

Software Used As Tactical Tool and of Training for Table Tennis

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Abstract: A common technique for evaluating the performance of a player is to count the errors and successes in a match, this can be automated with an auxiliary software installed in the laptop of the coach of a player, and it can be used as tactical tool and of training, for the account of each type of error and/or success, for example drive vs underspin; topspin vs topspin; or any another combination that the coach choose. In this way, the coach can get instantaneous statistics of errors and/or successes; and therefore to suggest the adequate changes to improve the play of the player or for to obtain better results in the scoreboard in a tournament match.

With this software, the coach only needs to type in the name of each type of error and/or success to count, in each button; and it starts counting. For each type of error/success there is: one button; one counter per each game and a total counter. Also for each counter there is a percentage indicator. In this way, the coach can see the quantity and the percentage of errors and successes: per type; per each game and for the entire match, it making clear where are the weakness and fortresses of his player, in order to propose tactical changes in a match or specific exercises in training sessions with the goal of to improve the play of his player.

The same buttons and counters are available for both players of a match; therefore it also can be used in order to find the weaknesses of the opponent player and to take advantage of these.

This auxiliary software stores the sequence of accounts and (if is available) the scoreboard sequence in a Microsoft Access type file; therefore the entire information can be reviewed and analyzed later. It can be used in tournaments or in training sessions together with, or without, the electronic scoreboards. It can be used periodically to see the evolution of the player.

The use of this software together with electronic scoreboards, has benefits as: a special computer connected to the network and to internet, it can automatically broadcast the scores from all the tables to the entire world through internet; anyone with a laptop connected to the local network and with special software, it can receive all the scores or only one in particular.

This software is ready to receive the scores from any electronic scoreboard (any table) interconnected to the network, complementing the information of the counters with the information of the scoreboards.

Keywords: Tactical Tool and of Training, Auxiliary Software, Electronic Scoreboard.

1. INTRODUCTION

One of the techniques for the evaluation of the performance of a player is to count the quantity of successes and errors versus different types of strokes received in a match, with this, beside of evaluating; we can see which strokes are necessary to correct and to practice.

This same technique can be used in a tournament match, since upon knowing the weak strokes, it can be established or to modify the tactic of play to minimize the effect of this and for to take advantage of the more effective strokes.

Normally the coach or an auxiliary person can be taking note manually of these counts, it writing points or lines in a paper, for each type of error or success, and then to observe where there are more density of marks, it detecting thus the weak and/or strong points.

Just like the video, the use of computers and of

special application software is something very common in our days. Although the video is of great utility, cannot to provide numerical statistic neither standing out immediately the strong and weak points of a player, but computer software can do it: to provide immediately numerical statistics.

In this work we developed computer auxiliary software for carryout the accounts described previously and additionally to do some basic statistics that will be useful for the coach but for him would need time to do, and the time is very limited in a tournament match. Therefore this software simplifies the work of the coach and improves the support given to the player.

This software beside was designed thinking in the use of electronic scoreboards as the introduced in the 10th SSC of 2007 [1], for simultaneously to receive the score of the game, it adding this information to the errors counters and filing in the hard disk of the computer, for

later review; analysis or simulation of replay of the match.

With the correlation of the information from the scoreboard with errors and success counters, we can find any possible emotional or psychological relation, if the errors are frequently happening in special situations, as in the last points of each game or in the critical points. In this way we can evaluate if is necessary to improve the psychological aspect and self confidence of the player.

2. SOFTWARE DESCRIPTION

This software was made in Visual C, it using Microsoft Visual Studio [2], to be run in Windows over PC, it utilizing a simple to use interface and friendly for the user.

The screen that shows this software is divided in 3 principal sections:

- Scoreboard Section;
- Player 1 Counters Section;
- Player 2 Counters Section;

In the following paragraph are described each one of these sections.

2.1 Scoreboard Section

The central part of the screen of this software was prepared to show the information from the scoreboard. Here we can choose and show: the number of table; the names of the two players (one row for each player) and the current game number. For each player it is shown: the server player; the current scoreboard; the total games won and the current and final score for each game.

The table number is chosen using two buttons, one button is for increase the table number and the other is for decrease. The initial table number shown is the number 1. Upon electing the number of table, if the computer is connected to the scoreboard network, automatically it will receive the information of the score from the electronic scoreboard in the chosen table.

In order to receive the current count from the scoreboard chosen, it is necessary to have an interface board that connects the PC to the scoreboard network. In the case of the electronics scoreboard from the reference [1], a CAN interface is needed.

The figure 1 shows the scoreboard display section.

| Table | Points | Sets | Set1 | Set2 | Set3 | Set4 | Set5 | Total Games | Duration |
|-------------------|--------|------|------|------|------|------|------|-------------|-------------------|
| Table 1 | 9 | 2 | 4 | 11 | 11 | 9 | | 15/30 | 11:55:11 00:01:45 |
| Roberto Hernández | 5 | 1 | 11 | 4 | 4 | 6 | | 30/50 | |
| Antonio López | | | | | | | | | |

Fig. 1 Scoreboard Display Section.

Also here some numerical data are observed that are calculated automatically with the information received from the electronic scoreboard. These values shown in the last 3 columns are: the points won with the own service over the number of own services done, this

information is for each player. This is a similar data upon showing in the tennis matches, where it is common to show the efficiency of the first service. The penultimate column shows the time of the last point counted. The last column shows the total duration of the match.

If the computer is not connected to the scoreboard network, there are 2 buttons to increase the counts of points for each player. Also there are buttons to increase and decrease the current game number. These buttons are not needed when the information is received through the electronic scoreboard network.

When the computer is connected to the network, this section is useful by it self, to see the scoreboard of the table selected and for file the sequence of points. In this way, this software could be used without utilizing the sections of counters of errors and successes.

2.2 Counters Sections

Each one of the 2 sections of counting (one for each player) is divided in 2 subsections:

- Subsection for the counters of successes;
- Subsection for the counters of errors.

For each subsection of counters of errors and successes there are several lines, where each one of these lines contains a text indicator where should be typed the name or description of the error or succeed to count.

Just to the right side of this name, is an account increment button. To the right side of this button, is the display of the total current count of this concept during the entire match, along with the percentage value of this account with respect to the total current sum of the subsection, that is to say of all the types of errors (or of successes) of a player.

More to the right side is the display of the account of this same concept (error or succeed) but now divided for each game, and now the percentage shown is that of the account for each game in relation to the total of that concept during all the match (with respect to the information from the first column). With this, we can observe the changes that are occurring during the match and in each game.

The figure 2 shows a line of the described display. The headers for each column are the same that for the central section (scoreboard section)

| | | | | | | |
|----------|------|------|------|------|------|------|
| Errors 2 | 0/0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
|----------|------|------|------|------|------|------|

Fig. 2 A Line of the Counter Section.

The lines or rows are placed in groups of errors and groups of succeeds for each player, conforming the subsection mentioned previously. This is useful for the calculation of the percentages described in past paragraphs, as it is shown in the figure 3.

| Errors 2 | | | | | | | |
|----------|---|------|------|------|------|------|------|
| | + | 0/0% | 0/0% | 0/0% | 0/0% | 0/0% | 0/0% |
| | + | 0/0% | 0/0% | 0/0% | 0/0% | 0/0% | 0/0% |
| | + | 0/0% | 0/0% | 0/0% | 0/0% | 0/0% | 0/0% |
| | + | 0/0% | 0/0% | 0/0% | 0/0% | 0/0% | 0/0% |

Fig. 3 Subsection of Set of counters.

The figure 4 shows the full section of counters, where it can be seen the 2 subsections of errors counter and successes counter.

| Errors 2 | | | | | | | |
|---------------------|---|-------|--------|-------|--------|------|------|
| F-Loop vs Underspin | + | 8/66% | 4/50% | 2/25% | 2/25% | 0/0% | 0/0% |
| B-Loop vs Underspin | + | 0/0% | 0/0% | 0/0% | 0/0% | 0/0% | 0/0% |
| F-Top vs Loop | + | 2/16% | 1/50% | 1/50% | 0/0% | 0/0% | 0/0% |
| B-Top vs Loop | + | 2/16% | 1/50% | 1/50% | 0/0% | 0/0% | 0/0% |
| Successes 2 | | | | | | | |
| F-Loop vs Underspin | + | 4/57% | 1/25% | 2/50% | 1/25% | 0/0% | 0/0% |
| B-Loop vs Underspin | + | 1/14% | 1/100% | 0/0% | 0/0% | 0/0% | 0/0% |
| F-Top vs Loop | + | 1/14% | 0/0% | 0/0% | 1/100% | 0/0% | 0/0% |
| B-Top vs Loop | + | 1/14% | 0/0% | 0/0% | 1/100% | 0/0% | 0/0% |

Fig. 4 Section of Set of counters.

The figure 5 shows the full screen that this software display.

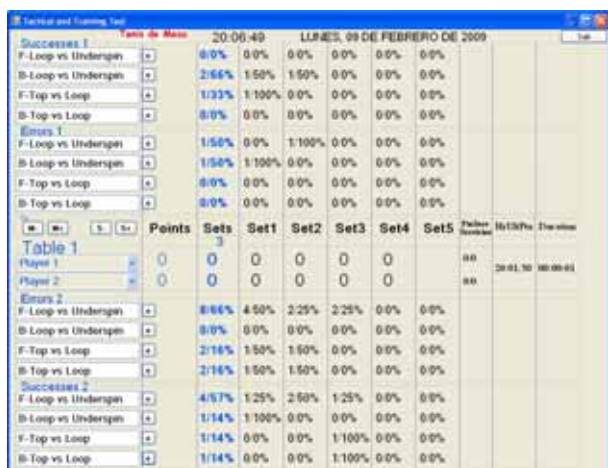


Fig. 5 Full Display.

In the upper part of the figure 5 it observes the section of counters for successes and errors of the player 1. It can see that is divided in the successes counter part and in the errors counter part.

In the central area it observes the scoreboard section and in the lower parts the section of the counters for the player 2.

In parallel to the displaying of all the information in the screen, it is saving in a file of Microsoft Access type, the counting sequences beside with the time (hour:min:seg) when each point occurred.

The format for each register in this file is shown in the Table 1.

The register file is useful for to do later analysis of the information and also to “replay” a match.

When the error counters are correlated with the real and current scoreboard, in the post match analysis of the

file is when also can be detected if the errors are occurring in special situations, as at the end of a game or in very important points. This could be an indication of lack of self-esteem and bad self confidence of the player. In consequence it can be suggested special session for personal development and self-esteem for improve the self confidence of the player or to propose training match with specific handicaps or with similar conditions as the conditions occurring in a real tournament match where it has been detected the higher frequency of errors.

Table 1 Register File Format.

| Register Number | |
|-------------------------|-------------------------|
| Time | |
| Name of Player 1 | Name of Player 2 |
| Total Games of Player 1 | Total Games of Player 2 |
| Game 1 (Score) | |
| Game 2 (Score) | |
| Game 3 (Score) | |
| Game 4 (Score) | |
| Game 5 (Score) | |
| Counter S1 of Player 1 | Counter S1 of Player 2 |
| Counter S2 of Player 1 | Counter S2 of Player 2 |
| Counter S3 of Player 1 | Counter S3 of Player 2 |
| Counter S4 of Player 1 | Counter S4 of Player 2 |
| Counter E1 of Player 1 | Counter E1 of Player 2 |
| Counter E2 of Player 1 | Counter E2 of Player 2 |
| Counter E3 of Player 1 | Counter E3 of Player 2 |
| Counter E4 of Player 1 | Counter E4 of Player 2 |

Also it can be seen if the errors are concentrated at the end of the match or when some time of play has elapsed, it suggesting bad physical preparation of the player.

3. FUTURE IMPROVEMENTS

In this first version of this software, are included basic statistic calculations that are of utility for the coach and for the player.

Surely there are many others calculations that can be of great utility. Each coach could have some specific algorithm or equation that is useful for him, but it is hard to calculate and to use in a real tournament match, because the calculation time that it can be needed.

When these calculations are programmed in a computer, they are no taking time for the coach, because are made instantaneously giving immediately results; therefore they can be utilized in a real tournament match.

In consequence of all things mentioned previously, this software is open to receive any suggestion for changes and improvements from the coaches or even from the mathematical specialist interested in the sport (table tennis).

Mathematical calculations as the standard deviation; varianza; interpolation and prediction methods as square minimums, etc., it can be programmed for use it in a

practical and fast form, it giving results for table tennis. Even with only the information of the scoreboard, it could try to do some calculations; predictions or estimations.

Another change or improves that can be done to this software, is that the results in place (or beside) of been shown in numerical form, it will be shown in graphical form (a graph say more than one thousand numbers), it making easier the observation of trends by the coach.

In future versions of this software will be included graphs, also as the most outstanding suggestions that we receive. The reader is invited to send suggestion to change and to improve this software.

The distribution of the information in the screen, also can be modified in order to do more easier to read for the coach.

Also we will do software version for use in PDA equipment, which for its lower size than a laptop, are easier to carry.

4. CONCLUTIONS

This is the first version of computer software that takes advantage of the use of electronic scoreboards and statistic calculations and simple mathematics, for to evaluate and help to improve the performance of the table tennis sportsman.

The only thing that is needed is that the coach or an auxiliary person introduce the initial data to the software (table number; names of the players and the names for each error and success that will be counted) and after that only needs to go pressing the buttons to increasing for each error or success to count. It doing this it will be showing continuously the accounts and the percentages of errors and successes for the entire match and also for each game.

Even that the video is of great value for the study of the play of a player, it is not common to utilize it during a real tournament match in order to give statistics results instantaneously. Because this software shows instantaneously results during a real match, it is of great utility to help to propose tactics for the play, because it shows the strokes with more success and in consequence to take advantage of these strokes. Also after it has been seen the strokes with higher number of errors, the tactic can be changed to modify the trend to make those errors and to minimize its effect.

Also it is useful to help to propose routines and training programs in order to correct the strokes that are more commonly failed in a match.

In the training sessions, this software can be used periodically in order to see and to file the player evolution and the effect that the training makes over him.

This software also can be utilized uniquely for to receive; to show and to file the information of an electronic scoreboard from a selected table in the network of electronic scoreboards.

The use of auxiliary software and of electronics scoreboards in a network gives the opportunity of applications that will help to the growing and the

development of the table tennis.

REFERENCES

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