INFORMATICS INSTITUTE OF TECHNOLOGY

In Collaboration with

UNIVERSITY OF WESTMINSTER

CricIntel: Intelligent Cricket Team Selection and Prediction System

A dissertation by

Mr. Visal Chamuditha Dharmasiri

w1811026 | 20201217

Supervised by

Mr. Nishantha Janith Chandrasena

Submitted in partial fulfilment of the requirements for the

BEng (Hons) Software Engineering degree at the University of Westminster.

April 2025

ABSTRACT

Problem: Selecting the starting eleven for a cricket team is a challenging process that involves weighing individual performance, match conditions, and experience. Current selection algorithms have trouble processing these criteria, which leads to less-than-ideal team compositions. Many algorithms for coaches have poor contextual information integration, which limits their prediction reliability. To address this, CricIntel suggests the optimal lineup based on data-driven insights and machine learning, ensuring greater selection accuracy and adaptability in a variety of match scenarios.

Methodology: The research employed a hybrid methodology that blended machine learning algorithms with contextual decision-making. Random Forest, XGBoost, and a Multi-Input Neural Network analysed player and match data, while a team formation model and a player availability model enhanced selection feasibility. The models were trained using regression and classification techniques on a large dataset. Cross-validation ensured robustness, while feature importance analysis improved interpretability. CricIntel was able to generate highly precise and condition-specific recommendations for the top team using this technique.

Initial Results: CricIntel's models achieved high accuracy in team selection. The Multi-Input Neural Network fared better than Random Forest and XGBoost, with accuracy rates of 97.99% and 98.94%, respectively, with an accuracy of 95.63% (R^2 = 99.10%). The team formation model classified team compositions with 82.31% accuracy, whereas the player availability model achieved 89.49% (R^2 = 99.97%). Cross-validation ensured durability, and confusion matrices confirmed predictions. These results corroborate CricIntel's high projected accuracy, which is always being enhanced to provide more adaptability in a range of match scenarios.

Subject Descriptors:

- Computing methodologies → Machine learning → Machine learning approaches → Classification and regression trees
- Computing methodologies → Machine learning → Machine learning approaches → Neural networks
- Information systems → Information systems applications → Decision support systems → Data analytics

Keywords: Cricket analytics, team selection, machine learning, neural networks