research is based on data from undergraduate students at Ankara Hacı Bayram Veli University's Econometrics and Economics departments during the 2023/2024 spring semester. The 'Brand Perception Scale' data is analyzed with the Random Forest algorithm, known for its accuracy in classification. The dependent variables BP, BL, and BT are predicted based on twenty-two independent variables. The main results show that brand reputation, recognizability, fashion, and quality are the most influential factors for all three variables, while demographic factors such as birthplace, gender, and department have minimal impact.

Keywords*:* Machine Learning Classification, Brand Trust, Brand Loyalty, Brand Preference, Random Forest, Decision Trees