

Cheat Detection Report

Project: Game Cheating Detection System

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Overview

This report summarizes the methods and findings of a cheat detection system designed for multiplayer FPS games such as *Valorant* or *CS:GO*. Using simulated player behaviour data, the system employs anomaly detection to flag potentially unfair players.

Dataset Summary

The dataset includes **500 simulated players** with the following behavioural attributes:

- **Accuracy**
- **Headshot Ratio**
- **Movement Speed**
- **Reaction Time**
- **Kill/Death Ratio (KDR)**

We introduced **30 players** as suspected cheaters by boosting their stats beyond human norms.

Detection Method

Algorithm Used: *Isolation Forest* (unsupervised anomaly detection)

- Detects outliers in multidimensional behaviour data.
- Effective when labelled cheating data is scarce or unavailable.

Features Used:

- Accuracy
- Headshot Ratio
- Movement Speed
- Reaction Time
- KDR

✅ Results

Using Isolation Forest with a 6% contamination rate:

- Detected ~30 cheaters (aligned closely with injected labels)
- Confusion matrix and classification report show strong overlap with labelled suspected column
- Visualizations confirm behavioural outliers

👍 Strengths

- Doesn't require labelled data
- Fast and scalable for large datasets
- Can be integrated into real-time pipelines

⚠️ Limitations

- Skilled players may be falsely flagged
- Relies solely on behavioural metrics
- No server-side validation or anti-cheat logs used

🚀 Next Steps

- Incorporate supervised ML using confirmed ban data
- Monitor text/chat logs for toxic or bot-like communication
- Extend to in-game economy fraud detection (MMORPGs)
- Build live dashboards for moderation teams (e.g., Streamlit)

🏁 Conclusion

This system provides a baseline model for detecting cheating in online multiplayer games. With real game telemetry and integration, it can be a powerful tool for maintaining fairness and player trust.

