

Gradient Boosting Classifier Summary

The Gradient Boosting Classifier model, optimized through Grid Search, demonstrated solid performance in predicting player skill levels in StarCraft II.

- **5-Fold Cross Validation:** Ensured consistent performance across different data subsets.
- **Optimal Hyperparameters:**
 - Learning Rate: **0.01**
 - Maximum Depth: **3**
 - Minimum Samples Split: **5**
 - Number of Estimators: **200**
- **Outcome:**
 - Best Cross-Validation Accuracy: **39.1%**

Conclusion

The Gradient Boosting Classifier achieved the best cross-validation accuracy, leveraging its ability to focus on misclassified instances during training. While the accuracy reflects the complexity of the dataset and the details of gameplay patterns, the model's iterative learning and fine-tuned hyperparameters ensured a balanced performance. The results emphasize that player skill in StarCraft II arises from multifaceted gameplay interactions, making it challenging to predict with high precision, but the Gradient Boosting Classifier showed the strongest potential among the tested models.