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Course Code :- SPIC 4A 07

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Project No :- SSE/26/10/314-3

A. $\checkmark$

Title - 3 :

Enhancing Job Rescission Forecasting: XGBoost vs Support Vector Machines Performance Evaluation.

Introduction :-

Paragraph - 1 :

1) Definition :

This study compares the predictive performance of XGBoost and Support Vector Machines (SVM) in Enhancing Job rescission events in the industry. Job rescission refers to withdrawal of employment offers before an employee starts working.

2) Importance in Today's World :-

→ Economic Planning :

Reliable predictions assist organizations and policymakers in implementing strategies to mitigate unemployment risks.

→ Resource Allocation :

Enhance decision-making regarding resource distribution and talent management within companies.

Applications of Research:-

*Career Counselling:-
Provides insights for career advisors to guide individuals in making informed employment decisions.

*Human Resources:-
Aids HR departments in identifying potential job rescission scenarios, allowing for proactive interventions.

Paragraph-2:-

1) Total Number of articles Published in Past 5years.

-> A systematic literature review covering from 2012 to April 2023 identified 52 relevant peer-reviewed studies on machine learning techniques for predicting employee turnover. This indicates a growing interest and substantial research output in this area over the past decade. Continuously assessing the effectiveness of retention strategies through predictive analytics.

Paragraph-3:-

1) Existing Experience in Research!

Previous studies have demonstrated the efficiency of machine learning models like SVM and XGBoost in various predictive tasks. For instance, research comparing these algorithms in forecasting daily global solar radiation found both models to be effective, with XGBoost showing greater stability and efficiency.

2) Aim of Study!

To evaluate and compare the performance of XGBoost and SVM algorithms in accurately forecasting job rescission events, thereby identifying the more suitable model for this application.

Materials and Methods :-

Paragraph-1:-

Study setting - SIMATS [SIMATS Engineering]

No. of Groups : 2

Group 1: XGB

Group 2: SVM

* This step took advantage of the data exploration and Quality verification made earlier to create the final data.

2) Most Cited Articles and Findings:-

→ One Notable study is "performance Evaluation of Support vector Machine classification approaches in data mining", which has been widely cited for its comprehensive analysis of support vector machine applications across various domains.

3) Best Study in our Opinion:-

Research on Economic Recession Prediction model from the Multiple Behavioral features Perspective

- Chang Wang
- Zhi Xiao
- Fang-Su Zhao
- Du Ni
- Lue Li

- Published on June 21, 2019.

Paragraph -2:-

Same Groups :-

Pseudo Code :-

XGBoost :

→ Import Libraries
→ Load data
→ Preprocess data
→ Split data
→ Train model
→ Compare Model
→ Result

Paragraph -3:-

Pseudo Code for Support Vector Machine (SVM):-

→ Import libraries
→ Process the data
→ Split the dataset into features
→ Compute Models
→ Update Weights
→ Compare Nodes
→ Result

Paragraph - 4 :

Testing Setup :-
→ Data Preparation
→ Feature Engineering
→ Data Splitting
→ Model Training
→ Class Validation
→ Comparision

Data Collection :- * Kaggle * IEEE Explorer

Results & Discussion :-

→ Performance : XGBoost and SVM have shown comparable accuracy in predictive tasks.

→ Stability : XGBoost models tend to be more stable and efficient, handling large datasets effectively.

Limitations !

→ Data Specificity

→ Model Interpretability

Future Scope :
→ Domain-Specific Research
→ Hybrid models

→ Real-Time Applications

Conclusion :— Evaluating the precision of XGBoost and support vector machines in forecasting job rescission is essential for improving workforce stability and planning.

Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean
ACCURACY	XGB	10	96.2930	2.31289	.73140
	SVM	10	94.7200	.76056	.24051

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
									Lower	Upper	
ACCURACY	Equal variances assumed	15.970	.001	2.043	18	.056	1.57300	.76993	-.04456	3.19056	
	Equal variances not assumed			2.043	10.924	.066	1.57300	.76993	-.12304	3.26904	

Simple Bar Mean of ACCURACY by GROUP

Error Bars 95% CI
Error Bars +/- 2 SD