Insights from Exit Polls and Election Outcomes:

A Comparative Analysis

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# Introduction (Heading *1*)

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# LITERATURE REVIEW

The study by Philip Chan, Salvatore Stolfo, and David Wolpert [1] Methods for voting classification algorithms, such as Bagging and AdaBoost, have been highly successful in enhancing the accuracy of classifiers for both artificial and real-world datasets. These algorithms employ techniques like perturbation, reweighting, and combination to influence classification error. Our empirical study highlights that Bagging reduces variance in unstable methods, while boosting methods like AdaBoost and Arc-x4 reduce both bias and variance in unstable methods. Interestingly, we found that Bagging performs better with probabilistic estimates and no-pruning, as well as when data backfitting is applied. AdaBoost's ability to reduce error correlates with increases in average tree size, showcasing its efficacy. Our findings indicate that voting methods significantly reduce mean-squared errors compared to non-voting methods. Additionally, our scatterplots visually demonstrate how AdaBoost reweights instances, effectively targeting challenging areas, outliers, and noise, making it a robust tool for classification tasks. Despite their successes, voting classification algorithms like Bagging and AdaBoost also present challenges and limitations. While Bagging reduces variance, it does not address bias, limiting its effectiveness with inherently biased classifiers. Boosting methods, although effective in reducing both bias and variance in unstable methods, tend to increase variance for stable methods like Naive-Bayes. This indicates a potential drawback when applying AdaBoost to already stable classifiers. Furthermore, Arc-x4 behaves differently from AdaBoost when reweighting instead of resampling, suggesting inconsistencies between these methods. Practical issues, such as numerical instabilities and underflows, arise during the implementation of boosting algorithms, complicating their application. Additionally, while AdaBoost reweights instances to focus on difficult areas and outliers, it may inadvertently amplify noise, potentially leading to overfitting. These limitations highlight the importance of carefully considering the choice and implementation of voting methods based on the specific characteristics of the dataset and classifiers used.

The study by Wei Wang, David Rothschildb, Sharad Goel, Andrew Gelman [2] Election forecasts have traditionally relied on representative polls, which involve randomly sampling individuals to determine their voting intentions. Despite their historical effectiveness, these polls are costly and time-consuming. Furthermore, declining response rates over the decades have reduced the statistical advantages of representative sampling. This paper demonstrates that accurate election forecasts can be generated using non-representative polls with proper statistical adjustments. We illustrate this approach with a novel dataset: daily voter intention polls for the 2012 presidential election conducted on the Xbox gaming platform. By applying multilevel regression and poststratification adjustments to the Xbox responses, we achieved estimates that align closely with leading poll analysts' forecasts, which aggregated hundreds of traditional polls. This finding suggests that non-representative polling can offer faster and less expensive election forecasts, and holds promise for measuring public opinion on various social, economic, and cultural issues. While non-representative polling with statistical adjustments shows promise, it is not without its challenges. The success of this method heavily depends on the accuracy and robustness of the statistical adjustments applied, such as multilevel regression and poststratification. Any errors or biases in these adjustments can lead to inaccurate forecasts. Additionally, non-representative samples, like those from the Xbox gaming platform, may have inherent biases due to the demographics of the user base, which could skew results if not adequately corrected. The paper primarily focuses on a single election cycle, raising questions about the generalizability of the findings to other elections and contexts. Furthermore, the reliance on technology platforms for data collection might exclude populations with limited access to these platforms, potentially leading to underrepresentation of certain groups. Lastly, while cost-effective, non-representative polling may face skepticism from stakeholders accustomed to traditional methods, making widespread adoption a potential hurdle.

The study by Jacob M. Montgomery, Florian M. Hollenbach and Michael D. Ward [3] Ensemble Bayesian Model Averaging (EBMA) offers a significant advancement for scholars in the social sciences by enhancing the accuracy of future event forecasts. By pooling information from multiple forecast models, EBMA generates ensemble predictions akin to a weighted average of the component forecasts. This method assigns weights to each forecast based on their performance during a validation period, ensuring that the most reliable models have a greater influence on the final prediction. The goal is not to identify a single "best" model but to integrate the diverse insights from various forecasting efforts through statistical postprocessing. The effectiveness of EBMA is demonstrated through three applied examples: predicting insurgencies around the Pacific Rim, forecasting U.S. presidential election vote shares, and predicting U.S. Supreme Court Justices' votes. In each case, EBMA significantly improves the accuracy of out-of-sample forecasts compared to individual component models, showcasing its utility and robustness in diverse social science applications. While Ensemble Bayesian Model Averaging (EBMA) shows promise in improving forecast accuracy, it also faces certain challenges and limitations. The method's reliance on historical performance data for weighting models means that it might not adapt well to unforeseen changes or novel situations that deviate significantly from past trends. Moreover, the process of statistical postprocessing and weight calibration can be complex and computationally intensive, potentially limiting its accessibility and usability for researchers without advanced technical expertise. Additionally, the success of EBMA depends on the quality and diversity of the component models; if the models being averaged are biased or flawed, the ensemble forecast could inherit these weaknesses. The method also assumes that past performance is a reliable indicator of future accuracy, which may not always hold true, particularly in rapidly changing or highly volatile environments. Lastly, while EBMA integrates multiple forecasts, it may still be challenged by the intrinsic uncertainties and unpredictability’s inherent in social science phenomena, limiting its overall predictive power.

The study by Vinay K. Jain & Shishir Kumar [4] Exploiting social media data to extract key information presents a significant opportunity in data mining and knowledge discovery. This paper introduces an innovative data collection technique aimed at predicting election outcomes and extracting relevant topics. The technique employs RSS (Rich Site Summary) feeds of news articles and trending keywords from Twitter simultaneously, constructing an intelligent prediction model based on tweet volume and user sentiment. This dynamic keyword methodology significantly enhances the accuracy of electoral predictions by leveraging the vast amount of real-time data available on social media platforms. The model not only captures the sentiments and opinions of voters towards political parties, leaders, and important topics but also adapts to the dynamic nature of social media trends. This approach offers a cost-effective and timely alternative to traditional polling methods, providing valuable insights into voter behavior and election outcomes. Despite its innovative approach, the technique presented in this paper faces several challenges and limitations. Social media data can be noisy and unstructured, making it difficult to ensure the accuracy and reliability of the extracted information. The volume of tweets and user sentiment might not fully represent the broader population, as social media users may not be a representative sample of all voters. Additionally, sentiment analysis algorithms can struggle with nuances in language, such as sarcasm or irony, leading to potential misinterpretations. The reliance on trending keywords and RSS feeds also means the model might miss out on less popular but still significant topics and opinions. Moreover, the dynamic nature of social media can lead to rapid shifts in sentiment and trends, posing a challenge for maintaining the model's accuracy over time. Finally, privacy and ethical concerns arise when collecting and analyzing social media data, requiring careful consideration and adherence to data protection regulations.  
  
 The study by Shuhaida Ismail a,⇑ , Ani Shabri a , Ruhaidah Samsudin [5] Support Vector Machine (SVM) has emerged as a highly effective tool in the field of Artificial Intelligence (AI), particularly for addressing a wide variety of problems, including time-series forecasting. This paper introduces an advanced algorithm known as the Least Square Support Vector Machine (LSSVM), which is further enhanced by combining it with Self-Organizing Maps (SOM) to create the SOM-LSSVM model for time-series forecasting. The primary objective of this paper is to evaluate the flexibility and performance of the SOM-LSSVM model by comparing it to a standalone LSSVM model. To achieve this, the study employs two renowned datasets: the Wolf yearly sunspot data and the monthly unemployed young women data. Experimental results demonstrate that SOM-LSSVM significantly outperforms the single LSSVM model, as evidenced by lower mean absolute error (MAE) and root mean square error (RMSE) values. These findings suggest that SOM-LSSVM offers a promising alternative technique for time-series forecasting, providing enhanced accuracy and robustness in predictive modeling. While the SOM-LSSVM model shows promise, there are several challenges and limitations associated with its implementation. The combination of Self-Organizing Maps (SOM) and Least Square Support Vector Machines (LSSVM) introduces additional complexity, which can increase computational requirements and the time needed for model training and optimization. Additionally, the effectiveness of the SOM-LSSVM model heavily depends on the selection of appropriate parameters for both SOM and LSSVM, which may require extensive experimentation and fine-tuning. The study's reliance on only two datasets (Wolf yearly sunspot data and monthly unemployed young women data) raises concerns about the generalizability of the results across different types of time-series data. Moreover, while the paper reports improvements in MAE and RMSE, it does not provide a comprehensive analysis of other potential performance metrics or the model's robustness under varying conditions. Lastly, the implementation of SOM-LSSVM might be more challenging for practitioners who lack advanced knowledge in machine learning and neural network techniques, potentially limiting its widespread adoption.

The study by Bartosz Krawczyka,∗ , Leandro L. Minkub , João Gamac , Jerzy Stefanowski d, Michał Wozniak [6] In the realm of information systems, learning algorithms frequently operate within dynamic environments where data are collected as transient data streams. This poses unique computational challenges, as algorithms must incrementally process incoming examples using limited memory and time. Additionally, the non-stationary nature of streaming data necessitates that prediction models adapt to concept drifts. This paper surveys the critical role of ensemble methods in data stream classification and regression tasks, particularly in non-stationary environments. It presents a comprehensive overview of various ensemble approaches tailored for data streams, highlighting their effectiveness in handling continuous and evolving data. The paper also delves into advanced learning concepts, including imbalanced data streams, novelty detection, active and semi-supervised learning, complex data representations, and structured outputs. By addressing these advanced topics, the paper provides valuable insights into the state-of-the-art in data stream processing. The conclusion emphasizes open research problems and potential future directions, encouraging further exploration and innovation in this rapidly evolving field. While the paper provides an extensive survey of ensemble methods for data stream processing, several challenges and limitations are noteworthy. The complexity of ensemble methods can lead to significant computational overhead, particularly in resource-constrained environments, potentially limiting their practical applicability. Additionally, the survey's broad scope, while informative, may lack the depth required to fully understand and implement specific ensemble techniques. The paper's emphasis on advanced learning concepts such as novelty detection and semi-supervised learning, though valuable, might overwhelm readers who are not well-versed in these areas. Furthermore, the discussion on adapting to concept drifts, while crucial, could benefit from more concrete examples and practical guidelines for implementation. The reliance on academic datasets and benchmarks in evaluating ensemble methods might not fully capture the challenges faced in real-world applications, where data characteristics can be more complex and unpredictable. Lastly, while the paper identifies open research problems, it could provide more actionable insights and detailed directions for future research to better guide practitioners and researchers in advancing the field.

The study by EDWARD R. TUFTE [7] The outcomes of midterm congressional elections often present a mix of the routine and the inexplicable. Historically, since the Civil War, the incumbent President's party has lost seats in the House of Representatives in every off-year election except one. This consistent trend is intriguing, yet the factors driving variations in these outcomes remain poorly understood. V. O. Key, in "Politics, Parties and Pressure Groups," noted that the midterm election verdict eludes rational explanation. Given that the electorate cannot change the administration during midterms, their approval or disapproval is expressed by altering legislative majorities. This seemingly rational hypothesis fails to fully explain midterm election outcomes, suggesting a complex interplay of factors beyond simple electoral logic. The Founding Fathers' provision for midterm elections introduces a constitutional mechanism whose outcomes defy straightforward rational interpretation, reflecting deeper and perhaps less predictable dynamics within the electorate. Despite the historical trend and the intriguing nature of midterm elections, several challenges arise in understanding and explaining their outcomes. The consistent loss of seats by the incumbent President's party lacks a comprehensive theoretical framework, leaving political scientists with more questions than answers. V. O. Key's observation about the absence of a rational explanation underscores this gap in understanding. The electorate's behavior at midterms, described as lacking logical coherence, complicates efforts to predict or analyze these elections. The Founding Fathers' design for midterms, while constitutionally significant, results in consequences that are difficult to reconcile with any theory that views the electorate as a rational actor. This complexity adds to the unpredictability and enigmatic nature of midterm outcomes, challenging political analysts and historians alike. Furthermore, the paper could benefit from more empirical data and analysis to support its observations, offering concrete examples or case studies to illuminate the factors at play.

The study by Soo Young Kima,∗, Arun Upneja [8] This study focuses on developing an accurate and stable business failure prediction model, which is crucial for market players and risk management. Using experimental data from US restaurants spanning 1980 to 2017, the study employs a majority voting ensemble method with a decision tree (DT) as the base learner. According to principles of diversity and individual optimization, DT and logistic regression (logit) were selected as the fundamental algorithms for the ensemble model. The research produces three distinct models: an entire period (EP) model, an economic downturn (ED) model, and an economic expansion (EE) model, implemented using WEKA 3.9. The prediction accuracies reported are promising: 88.02% for the EP model, 80.81% for the ED model, and 87.02% for the EE model. The study identifies significant variables for each model, showcasing different predictors for economic downturns and expansions. For instance, variables like market capitalization, operating cash flow after interest and dividends (OCFAID), cash conversion cycle (CCC), and return on capital employed (ROCE) emerge as significant in the EE model, while the ED model highlights OCFAID, KZ index, stock price, and CCC. The EP model integrates most variables from both sub-models, except for Tobin’s Q, stock price, and debt to equity (D/E) ratio. The paper contributes significantly by comprehensively evaluating financial and market-driven variables for predicting restaurant failures, especially during economic recessions. It introduces accounting-based measures, market-based variables, and macroeconomic factors to enhance the relevance and effectiveness of prediction models. Moreover, by employing an ensemble model with a decision tree, the study improves interpretability and prediction accuracy, enhancing the utility of its findings for stakeholders in the restaurant industry and beyond. While the study presents promising results, several considerations and limitations should be acknowledged. The reliance on experimental data from US restaurants limits the generalizability of findings to other sectors or geographical regions. The choice of WEKA 3.9 as the modeling tool may restrict the accessibility of the methodology to researchers unfamiliar with this specific software. Despite high prediction accuracies, the actual performance of the models in real-world scenarios outside the study period or economic conditions remains uncertain. The interpretability gained from using decision trees in the ensemble model may still pose challenges, particularly when attempting to discern complex interactions among variables. Additionally, the paper could benefit from a more extensive discussion on the robustness of results to different modeling assumptions or variable selections. Finally, while the study highlights significant variables for each model, further exploration of how these variables interact and contribute to predicting business failure would enrich the depth of the findings.

The study by Chidanand Apt6, Sholom Weiss [9] This paper explores the utilization of decision tree and rule induction methods in data mining, emphasizing their significance in pattern recognition, statistics, and machine learning. These methods are particularly appealing for data mining due to their ability to provide symbolic and interpretable representations of data. Symbolic solutions offer valuable insights into decision boundaries and the underlying logic in datasets, making them highly attractive for commercial and industrial applications of data mining. The paper provides a comprehensive overview of major tree and rule mining methodologies, including recent advances in these techniques. By presenting state-of-the-art methodologies, the paper not only highlights their theoretical foundations but also discusses practical applications and potential advancements in the field. This synthesis contributes to advancing the understanding and implementation of symbolic data mining techniques in various industries. While the paper provides valuable insights, several limitations and challenges should be considered. Decision tree and rule induction methods, while interpretable, may struggle with capturing complex relationships and interactions in highly dimensional or noisy datasets. The paper's focus on symbolic representations might overlook the predictive power of more complex, non-symbolic methods such as neural networks or ensemble learning, which are increasingly prevalent in data mining applications. Additionally, the overview of methodologies, while informative, may lack detailed empirical validation or comparative analysis across diverse datasets and real-world scenarios. Practical considerations such as scalability, computational efficiency, and robustness to outliers or missing data are critical but may not receive comprehensive coverage. Furthermore, the paper could benefit from discussing the limitations of interpretability in decision tree models when faced with intricate decision boundaries or overlapping classes. Lastly, while recent advances are mentioned, more emphasis on emerging trends or challenges in deploying these methods in contemporary data mining environments would enhance the paper's relevance and applicability to current research and industry practices.

The study by Rebecca B. Morton a,b , Daniel Muller c,n , Lionel Page d,e , Benno Torgler [10] This study leverages a voting reform in France to investigate the causal impact of exit poll information on voter behavior, focusing on turnout and bandwagon voting. By exploiting the timing of elections in French overseas territories relative to the release of exit poll results from mainland France, the study provides a robust empirical design to estimate these effects. The findings reveal that knowledge of exit poll information reduces voter turnout by approximately 11 percentage points, marking a significant contribution to understanding voter behavior influenced by real-world circumstances rather than laboratory settings. Moreover, the study identifies a substantial increase in bandwagon voting: voters who do turn out are more likely to vote for the anticipated winner. This empirical evidence underscores the practical implications of exit polls on electoral outcomes, shedding light on both voter engagement and decision-making processes. While the study offers compelling insights, several limitations warrant consideration. The focus on a specific voting reform in France limits the generalizability of findings to other electoral contexts or jurisdictions with different political landscapes and voting behaviors. The study's reliance on exit poll data from mainland France may not fully capture the diversity of voter responses across various regions or demographic groups within French overseas territories. Methodological challenges, such as controlling for potential confounding variables or alternative explanations for changes in voter turnout, could affect the robustness of causal claims. Additionally, the study's findings on bandwagon voting, while significant, might benefit from a deeper exploration of underlying motivations or decision-making processes among voters influenced by exit poll information. Further research could explore variations in the impact of exit polls across different types of elections (e.g., national vs. local) and electoral systems (e.g., proportional representation vs. first-past-the-post), providing a more comprehensive understanding of how information dissemination affects democratic participation and electoral outcomes.

He study by Chakrit Pong-Inwong & Konpusit Kaewmak [11] This paper addresses the use of sentiment analysis in teaching evaluation systems, focusing on detecting student sentiment polarity from feedback messages. Sentiment analysis plays a crucial role in assessing educational quality by analyzing open-ended feedback stored in teaching evaluation systems. Text mining techniques are applied to classify sentiment polarity effectively, enhancing the understanding of student feedback. The study employs various classification methods, including Naive Bayes, ID3, and J48 Decision tree, to compare their effectiveness in sentiment analysis. A novel contribution of the paper is the proposal and evaluation of a voting ensemble method integrated with Chi-Square feature selection for teaching sentiment analysis. Experimental results demonstrate that this approach outperforms traditional classifiers in terms of accuracy, highlighting the benefits of integrating ensemble learning with feature selection techniques. By reducing feature dimensionality during data preprocessing, the study enhances the efficiency and interpretability of sentiment analysis in educational settings. This research not only advances the methodology of sentiment analysis but also provides practical insights into improving teaching evaluation systems through advanced machine learning techniques. Despite its contributions, the paper may have certain limitations. The generalizability of findings could be constrained by the specific context and dataset used in the study. The effectiveness of sentiment analysis in teaching evaluations may vary across different educational institutions or cultural settings, which could affect the applicability of the proposed methods. While the voting ensemble method with Chi-Square feature selection shows promising results, additional validation across diverse datasets or educational contexts would strengthen the robustness of findings. The paper could benefit from a more detailed discussion on the interpretability of results and the practical implications for educational stakeholders, such as teachers and administrators. Furthermore, the study's focus on sentiment polarity detection may overlook other aspects of feedback analysis crucial for improving educational practices, such as thematic insights or actionable recommendations from student comments. Future research could explore these aspects further to provide a comprehensive framework for leveraging sentiment analysis in teaching evaluation systems.

The study by Houshmand Shirani-Mehr & David Rothschild [12] This empirical study critically examines the accuracy and reliability of election polls, focusing on 4,221 polls conducted for 608 state-level presidential, senatorial, and gubernatorial elections between 1998 and 2014. The research highlights that reported margins of error often fail to encompass the full spectrum of survey errors, including both sampling and non-sampling errors collectively known as total survey error. By comparing poll results to actual election outcomes, the study reveals that the average survey error, as measured by root mean square error (RMSE), is approximately 3.5 percentage points. This finding underscores the importance of considering broader sources of error beyond sampling variability alone. The paper further decomposes survey error into election-level bias and variance terms. It identifies an average election-level bias of about 2 percentage points, indicating a common component of error shared across polls for a given election. This shared error is attributed to challenges in reaching diverse population subgroups and reliance on similar screening criteria for estimating voter turnout. Additionally, the study notes that election-level variance exceeds expectations from simple random sampling due to the use of complex sampling designs and adjustment procedures by polling organizations. The findings provide valuable insights into the limitations of polling methodologies and offer explanations for past polling failures, such as those observed in the 2016 U.S. presidential election. By addressing these issues, the study contributes to improving polling practices and offers recommendations for enhancing the accuracy and reliability of election polls in the future. Despite its contributions, the study may have certain limitations. The reliance on polls conducted during the final three weeks of campaigns may not capture the full spectrum of polling practices throughout election cycles, potentially limiting the generalizability of findings to other time periods or types of elections. The focus on state-level elections in the United States may overlook variations in polling accuracy across different countries or electoral systems. Methodological challenges, such as the retrospective analysis of polls and the complexity of decomposing survey error, could introduce biases or uncertainties in the results. Additionally, while the study discusses recommendations for improving polling practice, practical implementation and adoption of these recommendations by polling organizations may vary, affecting the extent to which future polling errors can be mitigated. Future research could explore additional factors contributing to survey error, such as methodological innovations in polling techniques or changes in voter behavior over time. Moreover, comparative analyses across different types of elections (e.g., national vs. local) or polling methods (e.g., online vs. telephone) could provide further insights into the robustness and applicability of findings across diverse electoral contexts.

The study by Sudipta Kaviraj [13] This historical reflection highlights Mahatma Gandhi's foresight in suggesting the dissolution of the Indian National Congress after achieving independence. Gandhi's suggestion was grounded in the logical premise that the Congress had fulfilled its primary goal of leading India to independence from British rule. The transformation of the Congress from a liberation movement into a governing party demonstrated its resilience and adaptability in establishing effective governance post-independence. The recent general elections in India mark a significant milestone in moving towards a political landscape where multiple parties can function without the overwhelming dominance of the Congress. This shift reflects a maturing democracy where diverse political voices and structures are emerging, paving the way for broader representation and governance beyond a single dominant party. However, the practical challenges of disbanding the Congress after independence were substantial. The party, deeply entrenched in India's political fabric and history, faced the daunting task of transitioning from a liberation movement to a governing entity. The partition of the country and ensuing violence underscored the fragile socio-political landscape that demanded stability and continuity, which the Congress symbolized. The absence of viable political alternatives at the time further cemented the Congress's role in establishing and maintaining effective governance. Despite criticisms and controversies, the Congress's historical legacy as an indispensable force in India's political evolution cannot be ignored, highlighting the complexities of transforming from a movement into a governing institution.

The study by Rammohan Mallipeddi and Ponnuthurai N. Suganthan [14] This paper introduces an innovative approach, the Ensemble of Constraint Handling Techniques (ECHT), designed to enhance the effectiveness of evolutionary algorithms (EAs) in solving constrained real-parameter optimization problems. The ECHT leverages the diversity and strengths of multiple constraint handling methods by assigning each method its own population within the EA framework. This approach acknowledges the no free lunch theorem, which suggests that no single constraint handling technique can universally outperform others across all problem types and scenarios. The paper emphasizes the adaptability of ECHT across different problem characteristics such as feasibility ratios, problem multimodality, and stages of the search process (global exploration vs. local exploitation). By utilizing every function call effectively across multiple populations, ECHT aims to balance global exploration and local exploitation, crucial for achieving robust performance in constrained optimization tasks. The experimental results presented demonstrate that ECHT consistently outperforms individual constraint handling methods when integrated with evolutionary programming and differential evolution, while remaining competitive with state-of-the-art algorithms in the field. Despite its merits, several considerations should be noted. The implementation of ECHT with multiple constraint handling methods and their respective populations may introduce increased computational complexity and resource requirements compared to single-method approaches. Practical challenges such as parameter tuning across multiple populations and the potential for increased algorithmic overhead need careful consideration. Moreover, while the experimental results are promising, the paper could benefit from additional insights into the scalability and robustness of ECHT across a wider range of benchmark problems and problem dimensions. The general applicability of ECHT to different types of EAs and its adaptability to various problem domains should also be further explored. The comparison with state-of-the-art algorithms could be extended to include more recent advancements in constrained optimization techniques, providing a more comprehensive evaluation of ECHT's performance and practical utility. Additionally, a deeper analysis of how ECHT performs under different constraint violation scenarios or with varying levels of problem complexity would enhance the paper's contribution to the field of evolutionary computation and optimization.

The study by Sriparna Saha 1 , Asif Ekbal [15] This paper addresses a significant problem in Natural Language Processing (NLP), specifically Named Entity Recognition (NER), which is crucial for various NLP applications. It introduces novel approaches to the classifier ensemble problem within both single and multiobjective optimization frameworks. By exploring two versions of the ensemble problem—binary vote based and real vote based—the paper aims to leverage the diverse reliability of predictions across output classes among seven classifiers: Naive Bayes, Decision Tree, Memory Based Learner, Hidden Markov Model, Maximum Entropy, Conditional Random Field, and Support Vector Machine.

The paper's hypothesis—that different classifiers exhibit varying reliability across different output classes—is insightful and forms the basis for constructing effective ensemble systems. By evaluating these techniques across three resource-constrained languages (Bengali, Hindi, and Telugu), the study provides comprehensive results demonstrating the efficacy of their approach. Notably, using multiobjective optimization (MOO), the proposed ensemble achieves impressive recall, precision, and F-measure values across all languages, surpassing both individual classifiers and baseline ensemble methods. Despite its contributions, the paper could benefit from further elaboration on several points. Firstly, while the results are promising, a deeper discussion on the generalizability of the proposed techniques to other languages and domains would enhance the paper's applicability. The reliance on feature representations identified without domain knowledge or language-specific resources raises questions about the robustness of the approach across different linguistic contexts or more complex NLP tasks. Additionally, the computational complexity and scalability of the proposed ensemble methods, especially in resource-constrained environments or large-scale NLP applications, merit attention. Practical considerations such as parameter sensitivity, training time, and memory usage should be thoroughly addressed to facilitate adoption in real-world NLP systems. Further insights into how the ensemble methods perform under scenarios of data imbalance or noisy inputs would strengthen the paper's findings. Moreover, comparisons with recent advancements in NER and ensemble learning techniques could provide a more nuanced understanding of where these methods stand relative to state-of-the-art approaches. Finally, discussing potential limitations or challenges encountered during the experimental setup and proposing strategies for mitigating these issues would enhance the paper's overall contribution and applicability in the field of NLP and machine learning.

# PROTOTYPING

# METHODOLOGY

# OBSERVATIONS

# RESULTS & DISCUSSIONS

##### Acknowledgment *(Heading 5)*

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##### References

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For papers published in translation journals, please give the English citation first, followed by the original foreign-language citation [6].

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