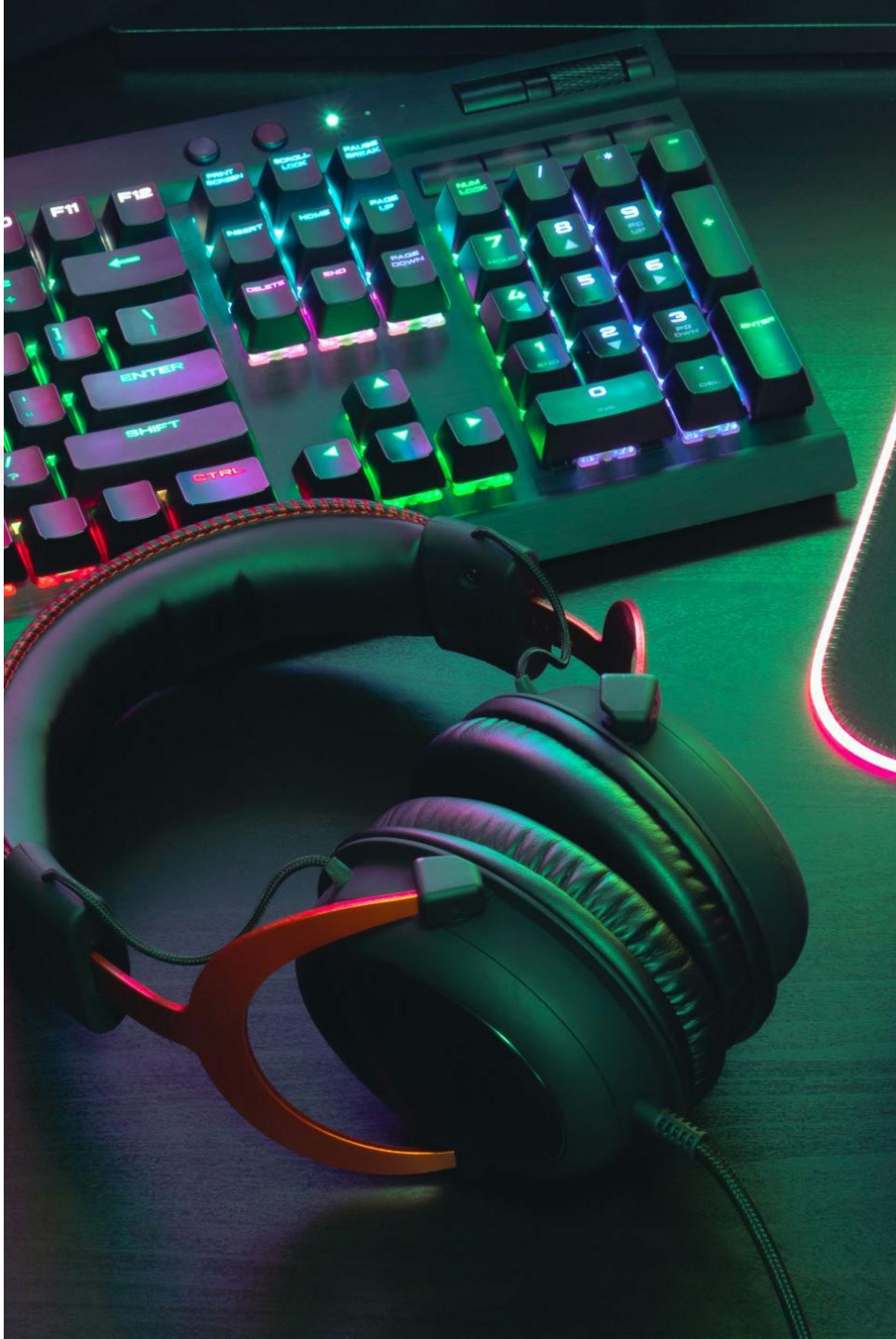
Machine Learning Final Project

Logistic Regression Model

Predicting Video Game Success using ML

Introduction

- Video games are a multi-billion dollar industry
  - Predicting success helps developers and publishers
  - Machine Learning enables data-driven decisions



Project Vision

- Use ML to predict whether a game will be successful
  - Leverage historical video game data
  - Provide insights for future game development

Problem Statement

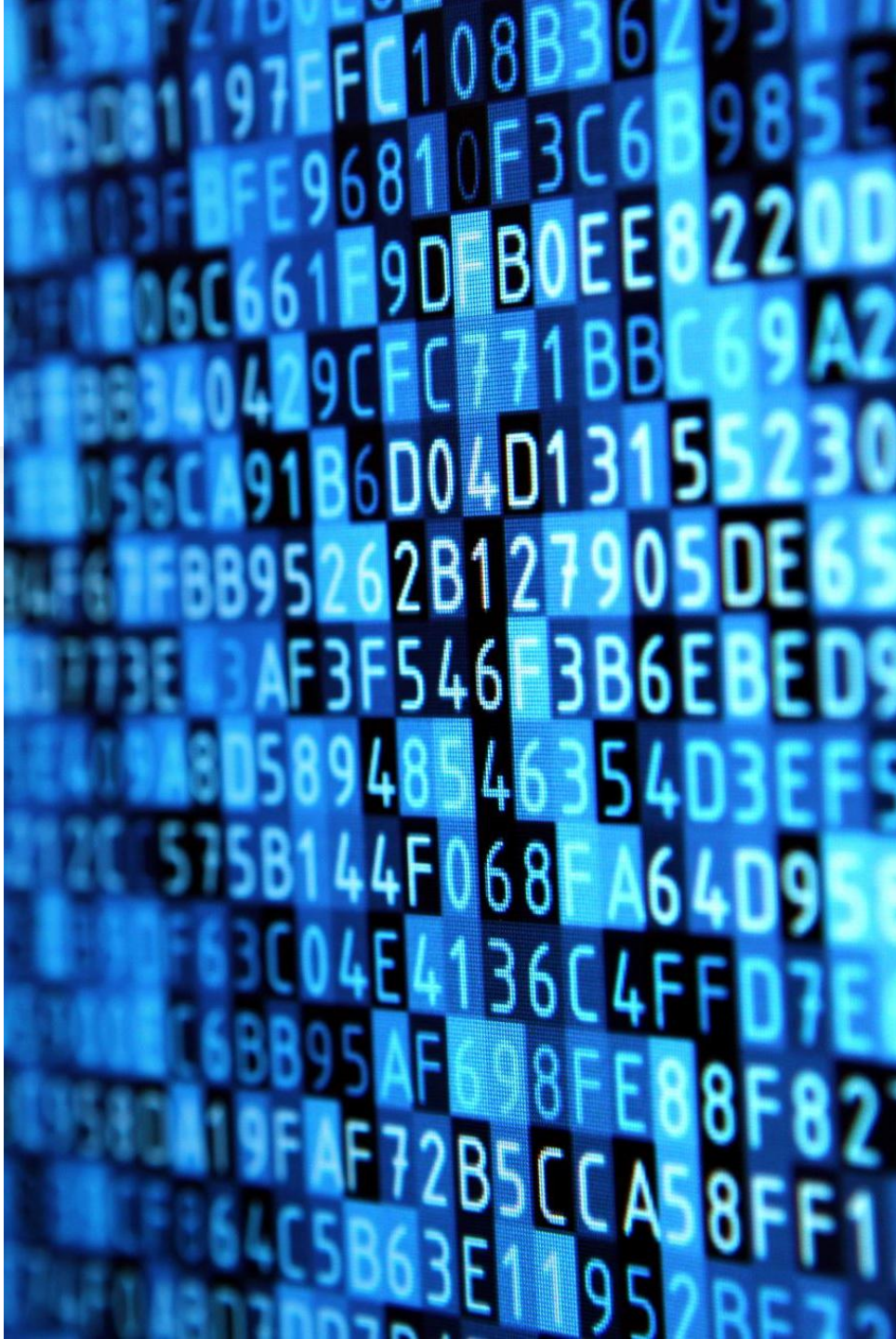
- Game success is uncertain and risky
  - Traditional methods rely on intuition
  - Need a predictive ML-based solution

Objectives

- Analyze video game dataset
  - Preprocess and explore data
  - Train ML model to predict success

Project Scope

- Binary classification problem
  - Focus on structured numerical & categorical data
  - Logistic Regression model

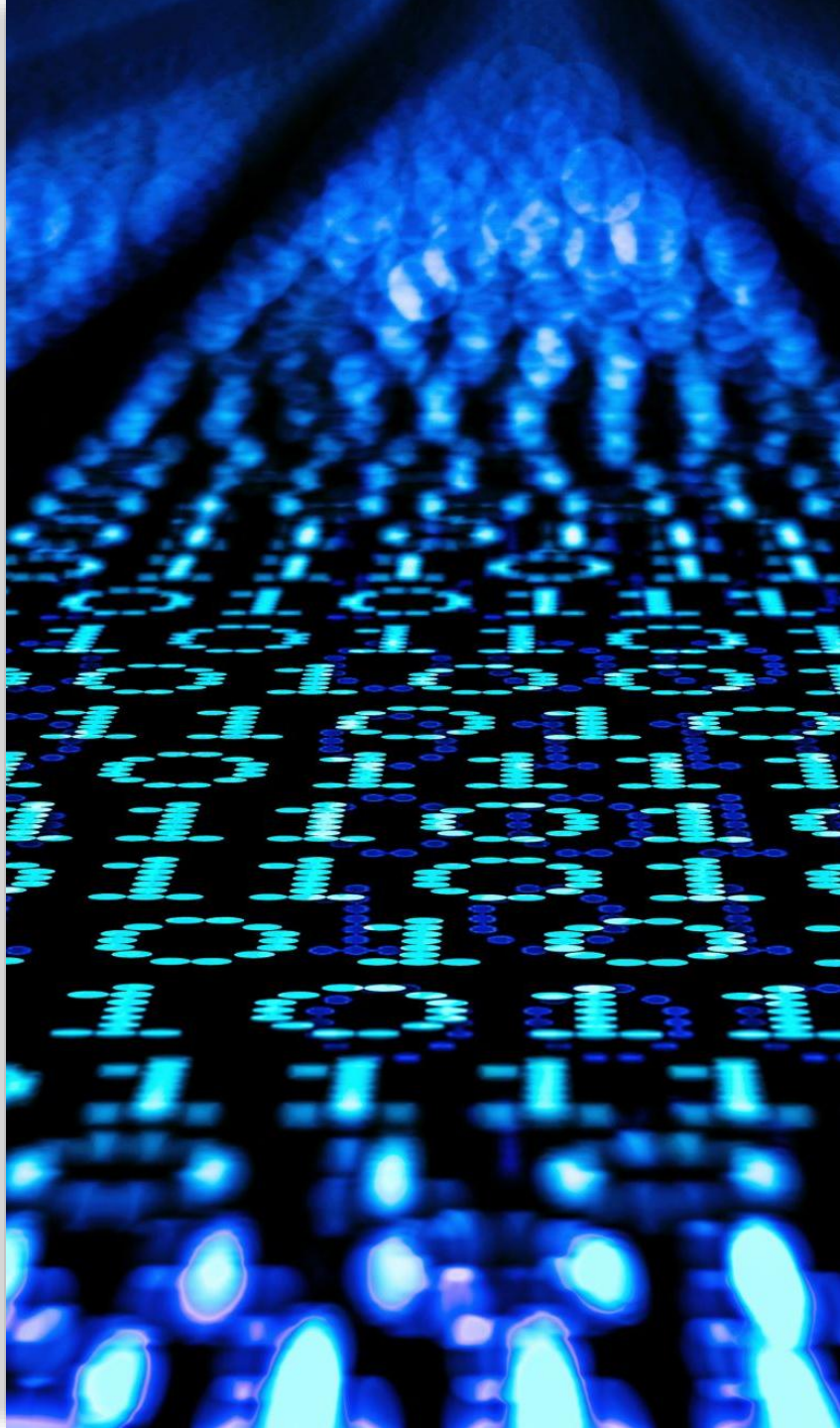


Dataset Overview

- Source: Video Game Sales Dataset
  - Features include sales, ratings, platform
  - Target variable: Success (Hit / Not Hit)

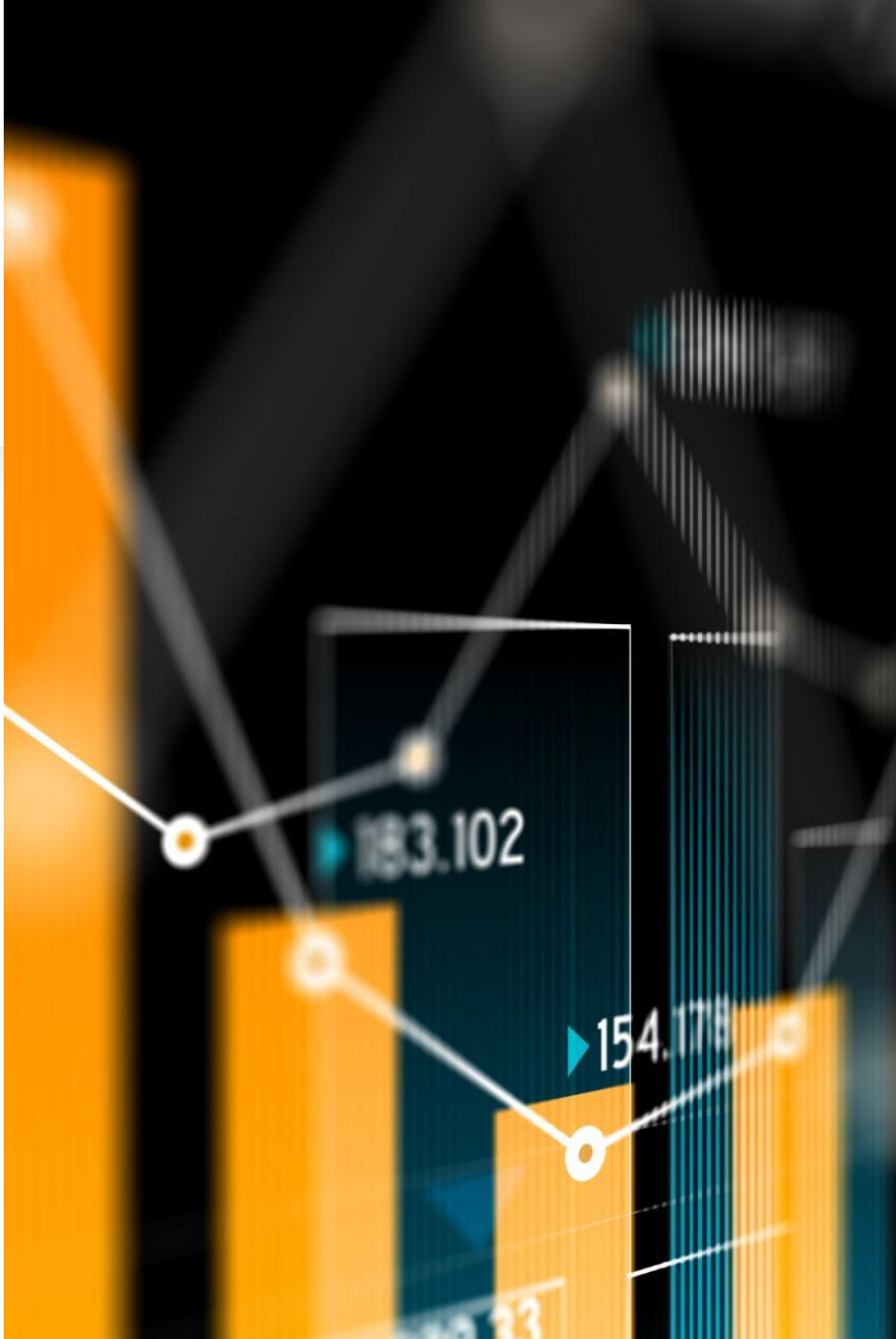
Data Preprocessing

- Handled missing values
  - Encoded categorical features
  - Feature scaling applied



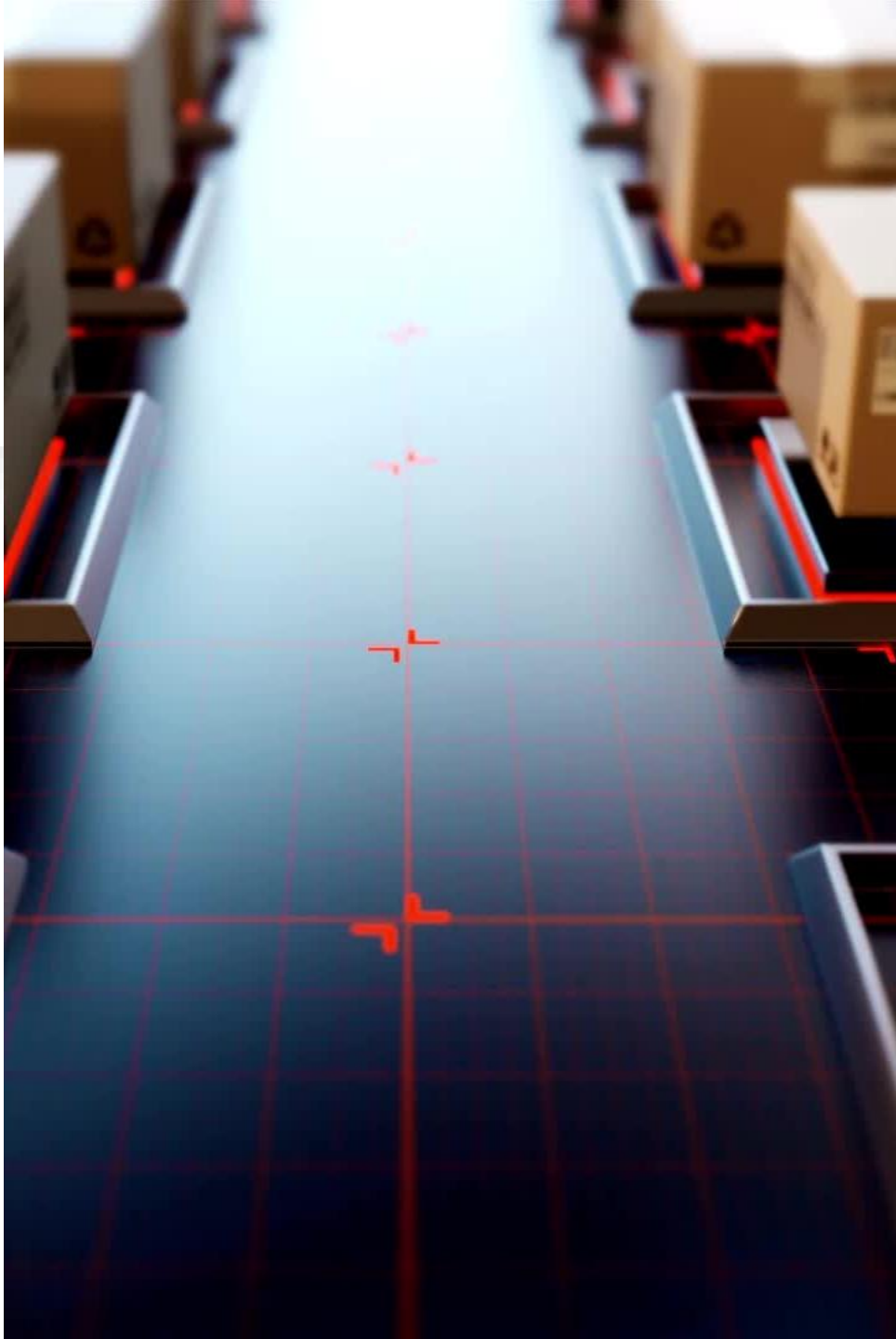
Exploratory Data Analysis

- Sales distribution analysis
  - Platform vs success trends
  - Correlation between features



ML Approach

- Logistic Regression chosen
  - Simple, interpretable, efficient
  - Well-suited for binary classification



Model Training

- Data split into training & testing sets
  - Model trained on training data
  - Evaluated using test data

Accuracy Score

- Accuracy measures overall correctness
  - Model achieved strong performance
  - Indicates reliable predictions

Confusion Matrix

- Shows TP, FP, TN, FN
  - Helps understand classification errors
  - Balanced performance observed

ROC Curve

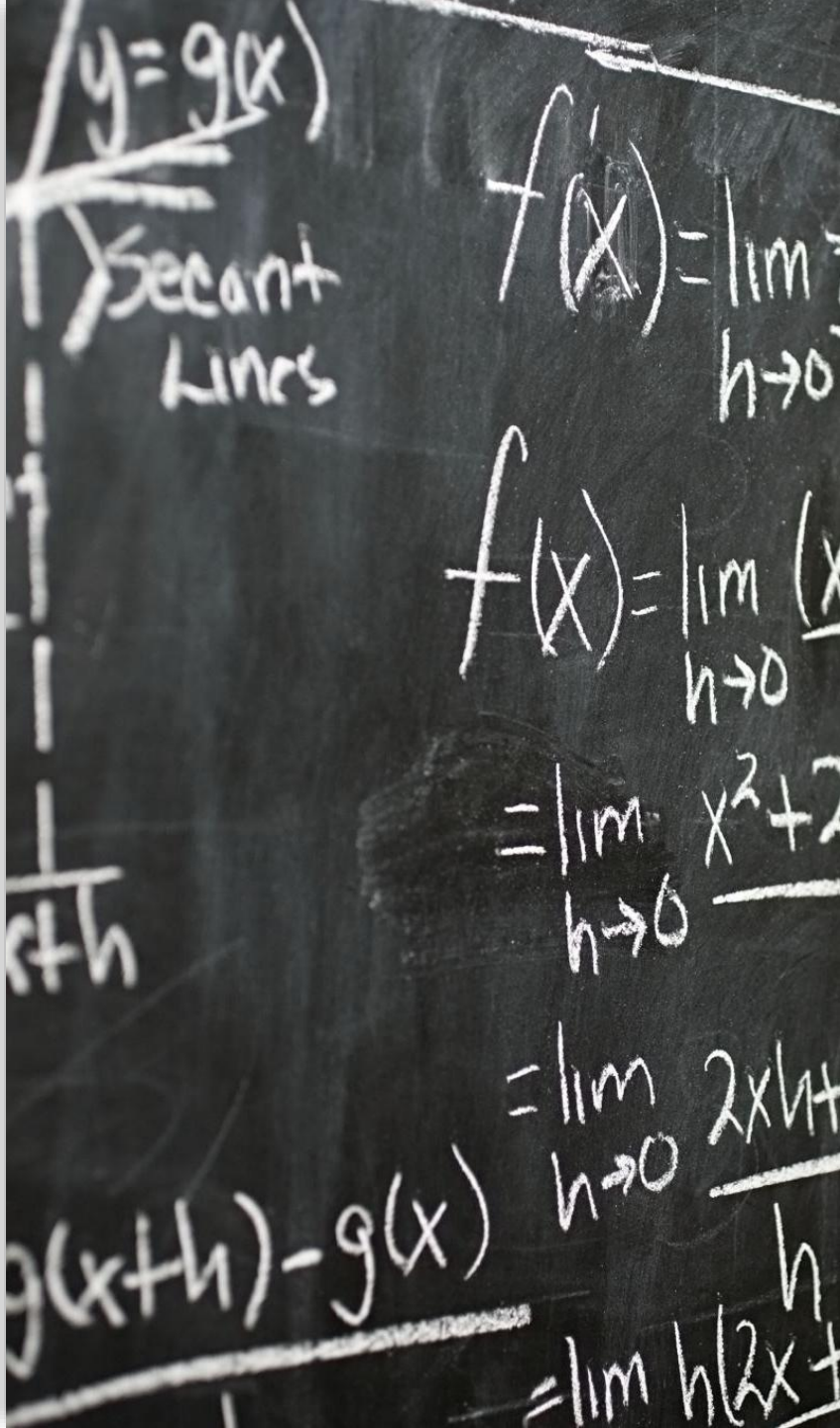
- Plots True Positive Rate vs False Positive Rate
  - Evaluates model discrimination ability

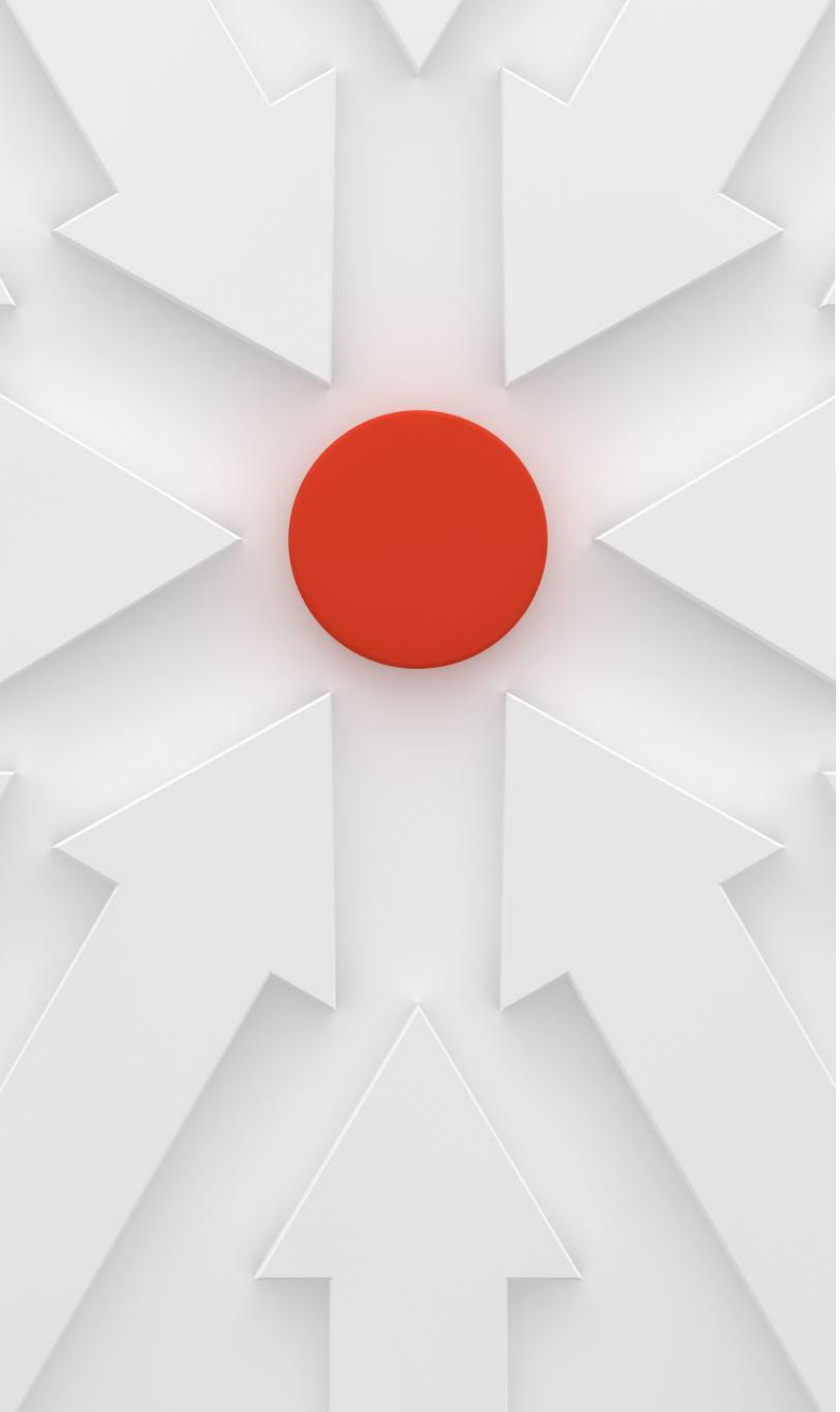
ROC-AUC Score

- Area Under ROC Curve
  - Higher AUC = better model
  - Model shows good separability

predict_proba() Explanation

- Returns probability estimates
  - Useful for confidence-based decisions
  - Not just class labels





Results & Insights

- Certain features strongly influence success
  - ML can assist decision-making
  - Model generalizes well

Conclusion & Future Work

- ML effectively predicts game success
  - Future: try advanced models
  - Include more features & data