

"Design a equipment to monitor the amount of instantaneous velocity of a punch straight characteristic wireless transmission"

DR/ khaled abd elmowgoud abd elazeem

introduction :

Longer sports movement is a universal language, And her vocabulary and sentences paraded-sections and rules recognized And also her their nature birth and their charters and laws of, And where innovation and the creativity that astound crowd around the the whole world The mediator in the levels of of performance skill to find beyond a shadow a reasonable doubt Of science achieved a great dart is still hurdling in the increase to achieve the greatest progress , And plays a a fundamental role ambitious its scientists to rely on modern sciences to be the ones to the beginning advance, To measure the the progress or the development of this the terrible so it was a necessary for the existence of tools of the measuring the underlying the technicians trainers to accomplish operations of measurement accurately and speed of , But rather it goes beyond the this guidance and characterization , And so do all the developed countries,

research centers and laboratories in the sports world Europeanisation, I have put Egypt on the international sports the map strongly in the recent obtaining of Egypt Ali many Olympic medals and the global as well as the of regional and continental, And to achieve more and knowing the current state of our players when you these achievements To maintain it and increase it we had to establishment of laboratories and scientific instruments sports in various aspects related to the sports the domain (nom- physically- Physiology of- mechanically and also psychologically) And that is based on such an equipment Dhua selected elite Academy and athletic of experiences and Laboratory Practice also of those in charge of training coaches .

So is of work as a coach is critical in the development of the boxer and the understanding of the possibilities of the trainee guide it to improve the skills of

boxers, Due to the preoccupation the boxer compete with it usually does not realize the mistakes committed by the inside the loop, and the coach sees things outside the ring can not see from the mistakes of the boxer's art movements (4 : 1).

Has been shown that the study of the technical performance in the sport of boxing must be the evaluation of mechanical of construction of the art movements In terms of the direction and speed and muscle and shared angles during the performance of the punches (1: 192).

Problem and importance of research :

The sport of boxing sports that depend on the modified their performance technical educational observation by the coach at the Sports Club and a teacher at the school in order to try stand on weaknesses and strengths of the track kinetic , This is due to the lack of boxing to scientific instruments, which are built on a scientific basis and low cost . So popped the urgent need for a means by which to measure help coach, teacher and player

in the evaluation process directly and objectively.

Evaluation and measurement of the variables in any of the fields is accurately the main objective works on improving operations of training , And thus athletic achievement for the player if any progress and the discovery of sports the talents depends heavily on the progress of the means of a calendar and measuring the its variables, accuracy and quality.

Calendar and depends on the measurement directly. Without measuring the evaluation process is not possible and without Calendar no feedback and without feedback no knowledge of the results and without results can not improving of performance Longer so measurement is the basis for the aforementioned, so workers can be brought Biomechanics of scientific service help to achieve the perfect performance of activities and Athletics especially sport of boxing (2:2).

The speed of the variables kinetics important in the sport of boxing, which guide us to the relationship between the increase in

distance for the increase in time and by which they can find acceleration thus a predictable force in terms of mass and their distributions across the various stages of the performance of the kinetic , May there were many methods of measuring speed the mismatch the indirect method, which depend on an analysis by the image analysis software , May specially prepared for that and this method depend on the mathematical equations and thus has the ratio of cumulative error resulted from way in the of differential extraction of mechanical variables , As well as the errors and photography cameras limited in terms of the and potentials number , So the governance on motor performance in this way give us a inaccurate information as she not offer us direct measurements thus can not the coach the way to provide immediate feedback during training , So initiate the mind of a researcher to think seriously in finding a means to measure are built on the basis of properly scientific and geometric by relying on a set of sensors The monitor arm which can the striking from the beginning until the end of the

of performance to have high capacity to monitor the amount of instantaneous velocity of a punch straight in the head and which give us direct measurements of enables immediate to intervene of the coach to handle the order that request it .

importance of research :

It can be said that the proposed system will be implemented so that the resulting the objectives that have been set which is :

- measure the speed of the punch is full accordance with the characteristics of the technically straight punch .
- Ease of sensors and put it relates to.
- An appropriate system for trainees in terms of the lack of external Telecommunications .
- Precision in motion tracking using ultra-sensitive electronic circuits and speed .
- Ease of interaction with the students through the design of an efficient an interface program.
- The financial cost low compared to existing systems.

The research aims :

- You could to measure the amount of instantaneous velocity in the light of the

characteristics of the technically straight punch ?

- You could pick up the electrical signal (analog) wirelessly and converted into numeric values ?

- Are there any statistically significant difference between the averages of three attempts each individual in the values of instantaneous velocity of a punch straight ?

- Are there any statistically significant difference between the averages of the different weight categories in the values of instantaneous velocity of a punch straight ?

Research procedures :

- Research method:

The researcher used the experimental method due to the its relevance to the nature of the search .

The research sample :

The research sample been chosen and deliberate in the manner, which were represented weights of in Lightweight - medium and heavy-above average and above and heavy due to the different velocity the punch they have totaling (5) members by 3 attempts each individual bringing the number of attempts to (15) attempt .

Data collection tools :

To collect data for research resorted researcher to scientific studies that addressed the measuring equipment speed as a study (3), (4), and some experts and international arbitrators, Faculty of Engineering and references engineering to get to know the scientific basis from which to design sensors according to the objective and research questions that seek to achieve researcher.

- Design a device to monitor the amount of instantaneous velocity of the punch characteristic wireless transmission (design researcher)

First: The Scientific Basis Engineering who built the equipment designer attic idea

Process includes designing any device or machine to perform a particular function on a number of stages started characterization of the problem, which includes accurate description of measuring speed in the light of the nature of the track motor of the punch and the basis of which is the selection

appropriate materials for the parts of different shape these parts, which ensures speed measurement on the basis of scientific geometrical consistent with the nature of the performance without a breakdown of the equipment . So support the scientific basis for a designer to use a range of measurement sensors, To determine the coordinates of the various positions of the points placed on the striking arm to track a moving body's, and so on three axes (X. Y. Z), where these sensors are installed Has placements varying distances where the installed 20 sensor 2 is based on the number of wood a distance of 5 cm between the sensor and the other, where these sensors relate to a central control unit using electronic processors (switch power supply), (data causation), As can be reach these sensors wired to a centralized unit lying directly above this unit with a wired computer unit) Where the from which to control movement and use of various transactions . Accuracy

and follow up motion sensors will be used for high-resolution so that they can track the speed of any movement in parts of the Milli meters in order to track the instantaneous velocity in the narrowest spaces and less time as possible , As well will use the central controller high speed so that it can receive data from all sensors at each operating cycle and sent to centralized computer unit at high speeds from which to track the dynamic movement.

The software package is implemented by the following :

- Building a variety of programs to do the different functions required in the proposed Movement Control System.
- Implement a range of programs for the organization of contact with the sensors and the central control unit.
- Building programs calculate the transactions from the different sensors readings.
- Building programs to interact with the user (user interface) to facilitate the communication process and data extraction system for the user and student.

the Second components of the equipment designer :

form (1) The first element: sensors form (1)

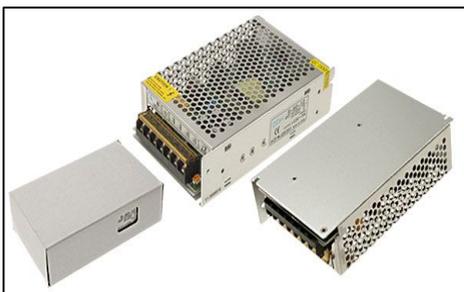


A voltage which need him sensors used 10-30 volts and this should be-voltage constant (DC) so it's best to rely on electric current home and do not use batteries shipping to ensure that no sags and then can influence the values extracted, as a term which captures the movement of the faithful the sensor 5 cm to 30 cm, also read a dependent on transmitted light from the sensor, which observed up to the body, which would be reflected back to the sensor .

Second element: (switch power supply) form (2)

form (3)

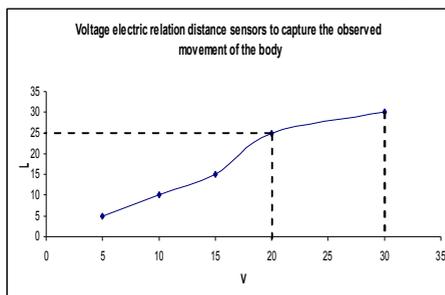
ange of motion of the Sensors)



Must be voltage inside his voltage Home which is 220 volts and out Monnet 12 volts, a continuous stream (DC) in line with the sensors note of the Lien DC has Qillah (+, -) must be Curve private in a straight line any effort circuit fixed Malk prefer to rely on (DC) because he is a continuous electrical current is that of Advantages, as was the use of 2 (power supply) to get 24 volt extractor them in order to be able to sensors get larger extent motor from which to track the moving object and graph (3) shows us that distance.

form (2)

switch power supply(

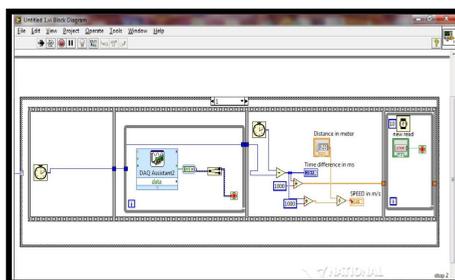


The third element: (data causation)

Features an 8 entrances Digital signals changing you feel rings loading also 8 outputs Digital howl digits (0.1) expresses zero for not reading the device and expresses No. 1 on the reading device, It also features data causation existence Avow meter to measure the stresses to verify the connections are on computer, with a speed of reading 200,000 thousand read per second or 200 kilometers

per second with an res pricy 16 pit any, divide the distance to 65 536 section can be obtained Accordingly, if the insert 10 volts can be divided into 65 536 part of the voltage this is a high accuracy it is also very occasion for measuring the instantaneous velocity of a punch .

The fourth element: program (lab view software 2011) form (4)



Depend programs used in form programming such as program (visual studio C + +, visual basic) and other programs on the programming language, which is a writing complicated sentences, but that this program depends on the draw thing desirable without writing This is a Advantages as well as the as characterized by interfaces easier to use than other programs, as the

company has produced produce Hard ware hard wear there Vicu consensus between the software and the hard wear and shape (4) graphic shows the planned program and of the equipment designed by the researcher.

The Fifth Element: (lists of wood) form (6)

Been using a number 2 column of wood along the 14:00 and display of 5.5 cm

and a thickness of 2.5 cm was also open course in each column length of 1.30 m were developed each column on a square base 40 cm x 40 cm and used these lists to carry sensors where all the existing situation

Setting in. 10 Sensors at distances of 5 cm and columns is placed on the side of a boxer when metering .

Sixth element: program interface form (5)

form (5)

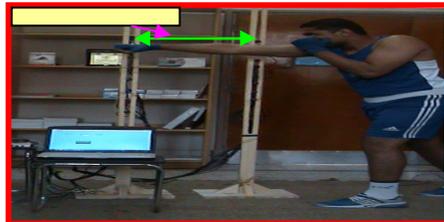
The user interface (software)



The modus operandi of the equipment: the form (6)

Program is open (lab view) located on the computer desktop and write distance confined between the first column and the second measured strictly in terms of speed is a change in the distance on the change that occurs in the time distance traveled, then stands boxer pause on guard that the equipment is designed on the side of the arm tested and which will be monitored and

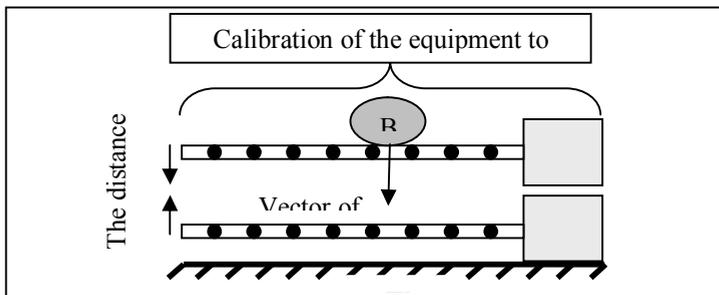
then is pushed new read, then give the signal for the boxer to the performance of the punch best of his speed appears to us the amount of instantaneous velocity and final punch immediate than enabling coach of providing nutrition reactionary that require it , as is the performance of three attempts and taking the average or trying to choose the best boxer form (6) shows that.



form (6)

Equipment to measure instantaneous velocity

Calibration the equipment designer

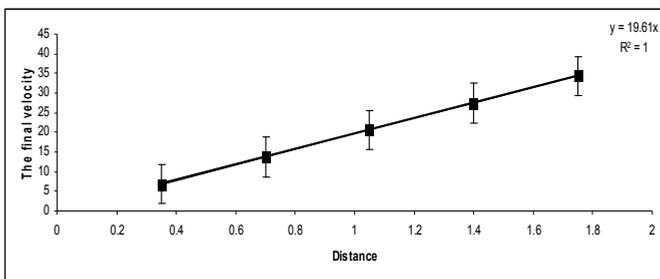


Evidenced by form (7) calibration used and based on one of the Physical equations to calculate final velocity of the fall of the ball placed directly above the sensor in the direction of gravity - The equation used to calculate the final speed of the calibration procedure

final velocity = initial velocity + 2 * g * distance between the columns

Table (1)
Scientific calibration to find the linear relationship
Between distance and final velocity

M	The distance between the two columns	Equation final velocity	Result final velocity
1	0.35 cm	$V_f = V_0 + 2 * g * d$	6.8 m
2	0.70 cm		13.7 m
3	1.05 m		20.6 m
4	1.4 m		27.46 m
5	1.75 m		34.33 m



Evidenced by table (1) Figure (8) enables the researcher by Equation final velocity of finding a linear

relationship between both the of the distance changing change is consistent and confined between the two

columns form (7) and the final velocity of the fall of timid theme over the sensor directly, which shows us the sincerity of the device designer the measure was designed for him

Present and discuss results :-

- First measure the instantaneous velocity in the light of the characteristics of the technically punch

Had been able to researcher through multiple applications and times different time measuring instantaneous velocity of a punch straight in the head, which gave satisfactory results in line with the characteristics technically the punch where it appears the form (8) the findings of a researcher from design geometrical to Again movement boxer during the performance of the punch where there are not any Telecommunications boxer being a test device designed as shown table (1.2) results to measure the instantaneous velocity of the different weight categories (Lightweight, average, above average, heavy, heavy above .

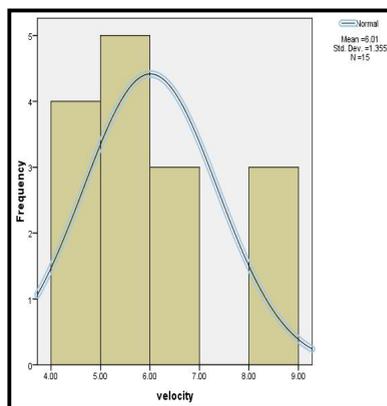
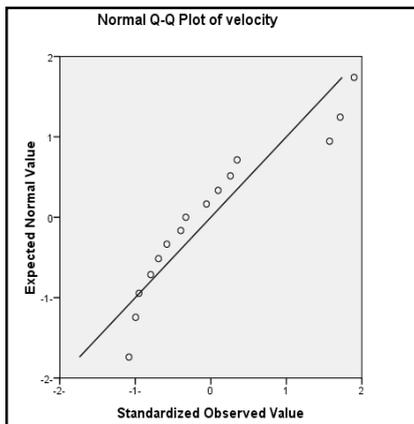
Secondly capture analog electrical signal wirelessly:

Could researcher to answer the second question by the findings of the the design has the ability to pick up the electrical signal wirelessly through the sensor user (sensors) and who is shoot down light on the body or arm observed and which is reflected again to the sensor and then the technique (data causation) converts this analog electrical signals received from the sensor to the numeric values which appear immediately on Face the program (lab view) to the PC .

- Third, the results of the values of instantaneous velocity of attempts to punch straight to the performance of the research sample :

After knowing the values of instantaneous velocity of a punch straight from the equipment designed by the researcher to the category weights of various research sample totaling 5 boxers, the researcher conducting the first treatment of statistical and descriptive in order to know that these values are subject to the normal distribution under the curve and does not have its dispersion and came as follows :

form (7)



Evidenced by the form of (7 , 8) the form of normal distribution of values and their proximity to the straight line shown in Figure where values ranged standard deviation of those values between (1.35), which indicates the

straightening the values ,which indicate the credibility of the system designer, which measures already put the futures and then can rely it tests measure the instantaneous velocity of a punch straight sport of boxing

Table (1)

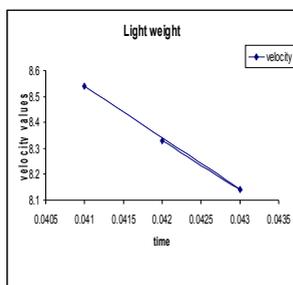
Statistical significance of differences of the values of instantaneous velocity of a punch straight in Three attempts for each per capita

nm	name	Category	Weight Kg	Average time (S)	Values of instantaneous velocity of a punch straight					
					The attempts			Average Speed (m/s)	Standard deviation	Cross tabulated .value T
					A	B	C			
1	Islam Muhammad	Light	56	0.042	8.33	8.14	8.54	8.33	0.221	0.096
2	Ahmed Hassan	Medium	69	0.055	6.48	6.36	6.14	6.33	0.172	0.041
3	Mohamed Tewfik	Above Medium	81	0.062	5.47	5.56	5.93	5.65	0.244	0.021
4	Mustafa Kamel	Heavy	91	0.069	4.93	5.07	5.22	4.74	0.154	0.077
5	Mohammed Abu Zaid	Above Heavy	115	0.075	4.66	4.54	4.72	4.46	0.092	0.025

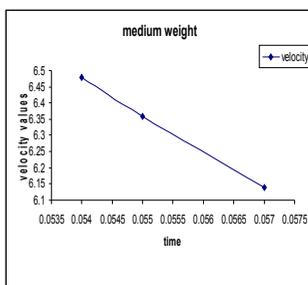
Evidenced by the Table 1 arithmetic mean and the standard deviation of the values of both the instantaneous velocity and the time of the punch straight in attempts three per capita ranged average standard

deviation of the weights of (0.092: 244) also that there is no statistically significant differences between the results of the trials of the three for each per capita separately in the amount of instantaneous velocity to punch straight .

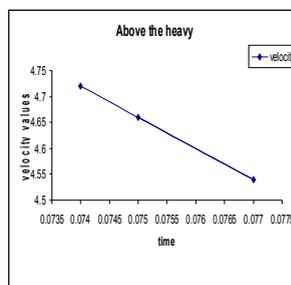
form (9)



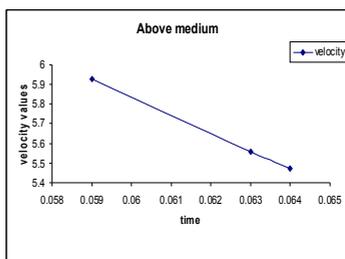
form (10)



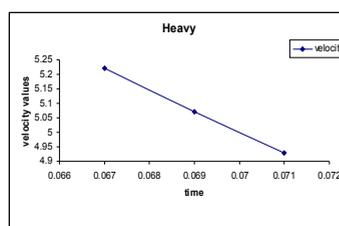
form (11)



form (13)



form (12)



Format shows (9,10, 11,12,13), the values of instantaneous velocity with time performance punch straight to the categories of different weights, which show a lack of statistical differences are clear between the individual and himself in attempts when the request of

the boxer's performance punch the best of his speed and that the del demonstrates the credibility of the equipment designed by the researcher.

- Fourth, the results of the values of instantaneous velocity of a punch straight between the different weight categories:

Table (2)

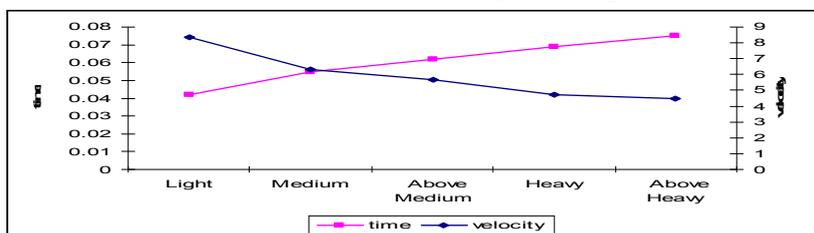
nm	name	Weight class	Weight Kg	Average time	Values of instantaneous velocity of a punch straight			
					Av instantaneous v of a class	Av between weight classes	St. dev	value .T.K2
1	Islam Muhammad	Light	56	0.042	5.902 M/S	8.33	1.54	1.73
2	Ahmed Hassan	Medium	69	0.055		6.33		
3	Mahmoud elRahman	Above Medium	81	0.062		5.65		
4	Mustafa Kamel	Heavy	91	0.069		4.74		
5	Mohammed Abu Zaid	Above Heavy	115	0.075		4.46		

Seen from the Table (2) the arithmetic mean and the standard deviation of the values of both the instantaneous velocity and the time of the punch straight between weight classes where the standard deviation between the groups (1.54) as there are statistically significant

differences between weight classes different in the amount of instantaneous velocity of a punch straight, which amounted to (1.73) and this demonstrates to us that the equipment has the ability to clarify the differences between the measured weight categories of cost

From (14)

Average Instantaneous velocity and time punch straight between the different weight categories



the curve shows Characteristics the speed and time format (14) the variance between the ages of different categories of weight training which confirms our credibility in the equipment to show the differences in the

measurement of instantaneous velocity, which, when tested those values statistically researcher gave statistically significant differences.

Conclusions of Search :

Search within the limits of objective and in the light of the questions and methodology used enables a researcher from the following :

-Through research procedures enables the researcher to design a equipment to monitor the amount of instantaneous velocity of a punch straight feature wireless transmission in accordance with the functional properties of the a punch straight.

- Researcher enables to pick up the electrical signal by sensors, which are used guarantee our does not happen on the Outdoor jamming the signal reflected from the body observed.

- Could equipment designed to provide satisfactory results with the time difference daily time

Recommendations of the research :

- Expansion of use of the equipment designer, which was built on the basis of scientific and engineering properly, which provides us with an assessment kinematical about the instantaneous velocity of the punch immediate and then can find out by force in terms of mass, which enables the coach to provide nutritional retro required where is the speed and power variables

kinematical important in evaluating the technical performance of the punch .

- Must procedure on the equipment current developments in the research of other advantages, including greater guarantees upgrading the technical performance of the players inside the boxing Arab Republic of Egypt.

The references of the research :

the Arabic references

1-Hossam Refqy Mahmoud "boxing between theory and practice," Egyptian Renaissance Library, Cairo, 1993.

2- Uday Gaspe Hassan, Essam El-Din Shaaban: evaluation methods and means of mechanical, magazine Qadisiyah Science Physical Education - ninth volume - Third Issue, 2009 .

- the English references

3- Carlin J. A., (1986) Reaction Time and Force Feedback System. United States Patent. 4763284. August 9, 1988 .

4 -Ralph Robin Cacacho, Frederick Oyas, John Paul Priolo, Geuel Yasis, Winston Dereje Punching Bag With Speed and Accuracy Gauge College of Engineering, Don Bosco Technical College, Mandaluyong, Philippines .