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Behavioural Analysis and Machine Learning for Social Media Bot Detection: A Comparative Study of Random Forest, SVC, and Decision Trees

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Abstract

This study investigates the application of behavioural analytics and machine learning to the detection of social media bots, employing a quantitative research design implemented in Python. A labelled dataset of user activity was used to train and evaluate multiple models, including Random Forest, Support Vector Classifier, and Decision Tree algorithms. Model performance was assessed through cross-validation using accuracy, precision, recall, and F1-score metrics. The findings demonstrate that traditional machine learning models, when supported by robust feature engineering, can equal or surpass more complex approaches such as deep learning. The study's significance lies in advancing scalable, transparent, and computationally efficient frameworks for

combating malicious automation on social platforms. © The 2026 International Conference on Artificial Life and Robotics (ICAROB2026).

Author keywords

Analysis error; Multibody dynamics (MBD); Numerical integration; Ordinary differential equation

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