Analysis of Afl Results For Years 2016 And 2017 Using Elo Models

Keerthi Prasad K, NithyaPreetha, Gokul Prasad K, P.S.Rajeswari

Abstract: The research consists of the score data analysis for the years 2016 and 2017. The research reveals interesting analysis of ELO models based ratings and their consistency. ELO ratings only focus on team-level outcomes and not on individual players. AFL and its sister sites for generating ELO ratings for individual players. However, it may be possible to use various ELO models show facts on accuracy between different models based on the comparison between the models.

Key Words: ELO models, Optimize, Exploration, Comparison

I. INTRODUCTION

AFL (Australian Football League) is a fast, free-flowing game that is the most popular sport in Australia. The game looks to be hybrid of rugby and soccer with a bit of basketball thrown in for good measure. The game is played on an oval ground that is about twice as long and wide as an American football field. There are 18 players on each side. The objective is to kick the ball between the two middle polls at each end. A goal is worth scored if the ball is kicked through the middle posts and is worth 6 points. If the goal is kicked between the middle post and the smaller side post or if the ball goes between the middle posts without being kicked, then 1 point is scored. There is no offside, so players can move anywhere on the field and can pass the ball in any direction. The Australian Football League (AFL) is the pre-eminent professional competition in the sport of Australian football in Australia and features only Australian teams. The league currently consists of 18 teams spread over five of Australia's five states. Our objective as part of this report is to analysis the performance of the teams from the year 2016 and 2017. There are variations of Massey constant models by improvising fixed and standard ELO models to come up with the ratings for each team during these years. Improvising the models by changing the home advantage and the k values, does lead to comparison of the accuracy between various models. The dataset used contains results data for the seasons 2016 and 2017, including team names, match scores and match location (home/away).

Revised Manuscript Received on June 8, 2019

Er. Keerthi Prasad. K, Research Scholar, RMIT, Australia
Dr.NithyaPreetha P, Assistant, Professor, Faculty of Management, SRM Institute of Science and Technology,Kattankulathur,TamilNadu,India
Gokul Prasad.K,Research Scholar,VIT
Dr.P.S.Rajeswari, Assistant Professor, Faculty of Management, SRM Institute of Science andTechnology,Kattankulathur,TamilNadu,India,603203
.

II. PROCEDURE FOR PAPER SUBMISSION

A. Review Stage

Submit your manuscript electronically for review.

B. Final Stage

When you submit your final version, after your paper has been accepted, prepare it in two-column format, including figures and tables.

C. Figures

As said, to insert images in *Word*, position the cursor at the insertion point and either use Insert | Picture | From File or copy the image to the Windows clipboard and then Edit | Paste Special | Picture (with "Float over text" unchecked).

The authors of the accepted manuscripts will be given a copyright form and the form should accompany your final submission.

III. MATH

If you are using *Word*, use either the Microsoft Equation Editor or the *MathType* add-on (http://www.mathtype.com) for equations in your paper (Insert | Object | Create New | Microsoft Equation *or* MathType Equation). "Float over text" should *not* be selected.

IV. UNITS

Use either SI (MKS) or CGS as primary units. (SI units are strongly encouraged.) English units may be used as secondary units (in parentheses). **This applies to papers in data storage.** For example, write "15 Gb/cm^2 (100 Gb/in^2)." An exception is when English units are used as identifiers in trade, such as "3½ in disk drive." Avoid combining SI and CGS units, such as current in amperes and magnetic field in oersteds. This often leads to confusion because equations do not balance dimensionally. If you must use mixed units, clearly state the units for each quantity in an equation.

The SI unit for magnetic field strength H is A/m. However, if you wish to use units of T, either refer to magnetic flux density B or magnetic field strength symbolized as $\mu_0 H$. Use the center dot to separate compound units, e.g., "A·m^2."

V. HELPFUL HINTS

A. Figures and Tables

Because the final formatting of your paper is limited in scale, you need to position figures and tables at the top and bottom of each column.

Large figures and tables may span both columns. Place figure captions below the figures; place table titles above the tables. If your figure has two parts, include the labels "(a)" and "(b)" as part of the artwork. Please verify that the figures and tables you mention in the text actually exist. **Do not put borders around the outside of your figures.** Use the abbreviation "Fig." even at the beginning of a sentence. Do not abbreviate "Table." Tables are numbered with Roman numerals. Include a note with your final paper indicating that you request color printing.

Do not use color unless it is necessary for the proper interpretation of your figures. There is an additional charge for color printing.

Figure axis labels are often a source of confusion. Use words rather than symbols. As an example, write the quantity "Magnetization," or "Magnetization *M*," not just "*M*." Put units in parentheses. Do not label axes only with units. As in Fig. 1, for example, write "Magnetization (A/m)" or "Magnetization ($A \cdot m^{-1}$)," not just "A/m." Do not label axes with a ratio of quantities and units. For example, write "Temperature (K)," not "Temperature/K."

Multipliers can be especially confusing. Write "Magnetization (kA/m)" or "Magnetization (10^3 A/m)." Do not write "Magnetization (A/m) × 1000" because the reader would not know whether the top axis label in Fig. 1 meant 16000 A/m or 0.016 A/m. Figure labels should be legible, approximately 8 to 12 point type.

B. References

Number citations consecutively in square brackets [1]. The sentence punctuation follows the brackets [2]. Multiple references [2], [3] are each numbered with separate brackets [1]–[3]. When citing a section in a book, please give the relevant page numbers [2]. In sentences, refer simply to the reference number, as in [3]. Do not use "Ref. [3]" or "reference [3]" except at the beginning of a sentence: "Reference [3] shows ... ." Number footnotes separately in superscripts (Insert | Footnote).[1] Place the actual footnote at the bottom of the column in which it is cited; do not put footnotes in the reference list (endnotes). Use letters for table footnotes (see Table I).

Please note that the references at the end of this document are in the preferred referencing style. Give all authors' names; do not use "*et al*." unless there are six authors or more. Use a space after authors' initials. Papers that have not been published should be cited as "unpublished" [4]. Papers that have been submitted for publication should be cited as "submitted for publication" [5]. Papers that have been accepted for publication, but not yet specified for an issue should be cited as "to be published" [6]. Please give affiliations and addresses for private communications [7].

Capitalize only the first word in a paper title, except for proper nouns and element symbols. For papers published in translation journals, please give the English citation first, followed by the original foreign-language citation [8].

[1]It is recommended that footnotes be avoided (except for the unnumbered footnote with the receipt date on the first page). Instead, try to integrate the footnote information into the text.

C. Abbreviations and Acronyms

Define abbreviations and acronyms the first time they are used in the text, even after they have already been defined in the abstract. Abbreviations such as SI, ac, and dc do not have to be defined. Abbreviations that incorporate periods should not have spaces: write "C.N.R.S.," not "C. N. R. S." Do not use abbreviations in the title unless they are unavoidable (for example, "INTERNATIONAL JOURNAL OF COMPUTER THEORY AND ENGINEERING" in the title of this article).

D. Equations

Number equations consecutively with equation numbers in parentheses flush with the right margin, as in (1). First use the equation editor to create the equation. Then select the "Equation" markup style. Press the tab key and write the equation number in parentheses. To make your equations more compact, you may use the solidus (/), the exp function, or appropriate exponents. Use parentheses to avoid ambiguities in denominators. Punctuate equations when they are part of a sentence, as in

$$\int_0^{r_2} F(r,\varphi)\, dr\, d\varphi = [\sigma r_2 / (2\mu_0)] \cdot \int_0^{\infty} \exp(-\lambda\,|\,z_j - z_i\,|)\,\lambda^{-1}\, J_1(\lambda r_2)\, J_0(\lambda r_i)\, d\lambda\,. \tag{1}$$

Be sure that the symbols in your equation have been defined before the equation appears or immediately following. Italicize symbols (*T* might refer to temperature, but T is the unit tesla). Refer to "(1)," not "Eq. (1)" or "equation (1)," except at the beginning of a sentence: "Equation (1) is ... ."

E. Other Recommendations

Use one space after periods and colons. Hyphenate complex modifiers: "zero-field-cooled magnetization." Avoid dangling participles, such as, "Using (1), the potential was calculated." [It is not clear who or what used (1).] Write instead, "The potential was calculated by using (1)," or "Using (1), we calculated the potential."

Use a zero before decimal points: "0.25," not ".25." Use "cm^3," not "cc." Indicate sample dimensions as "0.1 cm × 0.2 cm," not "0.1 × 0.2 cm^2." The abbreviation for "seconds" is "s," not "sec." Do not mix complete spellings and abbreviations of units: use "Wb/m^2" or "webers per square meter," not "webers/m^2." When expressing a range of values, write "7 to 9" or "7-9," not "7~9."

A parenthetical statement at the end of a sentence is punctuated outside of the closing parenthesis (like this). (A parenthetical sentence is punctuated within the parentheses.) In American English, periods and commas are within quotation marks, like "this period." Other punctuation is "outside"! Avoid contractions; for example, write "do not" instead of "don't." The serial comma is preferred: "A, B, and C" instead of "A, B and C."

If you wish, you may write in the first person singular or plural and use the active voice ("I observed that ..." or "We observed that ..." instead of "It was observed that ..."). Remember to check spelling.

If your native language is not English, please get a native English-speaking colleague to proofread your paper.

VI. SOME COMMON MISTAKES

The word "data" is plural, not singular. The subscript for the permeability of vacuum μ_0 is zero, not a lowercase letter "o." The term for residual magnetization is "permanence";

the adjective is "remanent"; do not write "remnance" or "remnant." Use the word "micrometer" instead of "micron." A graph within a graph is an "inset," not an "insert." The word "alternatively" is preferred to the word "alternately" (unless you really mean something that alternates). Use the word "whereas" instead of "while" (unless you are referring to simultaneous events). Do not use the word "essentially" to mean "approximately" or "effectively." Do not use the word "issue" as a euphemism for "problem." When compositions are not specified, separate chemical symbols by en-dashes; for example, "NiMn" indicates the intermetallic compound $Ni_{0.5}Mn_{0.5}$ whereas "Ni–Mn" indicates an alloy of some composition Ni_xMn_{1-x}.

Be aware of the different meanings of the homophones "affect" (usually a verb) and "effect" (usually a noun), "complement" and "compliment," "discreet" and "discrete," "principal" (e.g., "principal investigator") and "principle" (e.g., "principle of measurement"). Do not confuse "imply" and "infer."

Prefixes such as "non," "sub," "micro," "multi," and ""ultra" are not independent words; they should be joined to the words they modify, usually without a hyphen. There is no period after the "et" in the Latin abbreviation "*et al.*" (it is also italicized). The abbreviation "i.e.," means "that is," and the abbreviation "e.g.," means "for example" (these abbreviations are not italicized).

An excellent style manual and source of information for science writers is [9].

VII. STATEMENT OF PROBLEM

This research is multi-fold with the given data and the requirements. The aim is to build several ELO models, which include a home advantage parameter H which is constant, when it applies, across all teams and rounds. The idea is to build a "Fixed ELO" model on the 2016 data. "Fixed ELO" is an ELO version of the Massey model in which each team has a rating which is held constant across the whole season. The match predictions are probabilities calculated in the usual ELO fashion. The ELO ratings and the home advantage (parameter H) are optimized to fit the observed results in the usual way. And then build a standard "Variable ELO" model on the 2016 and 2017 data. The model should give each team a constant initial rating of 1500. We then optimize the model parameters (i.e. H and K) to give the best fit to the 2016 data. The objective from this would be to obtain the details of this model to find H and K and quote the accuracy of % correct from round 2 onwards. It is finally aimed to build a realistic forecasting ELO model for 2017 by using H and K from 2016 "Variable ELO" model, and use the "Fixed ELO" ratings from as the initial ratings for the 2017 season by not using any parameters optimized on 2017. We intend to determine the accuracy of % correct including round 1 and infer the comparison with the fixed and standard variable ELO models. We would then try to improve the model by adjusting the K value so that it varies depending on the score margin without using the optimization on 2017 in any way. We will apply the changes to the 2016 model in order to re-optimize the 2016 parameters and then infer the findings on the accuracy of % correct. And finally to observe and interpret the differences in the accuracy of the models used.

VIII. METHODS

The ELO rating system is a method for calculating the relative skill levels of teams or players in zero sum games. The ELO system was originally invented as an improved chess rating system over the previously used harkness system, but is also used as a rating system for multiplayer competition in a number of video games, association football, American football, basketball, Major League Baseball, Scrabble, board games such as Diplomacy and other games. The difference in the ratings between two teams serves as a predictor of the outcome of a match. Two teams with equal ratings who play against each other are expected to score an equal number of wins. The team whose rating is 100 points greater than their opponent's is expected to score 64% and if the difference is 200 points, then the expected score for the stronger team is 76%.A team's ELO rating is represented by a number which increases or decreases depending on the outcome of games between rated players. After every game, the winning team takes points from the losing one. The difference between the ratings of the winner and loser determines the total number of points gained or lost after a game. In a series of games between high-rated teams and low-rated teams, the high-rated team is expected to score more wins. If the high-rated team wins, then only a few rating points will be taken from the low-rated team. However, if the lower rated team scores an upset win, many rating points will be transferred. The lower rated team will also gain a few points from the higher rated team in the event of a draw. This means that this rating system is self-correcting. A team whose rating is too low should, in the long run, do better than the rating system predicts, and thus gain rating points until the rating reflects their true playing strength.

Building a fixed ELO model

Fixed ELO model is constructed by having ratings of the teams fixed to 1500 and also by trying the model with a home advantage, H value as 10. The ratings for teams A & B are calculated with the fixed team ratings as 1500 and the ratings based on the home advantage is calculated. Then, the solver function is used to minimize the value of the sum of squared difference by having the sum of the ratings fixed.

Building a standard "variable" ELO model

Standard Variable ELO model is constructed by having ratings of the teams fixed to 1500 to start with and by trying the model with a home advantage, H value as 10 and in addition to that the K value. The ratings for teams A & B are calculated with the fixed team ratings as 1500 and the ratings based on the home advantage is calculated.

Adjusted ratings A is calculated based on the initiated K value of 10. Then, the solver function is used to minimize the value of the sum of squared difference by changing the variable of K and H value.

IX. RESULTS

Table:1 Fixed ELO model for 2016-Optimized **Team Ratings [1]**

[2] Adelaide	[3] 1760.9
[4] Brisbane Lions	[5] 1095.7
[6] Carlton	[7] 1224.3
[8] Collingwood	[9] 1284.2
[10] Essendon	[11] 1019.2
[12] Fremantle	[13] 1050.2
[14] Geelong	[15] 1941.0
[16] Gold Coast	[17] 1175.4
[18] Greater Western Sydney	[19] 1832.4
[20] Hawthorn	[21] 1837.0
[22] Melbourne	[23] 1447.8
[24] North Melbourne	[25] 1621.4
[26] Port Adelaide	[27] 1476.5
[28] Richmond	[29] 1315.9
[30] St Kilda	[31] 1513.8
[32] Sydney	[33] 1850.1
[34] West Coast	[35] 1802.6
[36] Western Bulldogs	[37] 1751.5

Table2: Home Advantage Value

H	120.81				
Match		Team A	Team B	Location	Game
1	2016	Carlton	Richmon	MCG	
1	2016	Richmond	Carlton	MCG	
2	2016	Greater Western	Melbourne	MCG	
2	2016	Melbourne	Greater Western	MCG	
3	2016	Essendon	Gold coast	Metricon	
3	2016	Gold Coast	Essendon	Metricon	
4	2016	Collingwood	Sydney	SCG	

Optimized team ratings are depicted on the left side and the home advantage value is shown in the above table. The optimized home advantage value is 120.81

Success rate across the season

Success rate is the average of the correct column. Values of correct column is calculated based on the product of actual and expected margin after subtracting 0.5, being greater than zero to be 1 and if this product is not greater than zero, then this would be zero and in turn will not make a difference in the average value calculated for the success rate to be determined. Percentage success rate is 83%.

Table 3: Success Rate

[38]	[39]	[40]	[41]	**[42] Sum of squared Diff. =>**	**[43]**	**[44] 54.57**	**[45] 0.83 [46] <= Accuracy %**
[47] Rating	**[48] RA+HA**	**[49] RA+HB**	**[50] Actual Margin**	**[51] Expected Margin**	**[52] Signed Margin**	**[53] Squared Diff**	**[54] Correction**
[55] 1315.87	[56] 1224.33	[57] 1315.873	[58] 0	[59] 0.371225067	[60] -0.37123	[61] 0.13780805	[62] 1
[63] 1224.33	[64] 1315.873	[65] 1224.33	[66] 1	[67] 0.628774933	[68] 0.371225	[69] 0.13780805	[70] 1
[71] 1447.81	[72] 1832.387	[73] 1568.619	[74] 0	[75] 0.820297417	[76] -0.8203	[77] 0.672889492	[78] 0
[79] 1832.39	[80] 1568.619	[81] 1832.387	[82] 1	[83] 0.179701583	[84] 0.820298	[85] 0.672889492	[86] 0
[87] 1175.44	[88] 1019.217	[89] 1296.252	[90] 0	[91] 0.168717953	[92] -0.16872	[93] 0.028465748	[94] 1
[95] 1019.22	[96] 1296.252	[97] 1019.217	[98] 1	[99] 0.831282047	[100]0.168718	[101]0.028465748	[102]1
[103]1850.06	[104]1284.178	[105]1970.869	[106]0	[107]0.018837003	[108]-0.01884	[109]0.000354833	[110]1

Standard variable ELO model for 2016

Unlike the fixed model, H value and K value is considered for the Standard Variable ELO model and this is initiated with value of 10 for H and K. The model is constructed by having ratings of the teams fixed to 1500 to start with and by trying the model with a home advantage, H value and the K value. The ratings for teams A & B are calculated with the fixed team ratings as 1500 and the ratings based on the home advantage is calculated. Adjusted ratings A is calculated based on the initiated K value of 10. Based on the solver function the value of the sum of squared difference is minimized by changing the variable of K and H value.

Table 4: *Standard variable ELO model for 2016*

[111]K Value [112]K 75.41 [113]Match / [114]Yea	[120]H Value [121]H 83.55 [122]Team A / [123]Team B [124]Carlton / [125]Richmond [126]Richmo / [127]Carlton	[129]% Correction from Round 1	[130]% Correction from Round 2

Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication

	r	nd		[131]Sum of Squared Di.=> 76.54 Accuracy			0.68<= [145]0.67<= correct from round 3
[115]1	[116]2016	[128]		[132]Adj.Rating A	[133]Signed Diff	[134]Squared Diff	[135]Correct
[117]1	[118]2016			[136]1462.295137	[137]-0.5	[138]0.25	[139]0
[119]				[140]1537.704863	[141]0.5	[142]0.25	[143]0
				[144]			
				[146]% Correction from Round 1 is 68%			[147]% Correct from Round 2

Standard variable ELO model for 2017

Based on the 2017 input data, the values of H value and K value is considered for the Standard Variable ELO, unlike the fixed model. The H value and K value is started with 10 and then the model is constructed by having constant initial rating of 1500. The ratings for teams A & B are calculated with the fixed team ratings as 1500 and the ratings based on the home advantage is calculated. Adjusted ratings A is calculated based on the initiated K value of 10. Based on the solver function the value of the sum of squared difference is minimized by changing the variable of K and H value.

Table 5: *Standard variable ELO model for 2017*

(1) % Accuracy from Round 2

[148]K Value 37.74		[149]H Value 70.93		[150]% Correction from Round 1			[151]% Correction from Round 2
[152]Match	[153]Year	[159]Team A	[160]Team B	[166]Sum of Squared Diff.=> 89.90 0.59			[180]0.61 <= correct from Round 2
[154]1	[155]2017	[161]Carlton	[162]Richmond	[167]Adj.Rating A	[168]Signed Diff	[169]Squared Diff	[170]Correct
[156]1	[157]2017	[163]Richmond	[164]Carlton	[171]1480.628873	[172]-0.5	[173]0.25	[174]0
[158]		[165]		[175]1519.371127	[176]0.5	[177]0.25	[178]0
				[179]			
				[181]% Correct from Round 1 is 59%			[182]% Correct from Round 2 is 61%

(2) Table 6:Difference in Parameters between 2016 and 2017

[183] Parameter	[184] 2016	[185] 2017
[186] K Value	[187] 75.40973	[188] 38.74225
[189] H Value	[190] 83.54567	[191] 70.92772
[192] Sum of Squared diff.=>	[193] 76.53874	[194] 89.90469

- Significant difference in K value and minor difference in the Home advantage is noted.
- % Correctness of Round 1 and round 2 for 2016 has been more accurate with the % correct of 67% in both cases.

[202] % Correct for 2017 has been lower with 59% when calculated from Round 1 and 61% when

Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication

[195] % correct from Round 1	[196] 0.67676 8	[197] 0.59090 9	calculated
[198] % correct from Round 2	[199] 0.67195 8	[200] 0.61375 7	

[201]

Changed H and K value of 2016 for 2017

The optimized H value and K value of 2016 is being tried on 2017 data. Below are the results that were obtained. And it appears that is it almost the same with not much difference between the % correctness for the optimized value of 2017 and optimized values of 2016.

Table 7: *Changed H and K value of 2016 for 2017*

[203] K Value	**[204] H Value**	**[205] % Correct from Round 1**	**[206] % Correct from Round 2**
[207] [208] [209] 75.41 [210] [211] 2016 [212] [213] 2016 [214] [215]	[216] [217] H [218] 3.55 [219] Team A [220] eam B [221] Carlton [222] ichmond [223] Richmond [224] arlton [225]	[226] Sum f Squared Diff.=> [227] 91.42 [228] .59 [229] = Accuracy [230] 1462.3 [231] -0.5 [232] .25 [233] [234] 1537.7 [235] 0.5 [236] .25 [237] [238] [242] % Correct from Round 1 is 59%, which is same as the previous value when the K value and H value was optimized with the 2017 data	[239] = [240] Accuracy [241] 0.61<= correct from round 2 [243] % Correct from Round 2 is 61%, which is same as the previous value when the K value and H value was optimized on 2017

Realistic forecasting ELO

A realistic forecasting ELO model for 2017 is constructed with H and K from part 2016 "Variable ELO" model, and using the "Fixed ELO" ratings from 2016 data as the initial ratings for the 2017 season. This model does not use any parameters optimized on 2017.

(3) *Parameters in the forecasting model.*

Table 8: *Realistic forecasting ELO*

[244] K value and H value	**[245] % Correct from Round 1**	**[246] % Correct from Round 2**

[247] K	[248] 75.41	[249] H	[250] 83.55
[251] Match	[252]	[253] Team A	[254] Team B
[255] 1	[256] 2017	[257] Carlton	[258] Richmond
[259] 1	[260] 2017	[261] Richmond	[262] Carlton

[263]

[264] 0.63131	[265] <= Accuracy
[266] Correct	
[267] 1	

[268]

[269] 0.6292 <= Correct from Round R2

(4) Table 9:Difference between Previous models and Forecasting model

'0] Parameter	'1] 2016	'2] 2017	'3] 2017 Forecasting Model
'4] K Value	'5] 75.41	'6] 38.74	'7] 75.41
'8] H Value	'9] 83.55	30] 70.93	31] 83.55
32] % Correct from Round 1	33] 0.68	34] 0.59	35] 0.63
36] % Correct from Round 2	37] 0.67	38] 0.61	39] 0.63

[290]

- There is a difference in the K and H value noted
- There is an increase in the correctness % in the forecasting model compared to the other models. There is an accuracy of 63%, compared to 59% that was determined before applying the realistic forecasting model.
- And the % Correct from Round 2 is 63% in the forecasting model compared to 61% in the previous model.

ELO model optimization

The model was tried to be improved and optimized having applied the changes to the 2016 data and re-optimized the 2016 parameters using the F/F+A technique. K and H values are as below.

(1) Table 10: Difference between Previous models and Forecasting model

[291] K	[292] 87.27	[293] H	[294] 25.88

And the % correct is as shown below

[295] 0.631313	[296] <= Accuracy	[297] 0.629213	[298] <=Correct from Round 2

This does not show any improvement based on the below table. The % correct data was 71% from Round 1 and about 70% from round 2. This does show some amount of improvement from the previous model.

Comparison on Accuracy

Based on the construction of all the above models, with the comparison of the % correct from the computation, it turned out that Fixed ELO model was the most correct with 83% accuracy.

Table 11: Comparison on Accuracy

[299] Model	*[300] Correct*	*[301] %*
[302] 2016 Fixed	*[303] 0.83*	*[304] 83%*
[305] 2016 Standard	*[306] 0.68*	*[307] 68%*
[308] 2017 Standard	*[309] 0.59*	*[310] 59%*
[311] 2017 Realistic Forecasting	*[312] 0.63*	*[313] 63%*
[314] 2017 Optimized Model	*[315] 0.63*	*[316] 63%*

X. Conclusion

From the given score data of the 18 AFL playing teams, it was required to build several working ELO to come up with the structured report and understanding of the performance of the teams and interpretation various results from Fixed, Standard variable, realistic forecasting and optimized ELO model analysis. Primarily, it was noted that the home advantage does have impact on the well performing teams. Then the teams' ratings were calculated based on the standard rating value of 1500 to initiate our analysis and calculation to find the actual ratings. Then K values

were introduced for the standard ELO model and solver function was used to minimize the squared difference with a fixed rating for fixed model and just changing variables of K and H value for the standard variable ELO model. The values of K and H from optimized on 2016 data was used on 2017 to construct a forecasting model on 2017. Correctness of all the models were calculated based on the condition of determining if the difference on the products was greater than zero or not, which was then average to get the correctness average to come up with the accuracy percentage of the model. The model was then optimized to attempt an improvised version of the ELO model with usage of optimized value used on 2016 to be used on 2017 and then trying that by F/F+A technique to improvise it. Finally a comparison was made between the percentage accuracy from all the models. It appears that Fixed ELO model with 83% accuracy turned out as the most accurate model with the highest correctness average value out of all the models constructed with the given data. The usage and attempt of various model is a significant exploration of various ELO models to compare the results of the K value and H value and also the correctness of the models.

REFERENCES

1. AFL Tables. 2015. Afl-Vfl Match, Player and Coaching Stats, Records and Lists. http://afltables.com/afl/afl_index.html.
2. Akhtar, Sohail, and Philip Scarf. 2012. "Forecasting Test Cricket Match Outcomes in Play." International Journal of Forecasting 28 (3): 632-643.
3. Australian Football League. 2015. Laws of Australian Football 2015. Melbourne: Australian Football League.
4. Carbone, Joel, Tony Corke, and Frank Moisiadis. 2016. "The Rugby League Prediction Model: Using an Elo-Based Approach to Predict the Outcome of National Rugby League (Nrl) Matches." International Educational Scientific Research Journal 2 (5).
5. Clarke, Stephen R. 2005. "Home Advantage in the Australian Football League." Journal of Sports Sciences 23 (4): 375-385.
6. Crowder, Martin, Mark Dixon, Anthony Ledford, and Mike Robinson. 2002. "Dynamic Modelling and Prediction of English Football League Matches for Betting." Journal of the Royal Statistical Society: Series D (The Statistician) 51 (2): 157-168.
7. Heo, Moonseong, and Andrew C Leon. 2005. "Comparison of Statistical Methods for Analysis of Clustered Binary Observations." Statistics in medicine 24 (6): 911-923.
8. Hosmer Jr, David W, and Stanley Lemeshow. 2004. Applied Logistic Regression: John Wiley & Sons.
9. Hvattum, Lars Magnus, and Halvard Arntzen. 2010. "Using Elo Ratings for Match Result Prediction in Association Football." International Journal of forecasting 26 (3): 460-470.
10. Jones, Nicholas MP, Stephen D Mellalieu, and Nic James. 2004. "Team Performance Indicators as a Function of Winning and Losing in Rugby Union." International Journal of Performance Analysis in Sport 4 (1): 61-71
11. Lopez, Michael J, and Gregory Matthews. 2014. "Building an Ncaa Mens Basketball Predictive Model and Quantifying Its Success." arXiv preprint arXiv:1412.0248.
12. Maszczyk, Adam, Artur Gołaś, Przemysław Pietraszewski, Robert Roczniok, Adam Zając, and Arkadiusz Stanula. 2014.
13. "Application of Neural and Regression Models in Sports Results Prediction." Procedia - Social and Behavioral Sciences 117 (0): 482-487. doi: http://dx.doi.org/10.1016/j.sbspro.2014.02.249.
14. McHale, Ian, and Alex Morton. 2011. "A Bradley-Terry Type Model for Forecasting Tennis Match Results." International Journal of Forecasting 27 (2): 619-630. doi: http://dx.doi.org/10.1016/j.ijforecast.2010.04.004.
15. Reicher, Stephen. 2001. "The Psychology of Crowd Dynamics." Blackwell handbook of social psychology: Group processes: 182-208.
16. Stefani, Raymond, and Stephen Clarke. 1992. "Predictions and Home Advantage for Australian Rules Football." Journal of Applied Statistics 19 (2): 251-261.

AUTHORS PROFILE

*Er. Keerthi Prasad. K, Research Scholar, RMIT, Australia.

** Dr.NithyaPreetha P, Assistant, Professor, Faculty of Management, SRM Institute of Science and Technology,Kattankulathur,TamilNadu,India.

List of Publications

- **P.Nithya Preetha,** R.Krishna Raj, "A Study on job satisfaction among Para-Medical employees' in Chennai city Hospitals", *IJPSRR, 38(1) May – June 2016 article no:33,p.192-196[IF-0.65]*
- P.S.Rajeswari, K.Sadasivan, **P.Nithya Preetha**, "Opinion mining and Sentiment Analysis of Mobile Internet Usage", *IJCTA, 2017,Vol-10,number:31,p.299-308[IF-0.097]*
- P.S.Rajeswari,K.Sadasivan, **P.Nithya Preetha**,C.Samson Santhosh Kumar, "An Analytical Study on Consumer Buying behaviur of Bab care Products", *JARDCS,July 2017,article no:07-special Issue,p.278-284[IF-0.167]*

***GokulPrasad.K,Research Scholar,VIT.

****Dr.P.S.Rajeswari,Assistant, Professor, Faculty of Management, SRM Institute of Science and Technology,Chennai,India