

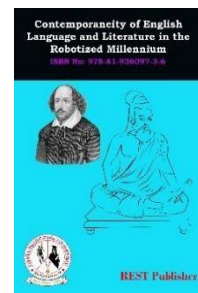


Contemporaneity of Language and Literature in The Robotized Millennium Vol: 8(1), 2026

REST Publisher; ISBN: 978-81-936097-3-6

Website: <https://restpublisher.com/book-series/cllrm/>

DOI: <https://doi.org/10.46632/cllrm/8/1/11>



The Theme of Alienation in Modern English Literature a Machine Learning Approach to Psychological, Social, and Identity Dimensions

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Abstract: Alienation has been one of the most prevailing and developing themes in the modern English literature, having origins back to the initial concept introduced by Karl Marx and further development in twentieth-century literature under the influence of colonialism, migration, and industrialization. The current paper studies alienation as a multifaceted phenomenon consisting of psychological alienation, social alienation, and identity alienation resulting in the Overall Alienation Index, which demonstrates the aggregate effect of estrangement depicted in literature. Based on the sample of 200 observations, descriptive statistics demonstrate high variance across all dimensions, while the highest average value is observed for psychological alienation, pointing at the strong feeling of individual estrangement in modern literature. Two machine learning models such as Support Vector Regression (SVR) and Ada boost Regression were used to develop the model and predict the Overall Alienation Index the SVR model exhibited better prediction power, having attained a high R^2 of 0.94 against the AdaBoost R^2 of 0.81. In addition, it produced low error measures for RMSE and MAE. Additionally, through correlation testing, it was found out that psychological alienation is the dimension that influences the index the most, while all the three dimensions are independent of each other. This clearly highlights not only the literary significance of the theme of alienation but also the importance of computing techniques in measuring it.

Keywords: Alienation, Modern English Literature, Support Vector Regression, AdaBoost Regression, Identity Fragmentation

1. INTRODUCTION

The concept of alienation is evident from the literature in modern English during both the earlier and later periods through the work of many writers. Earlier ecocriticism focused on nature literature and encouraged writings that appreciated the beauty of the nonhuman species and creatures. Likewise, by perceiving the ocean as an autonomous ecosystem, there emerge new ways of interpreting the early modern English literature.[1] This not only provides insights into the complex ecological relationships but also provides an alternative perspective regarding multicultural relations in the interconnected global world.[2] Alienation has been an integral literary theme since time immemorial; however, it reached its peak during the 20th century when people gradually began to alienate themselves from nature and grew closer to the fast-paced machine world.[3] Alienation is part of what leads to revolutionary consciousness because it makes clear that the absence of consciousness or distorted perceptions of reality may lead one not to be able to see or even envision other alternatives for the world around them. [4] It is possible to trace the emergence of the theme of alienation through the historical context specifically in the twentieth century. This was a time when colonialism in Europe led to changes in many parts of the world, as well as the migration of people who were not white into white-dominated societies. [5]. Alienation as a Theme in Contemporary English Literature In the context of the present discussion, what seems to be more important is the identification of an intermediary stance that can link the different approaches toward alienation.[6] Alienation as a Theme in Contemporary English Literature In the context of the present discussion, what seems to be more important is the identification of an intermediary stance that can link the different approaches toward alienation. This kind of moderate approach can be found in the writings of Michel Foucault, which offer an appropriate way of studying alienation against the backdrop of society, knowledge, power, and the individual experience.[7] This part of the paper will focus on the frequency distribution of the word fuck in spoken British English based on

metadata related to sociolinguistic variables encoded in the BNC.[8] The Theme of Alienation in Modern English Literature The introductory use of the word ‘alienation’³ by Karl Marx in the late 19th century has been renewed in the mid-20th century with the development of immigration to America which has hit a new peak with regard to the number of émigrés.[9] The idea of alienation, analysed by philosophers, sociologists, and psychologists throughout the centuries, is employed to define an individual’s indifference towards and/or incapacity of building up any relationship with other individuals or with themselves and/or with the material world, or with the institutions like social, political, and religious institutions..[10] Despite the fact that the idea of alienation is one that has been receiving a lot of attention lately, it is important to remember that there have been other instances of alienation in different civilizations at different periods of time before now. [11] Theme of Alienation in Modern English Literature Love and intimate relationship are becoming complicated, intricate and fragile in the contemporary era. This essay will explore the issue of representation of theme of love in contemporary literature which reflects mental instability of people in society because of anxiety, loneliness and separation.[12] The Theme of Alienation in Modern English Literature Analysis of the majority of the plays published in Nigeria shows the thematic contexts of such works as the ones in which much reflection of the dichotomy between “haves” and “have notes” takes place.[13] The Theme of Alienation in Modern English Literature Alienation has been described by Karl Marx as the multi-faceted phenomenon when workers become estranged from the product, the process of labour, their own human capabilities, and social connections.[14] The Theme of Alienation in Modern English Literature Alienation is a state when an individual is estranged and feels one-self alone, worthless and meaningless. This could be a result of either socio-political environment or capitalism, but it is true that this individual has to suffer from psychological torment.[15] Alienation as a Theme in Modern English Literature Indian English Drama occupies a very significant and dynamic position within the wider sphere of Indian English Literature. While poetry and fiction in English won immediate popularity, drama in English took time to emerge owing to the complex interaction between the native culture of drama, colonialism, socio-political changes, and the emerging sensibility of modern India. [16] Alienation as a Theme in Modern English Literature Herein lies the secret of the writer’s successful universalization of the issue of alienation experienced by a human being. The central character is, indeed, the author himself, battling against the torturous experience of alienation. [17] Alienation as a Theme in Modern English Literature Over the last forty years, there have been three distinct phases in the development of African literature and its theatrical forms. These are indicative of the natural response of the changes in politics and socio-cultural values on ethnic, national, and international levels brought about by both colonialism and neo-colonial disillusionment. [18] The topic of alienation has been treated differently throughout modern literature. The Theme of Alienation in Modern English Literature The alienated hero is one of the common themes in a lot of fiction of the twentieth century American and European literature. [19] The Theme of Alienation in Modern English Literature During the past few decades, Indian English literature has evolved from colonial themes to identity themes. Many writers have contributed to this change. [20]

2. METHODOLOGY

In the current study, the quantitative approach will be used to investigate the problem of alienation using the data sample comprising 200 observations. Specifically, three types of alienation, namely, psychological alienation, social isolation, and identity fragmentation will be considered in order to calculate the Overall Alienation Index. In order to conduct the correlation analysis, pair plot and heat map will be used. Regression models including Support Vector Regression and AdaBoost regression models will be constructed in order to predict the Overall Alienation Index. The performance of the models will be assessed based on the following criteria: R^2 , EVS, RMSE, MAE, Max Error, MSLE, and Med AE.

Support Vector Regression: The Support Vector Machine algorithm is a supervised machine learning approach relying on the concept of structural risk minimization to ensure high generalization capability using a limited amount of training data [21]. When dealing with regression tasks, the training of the SVM model is done through solving a quadratic programming optimization problem. The computational complexity of the problem is proportional to the size of the training set, denoted as (l) , and may consume about (l^2) memory and computing capacity [22]. The “parsimonious” SVM model uses a relatively small number of support vectors. This concise model structure arises due to the learning process, which adjusts the complexity of the model to the data at hand while ensuring its adequate predictive performance on novel data.[23] SVMs for regression have not been appropriate for applications where the target values for the existing samples change frequently, such as in reinforcement learning. [24] However, while applying SVMs in regression problems, it becomes inevitable to incorporate a cost function for the Support Vector Repressor to calculate empirical risk, and thereby, minimize the regression errors.[25] On the other hand, theoretically speaking, the SVM is a statistical learning machine that can learn from small samples because it is based on statistical learning theory.[26] The SVM paradigm has become a widely accepted toolbox in solving the practical problem in terms of non-linear classification and regression problems.[27] However, this aspect has remained less investigated in the field of soil sciences, as there is no

detailed information available about the application of the SVM parameters for optimizing the soil properties. SVM regression models have two important characteristics that can be optimized. [28] The core aim of the research is to construct a precise LS-SVM model and to find appropriate predictive models for predicting net electricity consumption in Turkey [29]. SVM is a non-parametric learning algorithm that, in theory, allows the use of any number of parameters. But in practice, it employs a finite number of parameters, the number of which depends on the size of the data set available. The solution to the basic SVM problem is based on quadratic optimization using dual optimization to maximize the posterior distribution and find out the optimal value of the model parameter. [30]

Ada Boost Regression: The effectiveness of Ada Boost in enhancing the classification margin of training samples has been proven [31]. In some parts of the classification space, especially from the origin (0, 0) till the intersection point, Ada Boost can perform differently than logistic regression. Additionally, the approaches differ in terms of their sensitivity and specificity [32]. Over the past few years, AdaBoost has been receiving increasing interest as one of the machine-learning methods and it has proved to be quite successful in object detection in computer vision [33]. In the current research, Ada Boost regression is used for developing a predictive model of crop yield in agriculture. It is especially helpful due to its approach to ensemble learning. [34] It is especially important for regions where pesticides are widely applied and its influence on the health and yield of the crops might be unpredictable. Ada Boost regression is going to help in solving the problem of inadequate predictive models. [35] Bagging simply averages the output, but the evaluation of the Ada Boost can be utilized and the weighted median could be used. [36] Ada Boost means adaptive boosting. A classifier trained through AdaBoost involves training a classifier from the original data set, followed by training another copy of the same classifier from the modified dataset that takes into account balancing of erroneous data points so that the subsequent classifiers could focus on the instances causing more errors.[37] The machine learning algorithm is comprised of two classifiers for video frame retrieval, Ada boost and regression ABR classifier.[38] Ada Boost algorithm was introduced initially for solving classification problems through the use of decision trees, however, the algorithm has since then been used for solving classification and regression problems utilizing various other models as the weak learner.[39] Ada Boost algorithm has not been used in yield prediction yet.[40]

Input and output Parameters

Psychological Alienation: Score Psychological Alienation Score refers to how much people feel separated, isolated, disappointed, and alienated. Higher scores indicate greater feelings of alienation psychologically from themselves, the environment, or even their own experiences in today's society and culture.

Social Isolation Score: Social Isolation Score refers to how disconnected individuals feel from their family members, friends, communities, and social network. High values imply less contact with other people, less social support, and less feeling of being part of the contemporary society.

Identity Fragmentation Score: Identity Fragmentation Score refers to how uncertain, inconsistent, and conflicting an individual's identity may be. High values mean difficulty in keeping consistent and coherent self-concept in the light of changing social, cultural, and personal conditions.

Overall Alienation Index: The Alienation Index is an index that considers the element of alienation psychologically, socially, and in terms of a fragmented self. High scores indicate the presence of increased alienation and also indicate that alienation has various aspects in contemporary English literature.

3. RESULT AND DISCUSSION

There is shown the diversity of alienation among psychological, social, and identity dimensions. The Overall Alienation Index has large variability because people have different experiences of alienation. Large index values represent greater alienation; in the process of alienation formation, psychological distress, social isolation, and identity play different roles.

TABLE 1. Descriptive Statistics the Theme of Alienation in Modern English Literature

	Psychological Alienation Score	Social Isolation Score	Identity Fragmentation Score	Overall Alienation Index
count	200	200	200	200
mean	56.3006	52.82805	49.0501	52.88185
std	22.11671	21.97503	23.04796	12.6294
min	20.41	15.38	10.81	20.6
25%	37.145	34.61	29.165	43.07
50%	57.085	55.625	49.405	52.875
75%	76.7675	70.6675	70.8325	61.67
max	94.02	89.29	84.98	80.91

Table 1 shows Descriptive Statistics on the Theme of Alienation in Modern English Literature are presented. Mean values of variables, including Psychological Alienation, Social Alienation, and Identity Disintegration are 56.30, 52.83, and 49.05, respectively. It can be seen that the level of alienation is relatively high.

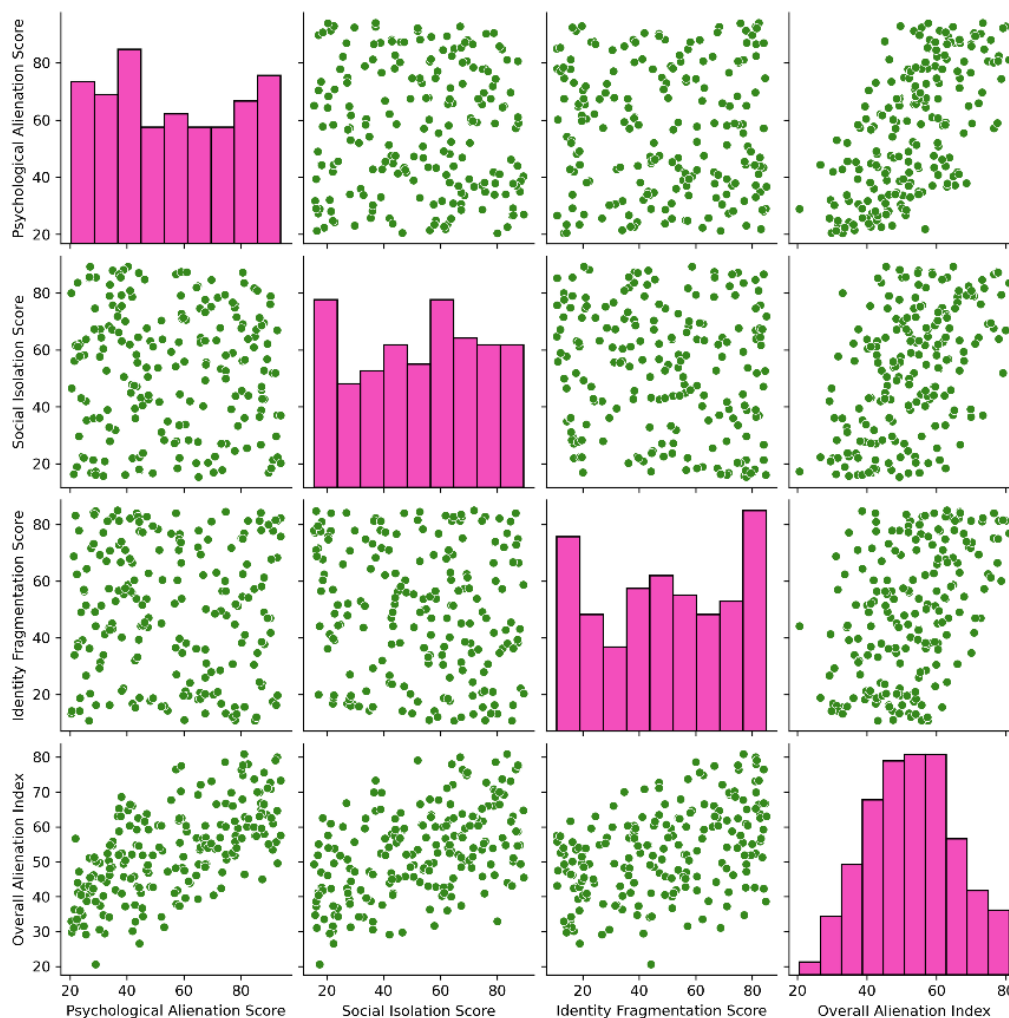
**FIGURE 1.** Scatter Plot of the Theme of Alienation in Modern English Literature

Figure 1 presents the correlation between Psychological Alienation, Social Isolation, Identity Fragmentation, and Overall Alienation Index. The scatterplots reveal quite a lot of variability in all three factors. Overall Alienation Index demonstrates a generally positive correlation with each factor since the increase in individual alienation factors is often related to increase overall alienation. The diagonal histograms represent the distribution of scores for 200 respondents.

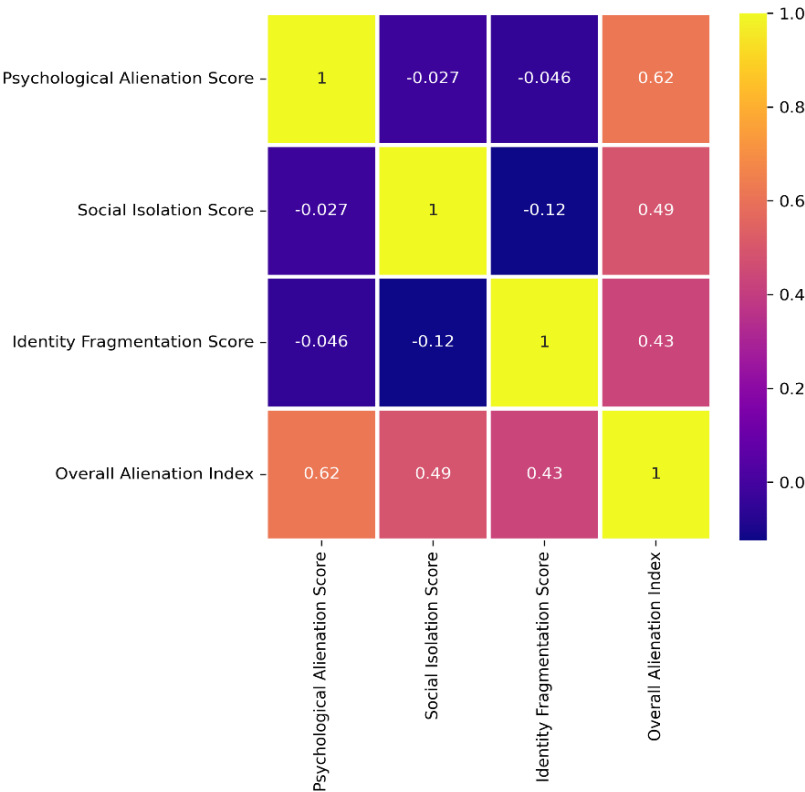


FIGURE 2. Correlation Heat Map between the Themes of Alienation in Modern English Literature

Figure 2 is an illustration of the correlation matrix between the main components of alienation in modern English literature. Psychological Alienation has a moderate correlation with the Overall Alienation Index ($r = 0.62$), whereas Social Isolation ($r = 0.49$) and Identity Fragmentation ($r = 0.43$) have weak correlations. The three individual components of alienation have negative but weak correlations ranging from -0.027 to -0.12 , which implies that the three are quite distinct components of alienation.

Support Vector Regression

Predicted vs Actual Overall Alienation Index (Training data)

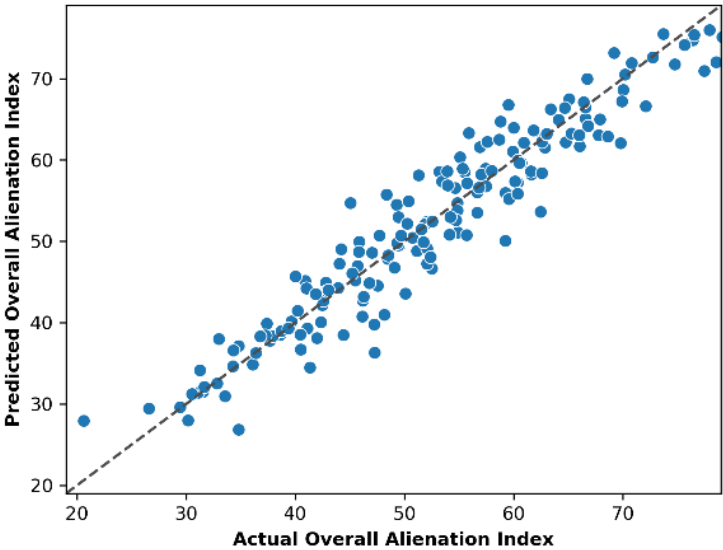


FIGURE 3. Performance Score Support Vector Regression Predicted Actual Overall Alienation Index (Training data)

Figure 3 shows the correlation between real and predicted values of Overall Alienation Index in the training dataset based on SVR as the correlation is quite strong since most data points are drawn around the line of reference. Support Vector Regression's outputs are shown below: $R^2 = 0.91927$, $EVS = 0.91976$; it implies that 91.9% of the variation is explained by the model. Values of RMSE and MAE are very low, while the output of MaxError equals to 10.89824.

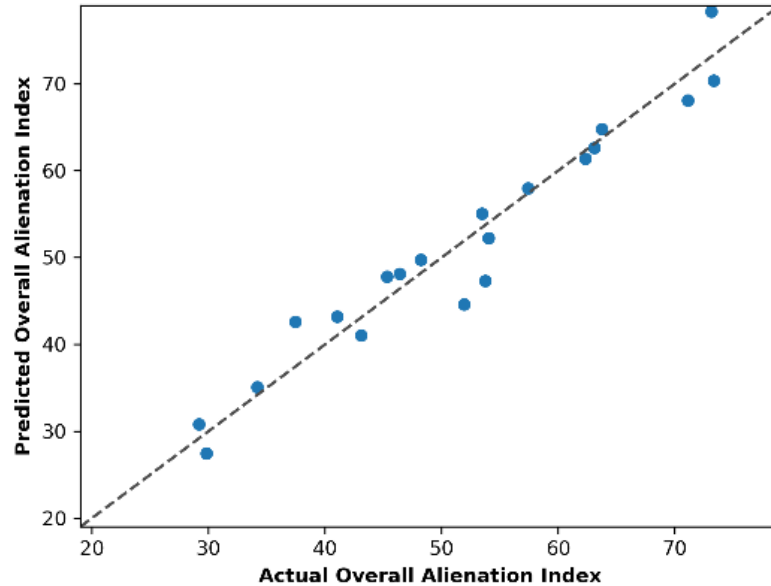
Predicted vs Actual Overall Alienation Index (Testing data)**FIGURE 4.** Performance Score Support Vector Regression Predicted Actual Overall Alienation Index (Testing data)

Figure 4 provides the actual versus predicted Overall Alienation Index for the test data set. Many data points lie near the diagonal reference line, showing high similarity between the actual and the predicted values. From the above results, the R^2 is 0.94156 and EVS is 0.94172, showing that the SVR method has captured quite a lot of variation. From the results, we can see that the RMSE is 3.19921 and the MAE is 2.56937, showing small prediction errors, while MaxError is 7.32814, which is the maximum prediction error.

TABLE 2. Performance Metrics of Support Vector Regression (Training Data and Testing Data)

Data	Train	Test
Model	Support Vector Regression	Support Vector Regression
R2	0.91927	0.94156
EVS	0.91976	0.94172
MSE	12.64826	10.23492
RMSE	3.55644	3.19921
MAE	2.71482	2.56937
Max Error	10.89824	7.32814
MSLE	0.00528	0.00419
Med AE	2.26732	1.90714

Table 2 shows a comparison of the SVR model performance on the training and testing sets. This model achieved an R^2 score of 0.91927 for the training data set and 0.94156 for the testing data set, as well as EVS value of 0.91976 for the training data set and 0.94172 for the testing data set.

Ada Boost Regression

Predicted vs Actual Overall Alienation Index (Training data)

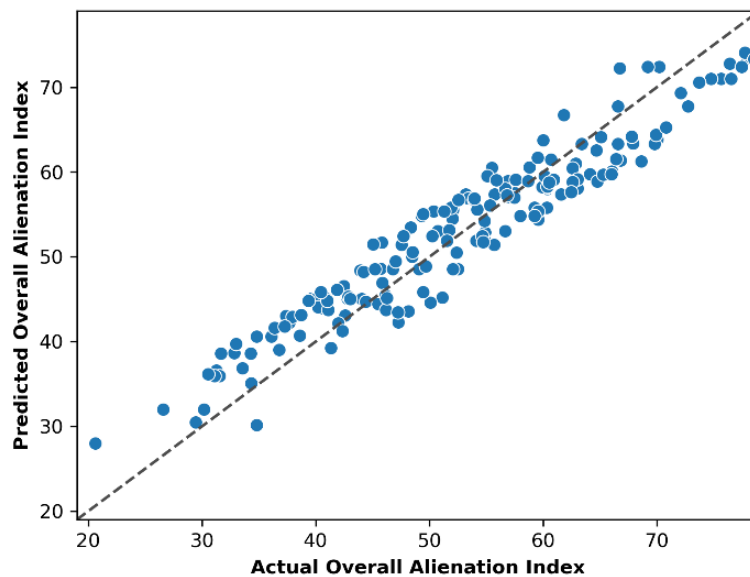


FIGURE5. Performance score Ada Boost Regression Predicted Actual Overall Alienation index (Training Data)

Figure 5 shows the connection between the actual and predicted values of the Overall Alienation Index values calculated by applying Ada Boost Regression to the training set. Observations tend to be arranged around the diagonal line, which is an indication of a high connection between actual and predicted values. An R^2 of 0.90264 and EVS of 0.90283 was observed in the training set through the application of Ada Boost Regression. The RMSE value of 3.90570 and MAE value of 3.45297 show relatively moderate prediction error. In the test set, the R^2 value went down to 0.80570, while RMSE and MAE were up to 5.83342 and 4.81094, respectively.

Predicted vs Actual Overall Alienation Index (Testing data)

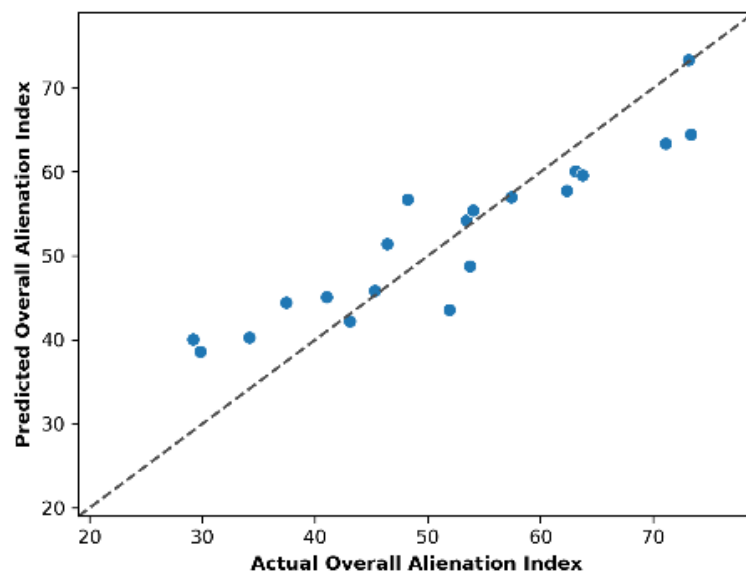


FIGURE 6. Ada Boost Regression Predicted Actual Overall Alienation index performance score (Training Data)

Figure 6 provides the Actual vs. Predicted plot for the Overall Alienation Index in the case of Ada Boost Regression model in the testing dataset. The plotted data points seem to have some correlation with the diagonal line, but there are many points that deviate from the prediction process. In the testing process, the values of R^2 ,

EVS, RMSE, MAE, Max Error, MSLE, and Med AE were 0.80570, 0.80723, 5.83342, 4.81094, 10.87708, 0.01685, and 4.78225 respectively.

TABLE 3. Performance Metrics of Ada Boost Regression (Training Data and Testing Data)

Data	Train	Test
Model	Ada Boost Regression	Ada Boost Regression
R ²	0.90264	0.80570
EVS	0.90283	0.80723
MSE	15.25446	34.02878
RMSE	3.90570	5.83342
MAE	3.45297	4.81094
Max Error	7.38450	10.87708
MSLE	0.00639	0.01685
Med AE	3.64350	4.78225

Table 3 presents the performance of the Ada Boost Regression algorithm on the training and testing data sets. In the training data set, the R² was 0.90264 and EVS was 0.90283, while for the testing data set, R² was 0.80570 and EVS was 0.80723. There is an increase in the value of error measurements with the testing data set, such as MSE, which has increased from 15.25446 to 34.02878, RMSE from 3.90570 to 5.83342, and MAE from 3.45297 to 4.

4. CONCLUSION

In relation to the results found in this research, it should be noted that the problem of alienation in the modern English literature is rather multifaceted and involves various aspects such as psychological, social, and identity aspects, which impact the process of alienation individually. In relation to the results of the descriptive analysis, the differences are very large among the participants, and the aspect of psychological alienation appears to be the most important predictor of the Overall Alienation Index, and there is no significant correlation among three alienation factors, which proves their theoretical uniqueness. Speaking about the prediction models, the SVR model performs better than the AdaBoost regression due to the larger R² and EVS values and smaller error rate. While AdaBoost performed fairly well on the training set, its effectiveness on the test set was significantly reduced, indicating increased susceptibility to over fitting. This finding is indicative of the utility of machine learning methods, such as SVR, in gaining quantitative understanding of literary and psychosocial issues analysed using qualitative methods. This study has provided a unique perspective through which one can view the interdisciplinary field of computational modelling and literary criticism, thus highlighting the importance of the concept of alienation within modern English literature.

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