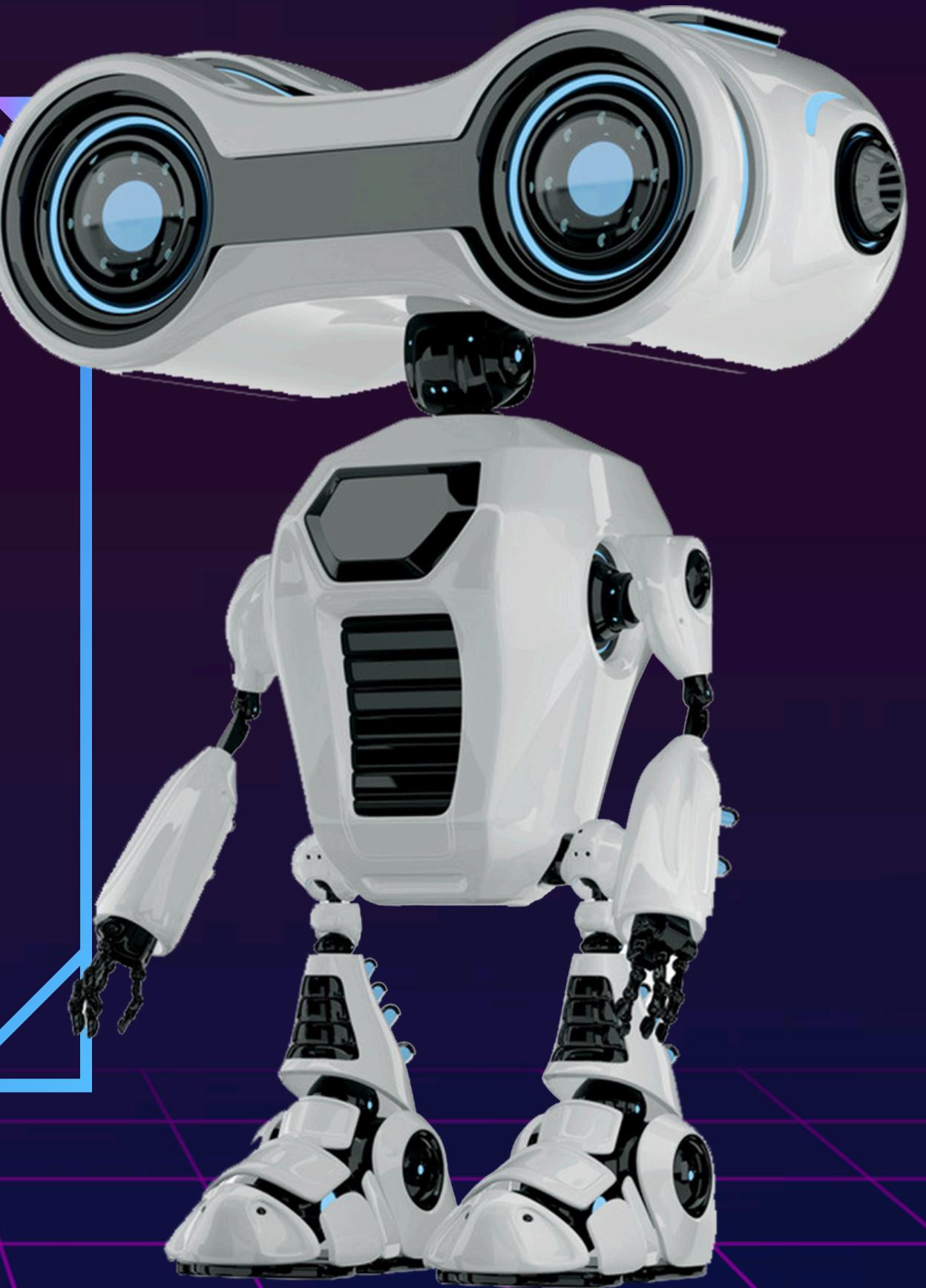


# AI-POWERED HEART DISEASE DETECTION SYSTEM

# PROBLEM STATEMENT

- **Key Challenges:**
  - Limited access to advanced diagnostic tools in remote areas
  - High costs and complexity of traditional methods
  - Need for accurate, user-friendly, and cost-effective screening tools
- **Impact:** Undiagnosed conditions lead to preventable complications and fatalities



# RELATED WORK

- Summary of existing research and methodologies:
  - **Example 1:** Machine learning-based heart disease models ( by Umarani Nagavelli.)
  - **Example 2:** Comprehensive reviews of ML methods (by Mohammadreza Hajiarbabi )
  - **Example 3:** Real-time health monitoring and AI (by Shadman Nashif)
- **Gap Identified:** Existing solutions lack a balance of accuracy, accessibility, and affordability for widespread adoption



# PROPOSED METHODOLOGY

## Algorithms Used:



**Logistic Regression:** Chosen as a baseline model due to its simplicity and interpretability, making it easier to explain predictions and validate results in a healthcare context.



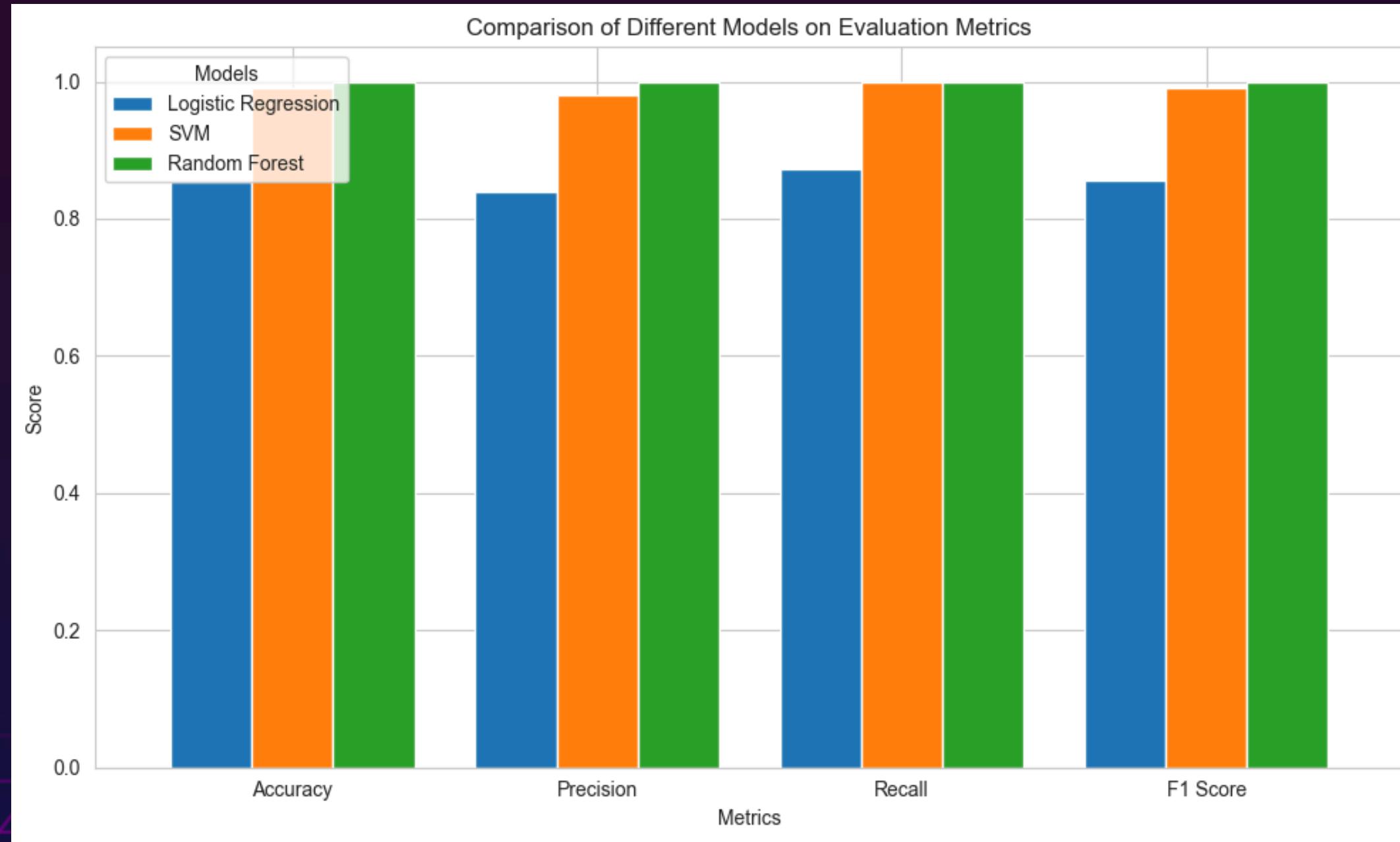
**Support Vector Machines (SVM):** Opted for its effectiveness in high-dimensional spaces and its robustness in identifying optimal decision boundaries, particularly for non-linear relationships.



**Random Forest Classifier:** Selected for its ability to handle complex, non-linear relationships and to provide insights into feature importance, which aids in understanding the key contributors to heart disease risk.



# RESULTS



# CONCLUSIONS

1

- All three models—Logistic Regression, SVM, and Random Forest—demonstrated strong performance across key evaluation metrics such as Accuracy, Precision, Recall, and F1 Score.

2

- **Accuracy:** SVM and Random Forest achieved slightly higher accuracy compared to Logistic Regression, indicating their superiority in overall prediction correctness.
- **Precision:** Random Forest outperformed the other models in Precision, suggesting it was the most effective at minimizing false positives.
- **Recall:** SVM displayed the highest Recall score, making it the best model for identifying actual positive cases (sensitivity).
- **F1 Score:** Random Forest and SVM were closely matched and slightly better than Logistic Regression, balancing Precision and Recall effectively.



# MEET OUR TEAM



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**THANK YOU**