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USER MANUAL

IMPROVING FITNESS WITH DATA

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Contents

Welcome to the User Manual for our application designed to revolutionize the way you analyze and enhance your training activities! With this application, you can effortlessly upload your training data recorded with a smartwatch and gain invaluable insights about your physical condition and performance. We have created a user-friendly interface that provides two distinct sections, each serving a unique purpose to help you maximize your training potential.

In the first section, we have leveraged the power of Artificial Intelligence (AI) to analyze your uploaded data and infer how your last week's training routine will affect to your future performance. This AI-driven analysis takes into account various factors such as heart rate, distance covered, intensity of workouts, and more, enabling you to make informed decisions and adjustments to your training routine.

Moving on to the second section, we understand the importance of interactive visualizations when it comes to understanding and analyze registers of data. Our application offers a range of aesthetically pleasing and informative displays that make your data come to life. You may easily analyze and interpret the results of your training activities using these interactive visuals. From comprehensive charts showcasing your performance evolution over time to correlation between numerical variables recorded during a training session, you will have access to a wealth of information that can aid you in setting realistic goals and tracking your progress effectively.

Our application makes an exhaustive analysis of each user's data to provide a customized interface for each user profile. With its combination of AI-powered insights and interactive visualizations, you may gain a deeper understanding of your training activities and thus, make informed decisions for your future training routine.

In this user manual, we will guide you through every step of using our application, from the initial setup to uploading your training data, using the AI component, and interacting with visualizations. Let's dive into this steps and unlock the full potential of your training activities!

1 Registration

1. Access the provided link of the application.
2. On the home screen, find and select the *New User*option to activate it.
3. Create a unique username and a strong password.
4. Click on *Regiser* button.

If you have followed the steps correctly, the application will inform you that the user creation process has been successful. Next, deactivate the *New User* option and proceed to access the application using the username and password you have just created.

When you enter the application you will see that there are three pages: Main page or set up, prediction page and visualization page. You must correctly fill the set up before using the other two pages.

2 Main Page: Set up

The purpose of this page is to customize the interface according to each user's profile. It tries to identify the optimum AI model taking into account your own data.

READ AND CLEAN THE DATA

Before you start using the application, you will have the option to choose between two types of databases: a completely new one or an already stored database. If you are a new user, select the first option.

Next, the option to upload a .csv file from your local computer will be enabled. This file should contain all your recorded training activities and it must meet the requirements specified[1]. It is important that the file meets these requirements, otherwise the application will not be able to correctly process your data. In addition, you can specify which smart watch you use if the option appears.

Once you have selected and uploaded the .csv file, the application will start a data cleansing process. During this process, you will be shown informative messages about how your data is being processed.

As the data cleansing process is a bit exhaustive, the first time that users load their data, the application may take long to determine that the data has been correctly read. From that moment on, the system stores, on the one hand the cleaned databases, and on the other hand the cleaning steps applied in the cache. By doing this, if users load again the same data, it will not consume as many resources to clean it. In addition, users have the option at any time to download the cleaned databases.

When the cleaning process is finished, the application will inform you about it, and the cleaned database is automatically stored in the cloud. From this point on, you will be able to download the cleaned database, as well as the cleaned database grouped by weeks.

[1] A PDF specifying the database requirements can be downloaded from the application.

TRAIN THE MODEL

After the data is properly processed by the app, the next step is to train the model. The purpose of this model is to determine whether the last week's training routine has been positive, negative or maintenance with respect to the following week's performance.

During this stage, you can set certain requirements for the model's metrics, such as a minimum level of accuracy or recall [2]. The app will then proceed to test multiple classification models with various configurations until it finds one that meets the specified metrics.

You also have the option of setting a maximum time limit for the model search. If the time limit is reached and a suitable model has not been found, the app will stop the search. In such cases, you may need to adjust your requirements for accuracy or recall, and search for a model with lower performance standards.

After successfully finding a suitable model, the app will display various detailed metrics, including the confusion matrix and F1 score. This allows you to thoroughly evaluate the model's performance and determine whether it meets their expectations. If you are satisfied with the model, you must save it by clicking the *save* button. Then, this model will be used in the subsequent sections of the app.

It is important to note that you can always access and review the metrics of the saved model.

Up to this point, you can use all the functionalities of the application.

3 Prediction page

This page uses the pre-trained and stored AI model. It allows you to load data from your last weekly training routine and visualize how it will affect your fitness in the following week. To use it, follow the following steps:

Firstly, your are required to input your new training activities, making sure that there are no null values and that the data is within the specified metrics.

To continue, click on the *Done* button. This will lead the application to process the data that you have just entered and use the AI model to display the corresponding results week-by-week. You will see the following:

- Gauge chart: This shows your weekly fitness percentage, which is calculated by comparing your past week's training to your overall fitness history. This comparison evaluates your current physical condition with your personal best and worst levels.
- Label of the week: It can be either positive, or negative, or maintenance. This is the effect on your future performance.
- Recommendation messages: helpful suggestion message about your training routine that may help you improve your performance.

[2] The definition of these metrics are detailed in the application

Finally, you have the option to save the displayed results. Saving them will also add the newly reported activities to the stored database. This is especially useful because as the database grows, you can go back to the main page and use the *saved data option* to find a model with better metrics.

Also, on this page you will find the option to view the results of previous weeks by expanding the *See previous weeks* bar.

4 Visualization page

This page provides some visualizations that may help you gain insights from your recorded activities. Graphics about the evolution of the performance, maximum and minimum peak of physical condition, correlations between features and your performance, clustering of training periods, so on.

It is worth noting that all the visualizations are automatically updated when the you save new data to the currently saved dataset, hence you have access to the most up-to-date information about your performance and accordingly use it to make informed decisions.

Getting into more detail, the visualizations are the following:

- PERFORMANCE OF EVOLUTION: This is a line plot that shows the user's performance according to their training activities for the specified year. Performance is explained to the user, and the visualization allows them to identify patterns in the data and clustering of training periods.
- ACTIVITIES COUNT: These are a bar and a clustered bar charts that show the number of activities for each activity type and month. This visualization helps the user identify patterns in the data, such as their preferred activity types.
- SUMMARY OF NUMERICAL FEATURES: These are a bar and a clustered bar chart that show the total amount of a specified numerical feature for each activity type and month. For instance, this visualization allows the user to identify which activity types they have spent more time on (if the numerical feature is time), or which activity types allow them to cover more distance (if the numerical feature is distance).
- CORRELATION ANALYSIS: These are a scatterplot and a heatmap. The first one shows the correlation between two numerical features specified by the user, filtered by activity type. The second one shows the amount of a numerical feature for each activity type and month. These visualizations help the user understand and discover correlations between numerical features.
- DISTRIBUTION ANALYSIS: This visualization includes a box plot that shows the mean and standard deviation for a specified numerical feature, and a histogram that shows the distribution of the feature, filtered by activity type. This helps the user understand the distribution of numerical features and identify any outliers or rare values.

5 Contact Information

If you have any questions, please do not hesitate to contact the creators at carlamiquel-blasco2001@gmail.com