Shri Tontada Siddhalingeshwar Kalyana Kendra's
Tontadarya College of Engineering Gadag
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[Approved by AICTE New Delhi and Affiliated to Visvesvaraya Technological University, Belgaum]
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
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TECHNICAL SEMINAR (21CS81)

SYNOPSIS

College	**Tontadarya College of Engineering, Gadag**	
Course Name:	**Technical Seminar**	
Course Code:	**21CS81**	
Department	**Department of Computer Science and Engineering**	
Course:	**B.E (8th Semester)**	
Sl. No	**USN**	**Student Name**
1	**2TG21CS016**	**Azam Mustufa Didagur**
Project Title	**AI in Economic Forecasting and Policy Design**	
Project Type (In-House/Internship)	**In-House**	
Under taken at	**Tontadarya College of Engineering, Gadag**	
Internal Guide	**Name: Adhokshaja Kulkarni** **Designation: Asst. Professor**	

INTRODUCTION:

In recent years, Machine Learning (ML) systems have advanced significantly in both accuracy and contextual understanding. No longer limited to simple classification or regression tasks, modern ML models can now process vast amounts of data — both structured and unstructured — while capturing complex relationships within it. This evolution has opened up transformative opportunities in traditionally non-technical fields such as economics and public policy.

The integration of ML into economic decision-making and policy design holds immense potential. Governments and institutions can harness data-driven insights to forecast unemployment trends, anticipate inflation, optimize welfare distribution, and enhance governance efficiency. While structured datasets like census figures or macroeconomic indicators remain important, recent advancements in natural language processing (NLP) and deep learning now allow us to extract meaningful patterns from unstructured sources such as social media, policy documents, and news reports.

OBJECTIVES:

- Highlight the predictive power of ML models in capturing trends such as unemployment and inflation, especially in the context of post-pandemic economic recovery.
- Showcase how ML systems can automate the processing of large datasets, which go far beyond the limits of conventional spreadsheet tools. With growing data sizes, efficient storage and processing often require databases and computational expertise — something ML frameworks are well-equipped to handle.
- Reduce the burden of manual data analysis, where traditionally economists or policymakers would spend significant time drawing conclusions from raw data. ML tools can now perform these tasks with speed and consistency, often surfacing non-obvious patterns that might be missed through human analysis.
- Illustrate the role of ML in using both structured and unstructured data — including social media, news articles, and policy documents — to support real-time, responsive policy decisions.

METHODOLOGY:

1. **Data Collection:** The first phase involves gathering data from reliable sources such as government surveys, national statistical agencies (e.g., NSSO, PLFS), and NGO-led initiatives. These sources offer comprehensive economic and demographic data, often collected through structured surveys and public reports. Additionally, secondary data such as macroeconomic indicators, labour market statistics, and inflation indices will be sourced from international bodies like the World Bank, IMF, or CMIE (for India-specific datasets).

2. **Dataset Generation:** The raw data will be cleaned, pre-processed, and structured into usable datasets. This involves handling missing values, normalizing numeric features, encoding categorical variables, and combining data from multiple sources into a unified format suitable for machine learning tasks.

3. **Model Development:** Supervised learning models (e.g., Linear Regression, Random Forest, XGBoost, or LSTM) will be trained on historical economic data to predict variables such as unemployment rates or inflation levels. Feature selection and engineering techniques will be used to enhance the model's accuracy.

4. **Model Tuning and Evaluation:** To ensure optimal performance, the models will be tuned and evaluated using appropriate performance metrics. Classification tasks will utilize metrics such as ROC-AUC, Precision-Recall, and F1-score, while regression models will be evaluated using Mean Squared Error (MSE), Root Mean Squared Error (RMSE), and R^2 scores. Cross-validation techniques will be applied to improve generalization**.**

5. **Integration of Unsupervised Learning:** Unsupervised learning methods (such as clustering or topic modelling via NLP) will be employed to analyse and adapt to unstructured data sources — including news articles, political announcements, social media, and international economic events. This allows the system to dynamically respond to real-world shocks such as pandemics, disasters, or trade disruptions, enriching its policy recommendations.

6. **Model Deployment:** Finally, the developed system will be prepared for deployment as a decision support tool. This may involve building a simple dashboard or interface where policymakers can input current indicators and receive predictive insights or alerts based on the trained ML models

CONCLUSION:

This project explores the significant advancements in Machine Learning (ML) and their transformative application to economic forecasting and policy design. By leveraging ML's ability to process vast amounts of both structured and unstructured data, this work aims to harness data-driven insights for more accurate predictions of key economic indicators like unemployment and inflation, and to optimize policy decisions. The methodology involves collecting comprehensive data, developing and rigorously evaluating sophisticated ML models, and integrating insights from various data sources, including real-time information. Ultimately, this research highlights the potential of ML to automate complex analyses, uncover patterns missed by traditional methods, and provide robust decision support tools, thereby enhancing the effectiveness and responsiveness of economic policy-making.

Guide Signature

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