**SIMATS ENGINEERING**
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TECH STAR SUMMIT 2024

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# Predicting Accuracy For Automated Aero Assist Recommendation Using Random Forest And Compared With Naive Bayes With Improved Accuracy

## INTRODUCTION

➢ The study evaluates the predictive accuracy of Random Forest versus Naive Bayes algorithms for automated aero assist recommendation, aiming for improved accuracy

➢ The research's application lies in enhancing the accuracy and reliability of automated assistance systems in aviation, optimizing flight trajectories, minimizing risks.

➢ Random Forest utilizes ensemble learning to construct multiple decision trees, offering robustness against overfitting and efficient handling of high-dimensional data. Naive Bayes classifier, based on Bayes' theorem, assumes independence between features, making it computationally efficient and suitable for classification tasks with large datasets.

➢ Despite previous studies exploring machine learning algorithms for automated aero assist recommendation, a gap exists in understanding the comparative performance of Random Forest and Naive Bayes in this context.



Fig 1:Predicting Accuracy For Automated Aero Assist Recommendation
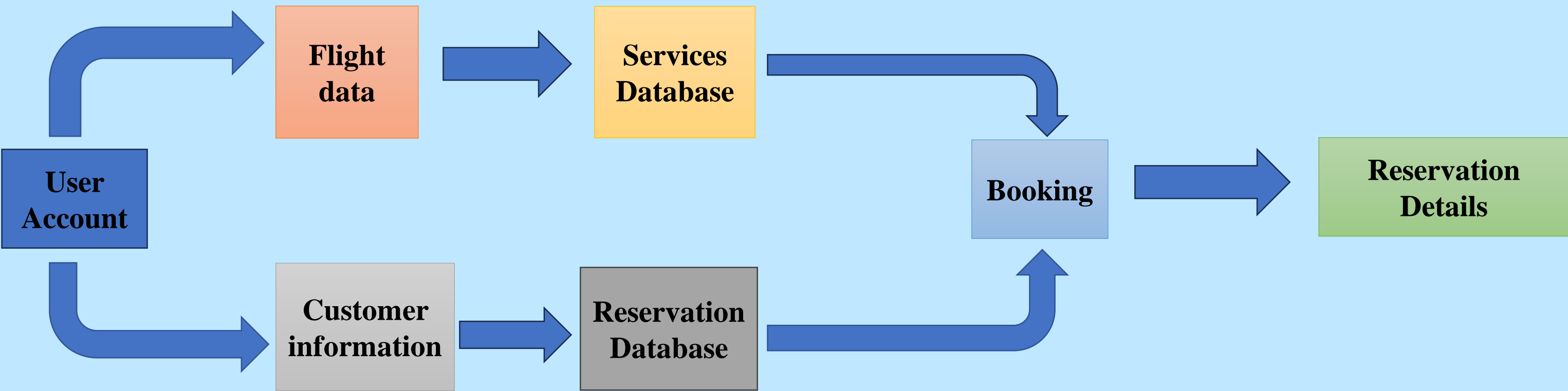
## MATERIALS AND METHODS



Fig 2. Automated Aero Assist Recommendation using machine learning algorithms
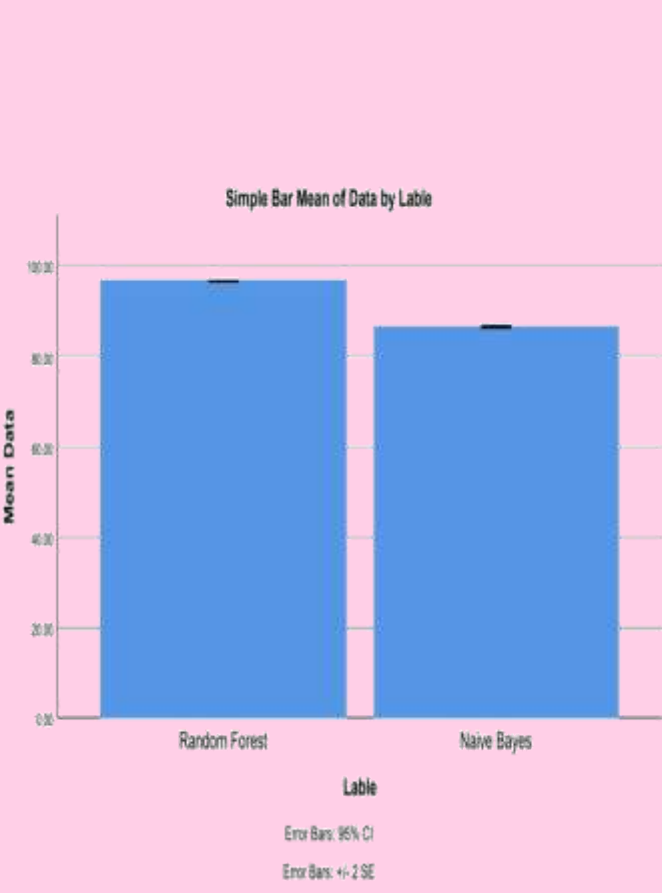
## RESULTS



Fig 3:Random forest and Naïve Bayes

Table 1.Displays the accuracy of Random Forest and Naïve Bayes

| S.NO | Random Forest | Naïve Bayes |
|---|---|---|
| 1 | 96.16 | 86.94 |
| 2 | 96.61 | 86.50 |
| 3 | 96.02 | 86.03 |
| 4 | 96.99 | 86.52 |
| 5 | 96.34 | 86.75 |
| 6 | 96.76 | 86.95 |
| 7 | 96.93 | 86.30 |
| 8 | 96.97 | 86.81 |
| 9 | 96.83 | 86.01 |
| 10 | 96.66 | 86.34 |
| Accuracy | 96.57 | 86.52 |

➢ In, Automated AreoAssist Recommendation Random Forest is compared with Naïve Bayes and it depicts that the RF got highest accuracy than Naïve bayes.

Table 2.Mean table for Random forest and Naïve Bayes

| | Algorithm | N | Mean | Std.Deviation | Std . Error Mean |
|---|---|---|---|---|---|
| Accuracy | Novel Random Forest | 10 | 96.57 | 0.145 | 0.046 |
| | Naïve Bayes | 10 | 86.52 | 0.346 | 0.109 |

➢ Group statistics of accuracy for the Novel Random Forest and AdaBoost Classification Algorithms . The above Novel Random Forest has 96.57% accuracy the Naïve Bayes has 86.52%.

## DISCUSSION AND CONCLUSION

➢ By independent sample test, there is a significant difference in accuracy attained by the algorithm is 0.0016($p<0.05$).

➢ The research with the help of machine learning methods revealed that the Random Forest algorithm perform 96.57% better that the Naïve bayes 86.52%.93.43%, Which had an accuracy of 92.37%.

➢ Implementing study findings could revolutionize aviation by enhancing safety and efficiency in flight planning and assistance.

➢ Limitations may arise from increased computational complexity with Random Forest compared to Naive Bayes, potentially affecting real-time implementation.

➢ Random Forest's feature importance ranking facilitates the identification of influential variables in aero assist recommendations.

➢ Overall, the study underscores the potential for Random Forest to improve the accuracy and reliability of automated assistance systems in aviation, potentially transforming safety measures and operational efficiency in the aerospace industry.

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