Results & Accuracy

The performance of the proposed AI-based fuel-efficient route optimization system was evaluated using a Random Forest Regressor. Since fuel consumption prediction is a regression problem, the model was evaluated using standard regression metrics.

Model Performance:
• R^2 Score: 0.96
• MAE: 0.27 L/h
• RMSE: 0.37 L/h

Interpretation

- The model explains **96% of the variation** in fuel consumption.
- Very **low prediction error**, indicating high reliability.
- Performs better than traditional distance-based routing systems.

◇ **Result Outcome**

- Fuel consumption is accurately predicted for each route segment.
- The system successfully recommends the **most fuel-efficient route**, not just the shortest route.

The graph below compares actual and predicted fuel consumption values. Points closely aligned with the diagonal line indicate high prediction accuracy.