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Data Science to design sports attire for better individual performance

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ABSTRACT

A player's performance depends on a lot of factors. His personality, environment, playing style, teammates. Is luck one of those factors? Managers and Club Directors cannot change a player's personality, no matter how much they throw money for it. What they can do is provide Sporting Attires, Playing Positions, and Training Equipment that the players want. Now in a world where Social Media is ruling, every player wants to look good while also playing well, to take their own personal brands forward. So can there be a way where Clubs can analyze the Sentiments of each player in their squad according to the different styles of Jerseys that they play in? This paper gives a solution where we analyze the Sentiments of Players and their Performances in a particular style or design of Jersey, and give jerseys perfect for the whole squad to perform better.

Keywords: *Sports, Sentiment, Data Analysis, Machine Learning, Jersey, Design, Computer Engineering*

PROBLEM DEFINITION

A players performance depends on a lot of factors. His personality, environment, playing style, teammates. Mangers and Club Directors cannot change a players personality, no matter how much they throw money for it. What they can do is provide Sporting Attires, Playing Positions and Training Equipment that the players want.

Now in a world where Social Media is ruling, every players wants to look good while also playing well, to take their own personal brands forward. So can there be a way where Clubs can analyze the Sentiments of each player in their squad according to different styles of Jerseys that they play in?

For example, Messi plays well for Barcelona which has a dark striped jersey, but not for Argentina, which is a light coloured jersey. Now many people could argue Argentina does not have the players around Messi to win matches, but so does Barcelona. So why does the Barca jersey inspire Messi more to push his limits and change games on his own, but cannot do the same for Argentina?

RESEARCH ON WHAT ALREADY EXISTS

Data has become the main tool for Decision Making in the modern world. Today Data is used in Businesses, Schools, Universities, Governments to make big decisions for themselves and others. Recently, it has taken over the Sports Industry as well. Data Analytics has always been used by Teams to make strategies against each other or by Pundits and Journalists to give their expert opinion on a match.

If we look at more recent times, Data Analytics has been used for various purposes by sports Clubs. They are used for things like Improving Back-Office Intelligence, Expanding Partnerships, Scouting Players, etc. At the MIT Sloan Sports Analytics Conference, for example, Evan Wasch, senior vice president of basketball strategy and analytics for the NBA, described an intricate web of decision points that affect the quality of the product, ranging from scheduling and playoff structure to draft lotteries. Data can prompt small changes that make a big difference, he asserted.

Now as we mentioned before, the Club Directors and Mangers can only provide Training Equipments, Playing Positions and Strategies to get the best out of his players. So we will be focusing on how Sports Attire Designs can be used as a tool for Better Performances from Sportsmen.

PROPOSED SOLUTION & PROOF OF CONCEPT

PROPOSED SOLUTION :

Develop a Sentiment Analyzer whose results will be taken as input by a Machine Learning and based on those, will provide Jersey Designs based on the following Parameters:

- ✧ Colour
- ✧ Jersey Style (Stripes, Solid)
- ✧ Secondary Colour
- ✧ Sleeve Length

Step 1: SENTIMENT ANALYZER

The first step we need to is to make a Sentiment Analyzer which will detect the Sentiments of a player in different situations. To do that we need to input statistics of a player seasonwise, like goals, assists, distance covered, and also input Sentiments of the player sentiments. This will act as a Sample Dataset for the Machine to learn similarities between Sentiments and the attributes we gave to the machine.

Sentiment Analyzer can be made using a Support Vector Machine, to create the best line or decision boundary that can segregate n-dimensional space into classes so that we can easily put the new data point in the correct category in the future.
Algorithm for the Sentiment Analyzer:

S = Performance (Energy + Location)

Location = [Performance in Away Games] - 0.5*[Performance in Home Games]

Performance would matter on the Position that each sportser plays in.

For Example:

A Forward can have a Performance Matrix of [No.of Goals] + 0.5*[No.of Assists]

whereas for Midfielders, 0.5*[No.of Goals] + [No.of Assists].

These parameters can also change according to the positions among a particular Region. Like a Winger would be expected to have more assists whereas Strikers would have a lot more goals although they are both considered Forwards.

Whatever be the Algorithm score should be multiplied with a variable called Weightage (W), since if we take Career stats of a player, there is high probability that the player did not have equal importance in the team, which generally is low when a player commences his career, and then it rises and falls down once his career comes to an end. The weightage score would be scored out of 0 10 1.

As the final score is calculated we divide our SVM into categories Bad, Average, Good and Great according to scores which would be calculated out of a scale of 100, and segregate the players according to their Sentiment Score,based on each season, so that the change in Sentiment is visible with each small change in the jersey. Then we input these Final Sentiment scores into our Machine Learning model.

Step 2: CLASSIFICATION MODEL

We input Sample Numbers of the Output Parameters which are Colour, Style, Secondary Colour, Sleeve Length. The Sample Numbers should ideally be Season wise Statistics of recently retired sportsers, so that the Model learns to identify the difference in Player Performance with Change in Jersey Design, even if they are minute.

We also the Input the Sentiment Scores of these players and let the Model learn by matching the Input and Output datasets, and let the Machine learn about the relations between Sentiment and Jersey Styles.

The model will finally get trained after thousands of such Sample Datasets are passed through it. Once the model gets trained, it will learn to give the outputs i.e Jersey Colour, Style, Secondary Colour and Sleeve Length from the Final Sentiment Scores that is calculated by the SVM Model that we trained earlier.

So, the Output would come in a format which would look like numericals, which will needed to be passed through Data Screening, for the output to be seen in actual words.

Sample Output:
Colour: #FRS634
Style: 0. 44 \\ 1.00 = Stripes, 0.00 = Solid
Secondary Colour: #RDF435
Sleeves: 0.62 \\ 0.51 to 1.00 = Full Sleeve, 0.00 - 0.50 = Half Sleeve

Step 3: FINAL OUTPUT
Team Jersey:

- ✧ Average Color (Hex)

- ✧ Avg. Style (Decimal)
- ✧ Avg. Secondary Color (Hex)
- ✧ Avg. Sleeve Length (Decimal)

Table 1. SVM Model (Training Data)

Player	Performance	Mood	Location	S	Weightage	FSS	Remark
Ronaldo	4.5	9	6	6.75	10	67.5	Great
Ronaldo	5.5	10	10	11	10	110	Great
Ronaldo	5	10	7	4.25	10	42.5	Average
Ronaldo	5	9	10	9.5	9	85.5	Great
Ronaldo	4	9	9	7.2	9	64.8	Great
Ronaldo	4	10	7	6.8	8	54.4	Great

Table 2. ML Model (Training Data)

Player	FSS	Jersey Color	Secondary Colour	Sleeve Length	Style
Ronaldo	67.5	#RDB435	#000000	0.75	0.76
Ronaldo	110	#FGE637	#DVF647	0.67	0.54
Ronaldo	42.5	#FDH582	#FRE648	0.89	0.23
Ronaldo	85.5	#SCT243	#VGR854	0.78	0.34
Ronaldo	64.8	#BFY867	#DBT798	0.67	0.69
Ronaldo	54.4	#GOW632	#VHW906	0.87	0.51

Table 3. Output Model

PLAYERS	Final Sentiment Score (FSS)	Remark	Jersey Colour	Secondary Color	Sleeve Length	Style
Ronaldo	67.5	Great	#RDB435	#000000	0.75	0.76
Messi	66	Great	#GFE657	#RFB675	0.23	0.89
Lampard	45.5	Good	#HFT327	#QWE564	0.34	0.15
Gerrard	35	Bad	#ASV375	#NPR756	0.65	0.41
Robben	49.5	Good	#RTM657	#TDE978	0.22	0.67
Ribery	49	Good	#000000	#DEQ657	0.45	0.12
Pepe	43	Average	#RTT543	#NGU649	0.23	0.43
Puyol	35	Bad	#BBB499	#NFH484	0.43	0.23
Scholes	51.5	Great	#DBZ811	#GRB628	0.79	0.44
	(#Testing Data)					
Hazard	46	Good	(PREDICTED BY ML MODEL)			
Neymar	39	Average				
TEAM JERSEY	(Will Calculate the Jersey design after taking the predicting the Jersey design of all players in Squad)					

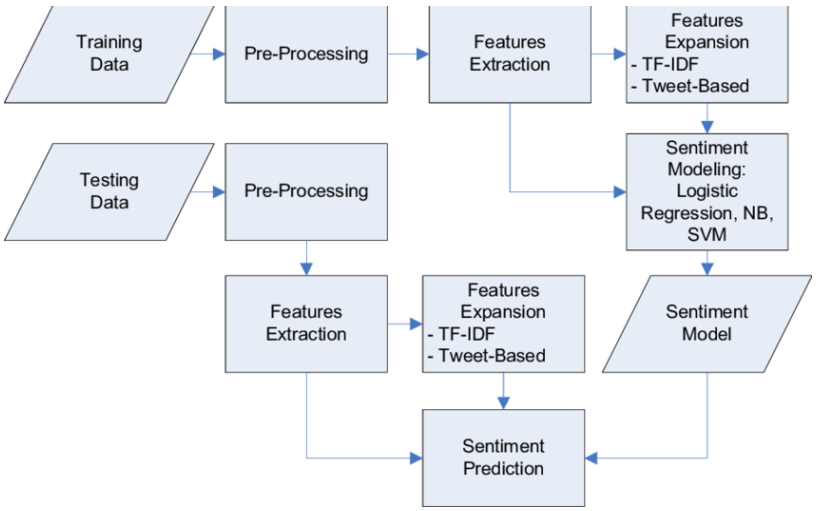

Fig 1: Sentiment Analysis Workflow

Fig 2: Machine Learning Workflow

NOVELTY

In a generation where Social media rules, the way one looks impacts ones confidence greatly. This paper has used that that aspect of a sportsmen to develop a Machine Learning model to enhance his/her performance.

- ✧ The research paper showed how a common jersey design can be made taking every players preferred colour.
- ✧ This may not impact in changing Home Jerseys of sports Clubs as their jersey colours are linked with their long histories with which the fans associate themselves with to a great extent.
- ✧ But this model can be used to Design Away Jerseys or even small changes in the Home Jerseys. The model can be used as a means to scout players, as it would be able to predict a players ability to adapt to a Club's atmosphere and its fans.
- ✧ This model would also give the Sentiment Scores of each player, by which we can acquire personal designs for each player. So by using their personal predictions, we can design their socks, boots, and other sporting equipments.

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