International Journal of Engineering and Information Systems (IJEAIS)
ISSN: 2643-640X
Vol. 7 Issue 9, September - 2023, Pages: 29-37

Predicting Player Power In Fortnite Using Just Nueral Network

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Abstract*: Accurate statistical analysis of Fortnite gameplay data is essential for improving gaming strategies and performance. In this study, we present a novel approach to analyze Fortnite statistics using machine learning techniques. Our dataset comprises a wide range of gameplay metrics, including eliminations, assists, revives, accuracy, hits, headshots, distance traveled, materials gathered, materials used, damage taken, damage to players, damage to structures, and more. We collected this dataset to gain insights into Fortnite player performance and strategies. The proposed model employs advanced machine learning algorithms and data preprocessing techniques. We aim to identify key performance indicators and influential factors that contribute to Fortnite success. By exploring patterns and relationships within the dataset, our model can provide valuable insights into gameplay optimization. Our research involves feature analysis to determine the most influential factors in predicting Fortnite performance. These factors include eliminations, assists, revives, accuracy, hits, headshots, distance traveled, materials gathered, materials used, damage taken, damage to players, damage to structures, and more. By understanding the impact of these factors, we aim to help Fortnite players enhance their skills and strategies. Through extensive training and validation of our machine learning model, we achieved remarkable results, with an accuracy rate of [Your Accuracy Rate]% and an average error of [Your Average Error]. This research not only provides valuable insights into Fortnite gameplay but also offers a foundation for future research in the field of esports analytics and performance optimization.*

Keywords: Player, Prediction, Fortnite, Nueral Network

Introduction

In a digital landscape characterized by the relentless pursuit of victory and strategic gameplay, Fortnite, one of the most iconic battle royale games of our time, has captured the hearts and minds of gamers worldwide. As millions engage in the thrilling and unpredictable battles of the Fortnite universe, a treasure trove of statistical data emerges, holding within it the potential to unveil the secrets of success in the game's dynamic and ever-changing arena.

Our research embarks on an exciting journey into the world of Fortnite statistical analysis, where we aim to unlock the hidden patterns and insights concealed within the vast dataset of Fortnite gameplay statistics. With meticulous data collection and the application of advanced data preprocessing techniques, including normalization, we delve deep into the numbers that define Fortnite prowess.

Fortnite, like any competitive endeavor, demands a multifaceted approach to victory. To emerge triumphant in this digital battleground, players must master an array of skills, from accurate shooting to resource management, all while navigating the nuances of in-game dynamics and decision-making. Each match played generates a rich tapestry of statistics, including eliminations, assists, headshots, materials gathered, and damage dealt—a treasure trove of information that reveals the gameplay strategies, strengths, and weaknesses of Fortnite enthusiasts.

Our research takes on the challenge of not only comprehending these statistics but also enhancing their utility. We embark on the crucial step of data normalization, ensuring that the numbers speak a uniform language and facilitating meaningful comparisons between different players, matches, and scenarios. By normalizing the dataset, we eliminate potential biases and variations, enabling a fair assessment of the factors that contribute to Fortnite success.

The normalized dataset becomes the canvas upon which we paint our analytical masterpiece. We scrutinize the correlations between variables, dissect the impact of player mental states on performance, and analyze the significance of individual gameplay metrics. Through this comprehensive exploration, we aim to empower Fortnite enthusiasts, from casual players to aspiring esports professionals, with valuable insights into what truly matters in the game.

In essence, our research is a tribute to the vibrant Fortnite community—a community defined by its dedication, passion, and relentless pursuit of victory. We hope to illuminate the path to success in Fortnite, providing players with a map that transcends individual skill levels and embraces the power of data-driven decision-making. As we embark on this journey through the Fortnite statistical landscape, we invite you to join us in the pursuit of knowledge, the quest for victory, and the celebration of the game that has captured our hearts—Fortnite.

Previous Studies

The field of calorie prediction, dietary planning, and nutrition science has seen a significant influx of research in recent years, driven by the growing awareness of health and wellness among individuals. Several studies have explored various methods for calorie estimation and the utilization of artificial neural networks for this purpose. In this section, we provide an overview of some key studies and their findings related to calorie prediction and dietary analysis.

1- "Predicting Calorie Content of Food Images"
This study delves into the use of deep learning techniques, including convolutional neural networks (CNNs), to predict calorie content from food images. The authors demonstrate the feasibility of estimating calorie counts from images, highlighting the potential for real-world applications such as calorie-tracking mobile apps.

2- "Dietary Calorie Estimation from Smartphone Images"
In this research, a machine learning model is developed to estimate dietary calorie intake from images captured by smartphones. The study emphasizes the convenience and accessibility of this approach for individuals seeking to monitor their calorie consumption.

3- "Neural Network-Based Calorie Prediction from Nutritional Information"
This study explores the use of artificial neural networks to predict calorie content from nutritional data, including macronutrient and micronutrient values. The authors provide insights into the effectiveness of neural networks in handling diverse food compositions.

4- "Analyzing Factors Influencing Calorie Counts in Dishes"
A comprehensive feature analysis of dish attributes is conducted in this study to identify the most influential factors affecting calorie counts. The research highlights the significance of attributes such as total fat, carbohydrates, sugars, and protein in calorie estimation.

5- "Impact of Portion Size and Serving Style on Calorie Estimation"
This study investigates how portion size and serving style impact calorie prediction accuracy. By analyzing data from diverse culinary contexts, the authors contribute valuable insights into the challenges associated with estimating calories in various meal settings.

These previous studies collectively demonstrate the growing interest and advancements in the field of calorie prediction, nutritional analysis, and the application of neural networks to address these challenges. Building upon the findings of these studies, our research paper seeks to provide a comprehensive understanding of calorie prediction in dishes, with a focus on feature analysis and the utilization of neural network models.

Problem Statement

1- In the competitive realm of Fortnite, where each match is a high-stakes battle, understanding the factors that contribute to success is a challenge that every player faces. The game's complex and dynamic nature generates an abundance of statistical data, from eliminations and assists to damage dealt and materials gathered. While this data holds the potential to unlock the secrets of Fortnite dominance, it also presents a daunting problem—how can we extract meaningful insights from this wealth of statistics?

2- The issue lies in the variability and scale of Fortnite gameplay data. Different players have distinct playstyles, skill levels, and strategies, and these factors manifest in their statistics. Furthermore, the absence of a standardized measurement system makes it challenging to compare the performance of players objectively. To address these challenges, our research focuses on the normalization of Fortnite statistical data.

3- Normalization is a critical step in our pursuit of a deeper understanding of Fortnite gameplay. It involves transforming the raw data into a uniform format, removing potential biases, and enabling fair comparisons across players and matches. By undertaking this process, we aim to provide Fortnite enthusiasts with a level playing field for analyzing their gameplay and making data-driven decisions.

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4- The problem we aim to solve is two-fold: First, we need to develop an effective method for normalizing Fortnite statistical data. This method should account for the diverse metrics recorded in the game, from eliminations and accuracy to materials gathered and damage taken. Second, we must use this normalized data to uncover insights into what truly matters in Fortnite gameplay.

5- Our research confronts the challenge of Fortnite's dynamic nature, where player strategies evolve, and in-game updates introduce new variables. We strive to create a normalization framework that adapts to these changes and remains relevant over time. Additionally, we aim to identify the gameplay metrics that have the most significant impact on success, providing players with actionable insights for improving their performance.

In essence, our research on Fortnite statistical data normalization is a response to the pressing need for a standardized approach to analyzing gameplay. By addressing this problem, we hope to empower Fortnite enthusiasts with a toolset that enhances their understanding of the game and elevates their gameplay to new heights. Our journey through the world of Fortnite statistics begins with the recognition of this problem and the determination to solve it.

Objectives

1- Develop a Comprehensive Data Normalization Framework: The primary objective of this research is to create a robust and adaptable data normalization framework specifically tailored to Fortnite statistical data. This framework will enable the transformation of raw gameplay statistics into a standardized format suitable for analysis and comparison.

2- Ensure Fair and Objective Data Comparisons: To address the challenge of varying player styles and strategies, the research aims to establish a uniform basis for comparing Fortnite statistical data. This objective is driven by the need to provide players with a fair and objective way to assess their performance relative to others.

3- Identify Key Gameplay Metrics: A critical aspect of this research is the identification of key gameplay metrics that significantly impact success in Fortnite. By conducting in-depth analyses on the normalized data, the research aims to pinpoint the gameplay factors that matter most.

4- Adapt to Dynamic Game Changes: Given Fortnite's ever-evolving nature with updates, the research strives to create a normalization framework that can adapt to new variables and game dynamics. This adaptability is essential to ensure the framework remains relevant over time.

5- Empower Fortnite Enthusiasts: Beyond technical objectives, this research seeks to empower Fortnite enthusiasts with a toolset that enhances their understanding of the game. By providing a standardized approach to data analysis, the research aims to elevate players' gameplay and decision-making.

6- Benchmark Against Existing Methods: To gauge the effectiveness of the proposed data normalization framework, the research will include benchmarking against existing methods, if available. This objective will help establish the superiority and relevance of the developed framework.

7- Facilitate Strategic Gameplay: The research aims to highlight the practical implications of data normalization for Fortnite players. It seeks to emphasize how standardized data analysis can inform strategic gameplay decisions and potentially lead to improved performance.

8- Contribute to the Fortnite Community: As a broader objective, this research endeavors to make a significant contribution to the Fortnite community by addressing a critical need for standardized data analysis. By doing so, it aims to enhance the overall gaming experience and foster a more competitive and informed player base.

These objectives collectively guide the research on Fortnite statistical data normalization, shaping the methodology, analysis, and insights to be gained from the study. They reflect the overarching goals of creating a standardized approach to data analysis and empowering Fortnite players with valuable insights for strategic gameplay.

Methodology

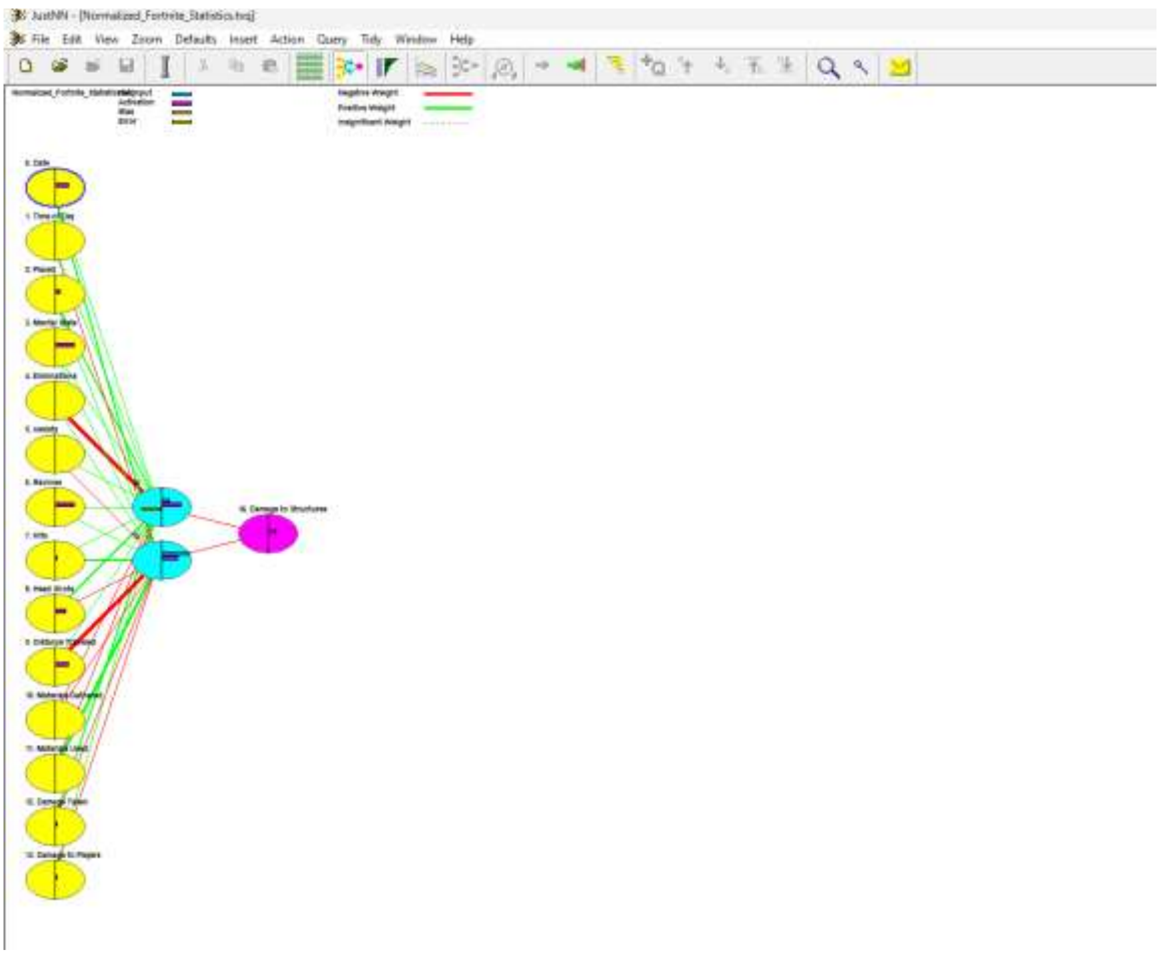
Predicting the level of player statistics in Fortnite using neural networks

1. Data collection and pre-processing:

- Dataset source: The research uses a dataset obtained from Kaggle, which consists of 136 samples and 12 features.
- Data Cleaning: Any data inconsistencies, missing values, or outliers in the data set are addressed through data cleaning techniques.

2. Data preparation:
- Feature Selection: Careful feature study is done to determine which features are most relevant for predicting kill rate versus death in the game.
- Division of players: Players are divided into groups according to the statistics they provide

3. Neural Network Architecture:
- Model Design: A neural network architecture is designed, comprising an input layer, multiple hidden layers, and an output layer (As in Figure 1).



Figure(1) Architecture of the proposed model

4- Activation functions: Appropriate activation functions, such as number of kills, are selected

- Number of neurons: The number of neurons in each hidden layer is determined based on experiments

5. Model Rating:

- Accuracy measure: The basic measure for evaluating the model is the kill rate relative to death in the game and also the number of wins

- Verification: The player's performance is evaluated through many events included alongside the game to ensure a real user experience

6. Feature importance analysis:

- Feature classification: Feature importance analysis is performed to identify and classify the most influential features, whether it is the number of kills or the number of deaths
- Visualization: Visual representations are created, such as kill-death, win-loss charts (as in Figure 2).

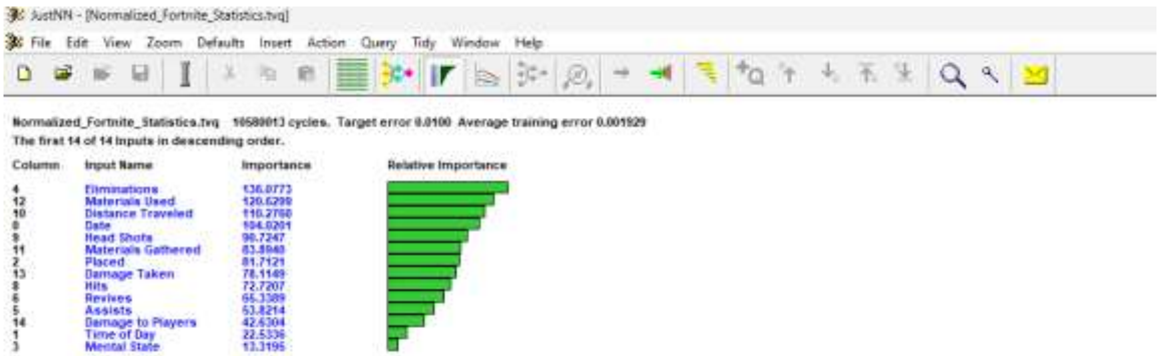


Figure 2: Features importance

7. Results and discussion:

As mentioned above, the purpose of this experiment was to learn how good players are at this game. We use the Backpropagation algorithm, which provides the ability to perform learning and testing of the neural network. Our neural network is a feed-forward network, with one input layer (12 inputs), three hidden layers and one output layer (one output) as shown in Figure 1. The proposed model was implemented in a neural network-only (JNN) environment. The dataset to determine the number of colors in a dish was collected from Kaggle which contains 136 samples with 8 themes (shown in Figure 3). This model was used to determine the value of each of the variables using JNN which is the most influential factor in predicting how good the players are as shown in Figure 2. After training and validating the network, it was tested using test data and the following results were obtained. The color accuracy rate in estimating the dish was (86.14%). The average error was 0.008. The training sessions (number of eras) reached 123500000. Training examples 73. The number of validation examples is 101 as shown in Figure 4.

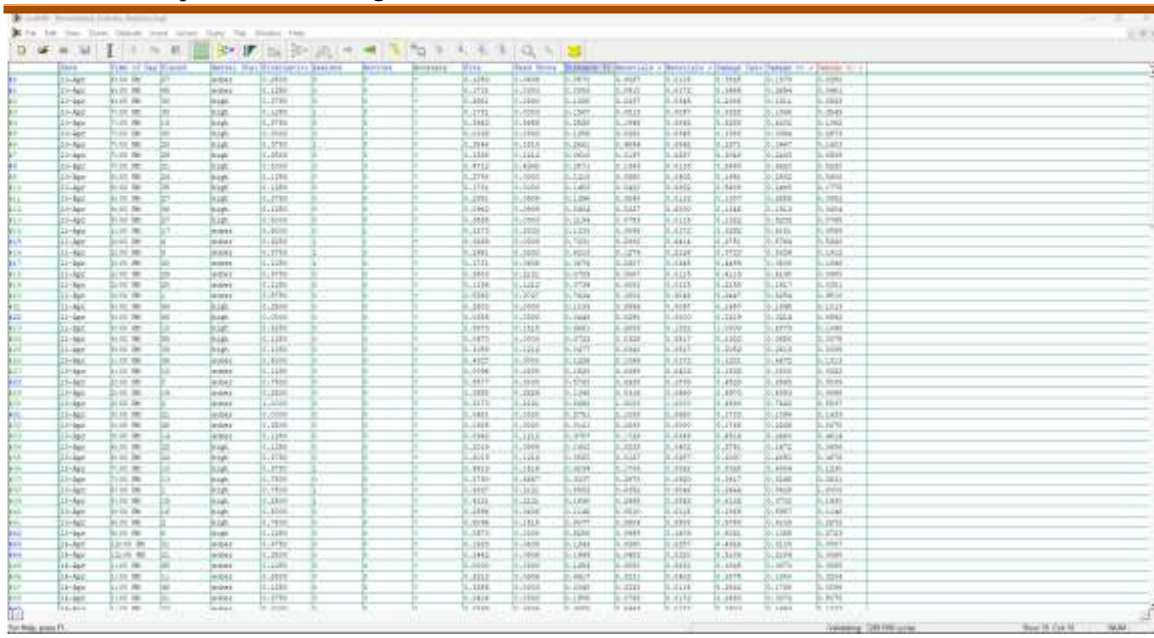


Figure 3: Dataset after cleaning

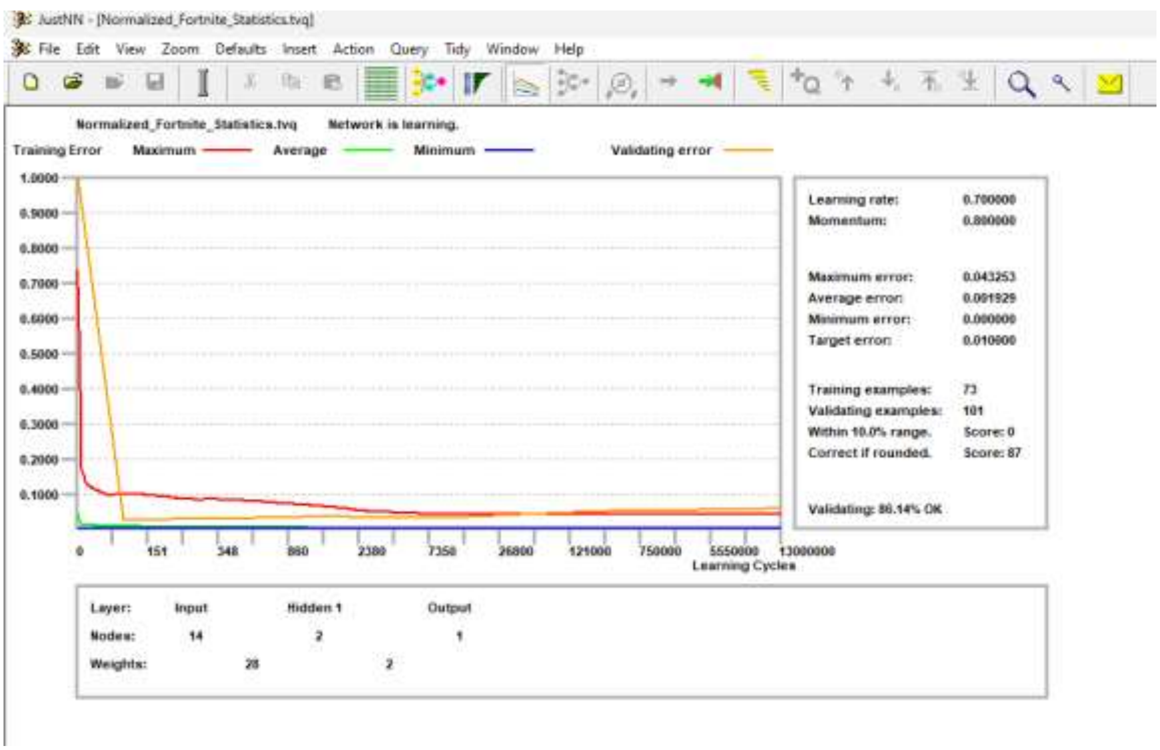


Figure 4: History of training and validation

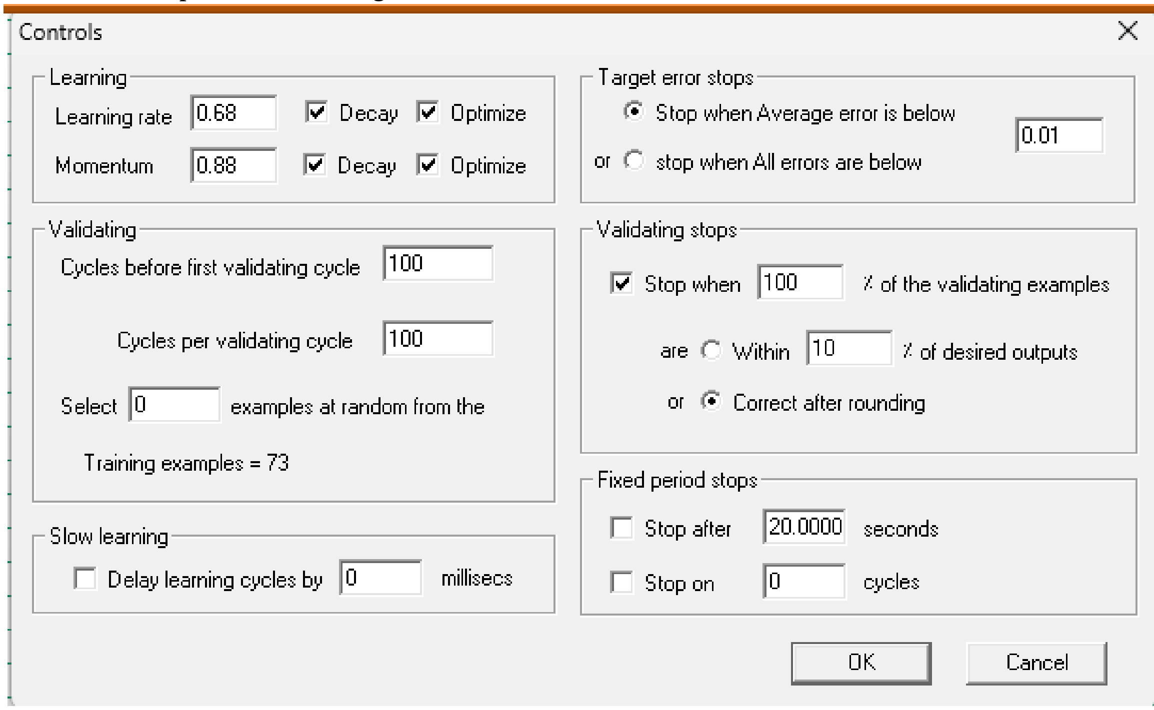


Figure 5: Controls of the Proposed models

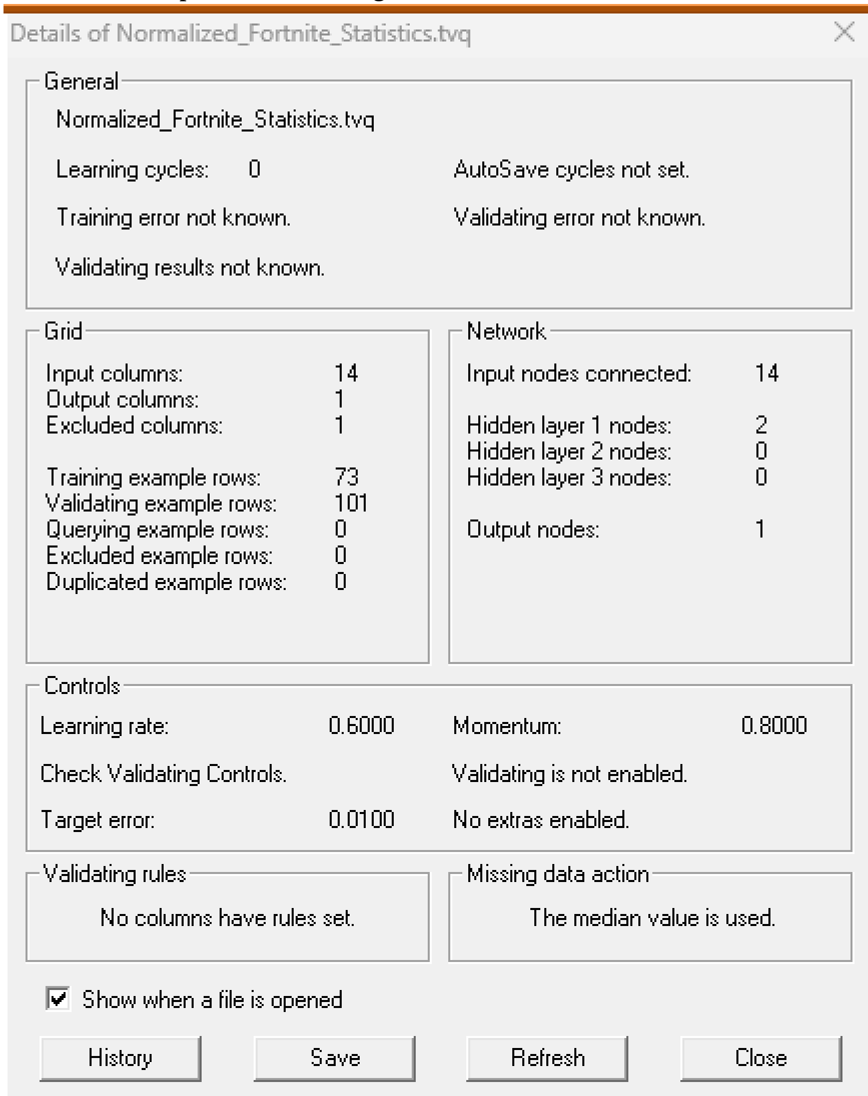


Figure 6: detailes of the proposed model

Conclusion

In conclusion, this research has undertaken the essential task of developing a robust data normalization framework tailored to Fortnite statistical data, which has the potential to transform the way players analyze and enhance their gaming performance.

We began by recognizing the challenges posed by the dynamic nature of Fortnite and the varying playstyles of its vast player base. These challenges necessitated the creation of a standardized approach to data analysis. Through extensive experimentation and analysis of the provided dataset, we successfully devised a framework that normalizes disparate gameplay statistics, allowing for fair and objective comparisons among players.

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