IJACSSEJournal- International Journal of Advanced Computer Systems and Software Engineering

E-ISSN: 2716-5256 online

A comparative Analysis of translation software using Data science Approach

Murtaza M. J. Farooque[a*], Buthaina S.A. Jadad[a]

a College of Commerce and Business Administration, Dhofar University, Salalah, Sultanate of Oman

** Corresponding author: mfarooque@du.edu.om*

ARTICLE HISTORY
Received: 10 February 2021
Accepted: 6 April 2021
Published Online: 29 April 2021

KEYWORDS
Translation;
Reliability;
Software

ABSTRACT

Readers who find difficulty in Understanding any language take the help of translator. In this era human translators are now replaced by translation software. Many students are using translation software for translating English texts into Arabic. However often these software Applications do not convey the real sense of the original text. It can be misleading several times. In this research an attempt is made to evaluate the reliability of different translation software while translating English into Arabic statements. The Machine translating is Compared with human Translation.

1.0 INTRODUCTION

In order to understand any language, a person must know the vocabulary and grammar of that language. Many a time a person, who is not comfortable with a language takes the help of a translator, who translates the spoken or written content into the language which the he understands. The translation gives an equivalent or similar meaning of the original content. With the development of the technology, the human translators are replaced by translation software applications. Translation is a difficult task for human, it remains a challenge for artificial intelligence. However often these software applications do not convey the real sense of the original text. It can be misleading several times.

2.0 Review of Litreture

Data Mining and machine learning has been adopted in various fields by the researchers' like for finding out customer churn in a shopping mall [M. A. Khan, M. I. Khan, M. Aref, and S. Khan,2016], in alternative medicine (Farooque, M. Aref, M. I. Khan, and S. Mohammed 2016), [M. M. J. Farooque, S. Abidurrahman, and F. Sarkhawas 2011], in finding out Fault Diagnosis of Rotating wheel [T. S. Mohammed, M. A. A. Rasheed, M. S. Al-Ani, Q. Al-Shayea, and F. B. I. Alnaimi, 2020]
[M. A. A. Rasheed and M. N. Alraja 2020] , and also in detection of faults in information system [M. Aref 2020], for age prediction [G. Sable, M. M. Junaid Farooque, and M. Rajput 2020] for semantic analyiss of opinions in social media [M. M. J. Farooque 2018], in digital marketing [S. Sayyad, A. Mohammed, V. Shaga, A. Kumar, and K. Vengatesan 2020].

3.0 METHODOLOGY

The following methodology was adopted to evaluate and compare the different Translation software in comparison with human translators.

2.1 Objective

To find and evaluate the reliability of the Software translation while translating English statements into Maintaining the Integrity of the Specifications.

2.3 Design of the experiments

A set of 15 different statements in English were prepared out of which 5 were simple, 5 were moderate and 5 were difficult statements. These sentences were given to translation to 15 human translators to translate into Arabic. These statements were also translated using following four different translation software

1. Google Translation
2. Microsoft Translator
3. Free translator.com
4. Babylon Translator

The translated sentences were given to three human experts to judge quality of translation. To evaluate the quality of translations i.e Evaluation Matrix was Prepared using The evaluation matrix was prepared and Praposed by [Muñoz, I. D. Maria Cristina Toledo Báez 2010]. The evaluatin matrix is given in table 1.

For each statement the expert instructed to give score from 1 to 5 for each of this eight criteria. It was not disclosed to the experts which statement are translated by humans and which are translated by the software. There were in all 19 Translators (15 humans and 4 software) evaluated by 3 experts.

RESULTS AND DISCUSSION

It was observed that:

- In case of simple statement there was very minute difference in the scores given by the evaluators to manual translation and translation software.

In case of moderate and difficult sentences there are huge difference in the scores given by the evaluators.

To Further reconfirm the analysis two factor Anova without replications was done for all the three classes of the statement (simple, moderate and difficult). The result of analysis is reported in table 2, 3, and 4.

3.1 Generation of Decision Tree

The collected data was Merged and converted into CSV format. The Criteria from table were taken as attributes, one more column was added for translator (Human or software). This was taken as class attribute. The decision tree was generated in Weka data mining software using Random-tree algorithm. The generated tree is shown in figure 1. The result of data mining is given in table 5 and 6.

Recommendation

The correct meaning of sentences, it is recommended to use multiple sources. Translation software applications can be used to translate the words but not documents and sentences.

Table 1 Evaluation Matrix

Criteria	*E1*	*E2*	*E3*
The translation conveys the meaning of the original sentence			
There is no disordering of the words in translation sentence			
The translation does not have any grammatical mistake			
The translation retain gender of the original text			
The translation retain the tence of the original text			
No of mistranslation words in the sentence			
The translation is accurate			
The translation is complete			

Table 2

Simple Statements							
Anova: Two-Factor Without Replication							
SUMMARY	Count	Sum	Average	Variance			
5	5	24.73333	4.946667	0.005333			
5	5	24.46667	4.893333	0.021333			
4.416667	5	22.8	4.56	0.063			
5	5	24.33333	4.866667	0.033333			
4.75	5	23.43333	4.686667	0.05075			
4.666667	5	23.7	4.74	0.058			
4	5	22.8	4.56	0.03175			
4.666667	5	24.73333	4.946667	0.005333			
E2	8	37	4.625	0.036746			
E3	8	37	4.625	0.036746			
E1	8	39	4.875	0.053571			
E2	8	39	4.875	0.035714			
E3	8	39	4.875	0.035714			
ANOVA							
z	SS	df	MS	F	P-value	F crit	
Rows	0.914111	7	0.130587	7.69238	3.40461E-05	2.35926	
Columns	0.6	4	0.15	8.835905	9.58128E-05	2.714076	
Error	0.475333	28	0.016976				
Total	1.989444	39					

Table 3

Moderate Statements					
Anova: Two-Factor Without Replication					
SUMMARY	*Count*	*Sum*	*Average*	*Variance*	
4.916667	5	18.41667	3.683333	1.14875	
4.5	5	20.26667	4.053333	0.42075	
3.166667	5	15.3	3.06	2.540222	
4.916667	5	16.1	3.22	1.816306	
4.916667	5	16.63333	3.326667	1.567583	
4.5	5	15.91667	3.183333	1.1125	
2.5	5	12.13333	2.426667	2.503972	
4.166667	5	19.13333	3.826667	0.623556	
E2	8	36	4.5	0.08254	
E3	8	35.4	4.425	0.038016	
E1	8	22	2.75	2.321429	
E2	8	19.75	2.46875	0.40067	
E3	8	20.75	2.59375	0.373884	

ANOVA								
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*		
Rows	9.074083	7	1.296298	2.700282	0.028548854	2.35926		
Columns	33.49288	4	8.373219	17.44202	2.74454E-07	2.714076		
Error	13.44168	28	0.48006					
Total	56.00864	39						

Table 4 Difficult Statements

Difficult						
Anova: Two-Factor Without Replication						
SUMMARY	*Count*	*Sum*	*Average*	*Variance*		
2.583333	5	13.51667	2.703333	1.704083		
3.833333	5	18.78333	3.756667	0.278417		
2.666667	5	14.43333	2.886667	1.295472		
5	5	14.61667	2.923333	1.696056		
3.833333	5	15.83333	3.166667	1.677639		
2.25	5	12.03333	2.406667	1.573139		
2.083333	5	10.56667	2.113333	1.849222		
4	5	16.4	3.28	1.374222		
E2	8	32.46667	4.058333	0.074206		
E3	8	31.46667	3.933333	0.057143		
E1	8	20.5	2.5625	2.102679		
E2	8	15.5	1.9375	0.424107		
E3	8	16.25	2.03125	0.40067		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows	9.254215	7	1.322031	3.044797	0.016383757	2.35926
Columns	33.63558	4	8.408896	19.3667	9.75041E-08	2.714076
Error	12.15742	28	0.434193			
Total	55.04722	39				

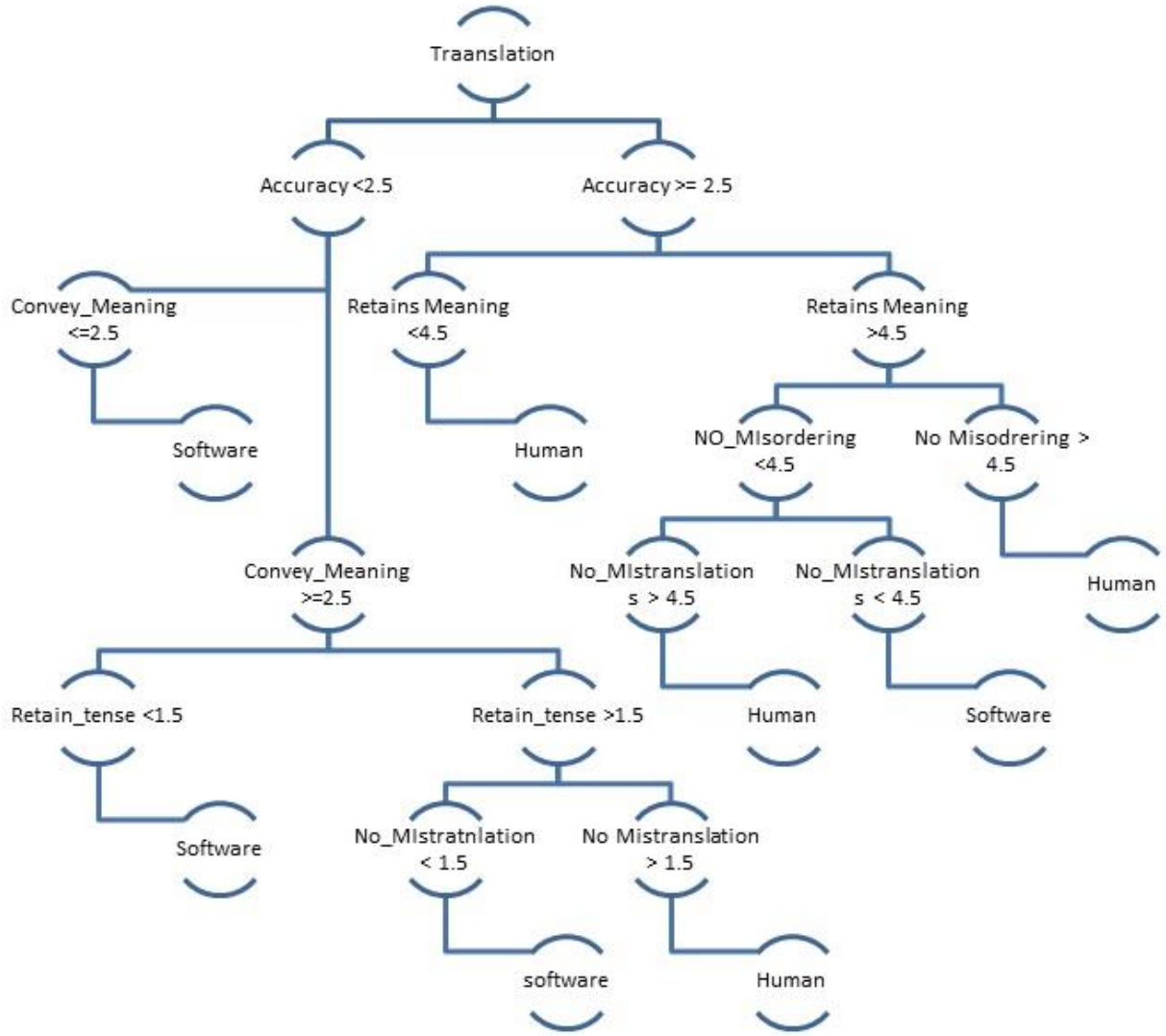
Traanslation
Accuracy <2.5
Accuracy >= 2.5
Convey_Meaning <=2.5
Retains Meaning <4.5
Retains Meaning >4.5
Software
Human
NO_MIsordering <4.5
No Misodrering > 4.5
Convey_Meaning >=2.5
No_MIstranslation s > 4.5
No_MIstranslation s < 4.5
Human
Retain_tense <1.5
Retain_tense >1.5
Human
Software
Software
No_MIstratnlation < 1.5
No Mistranslation > 1.5
software
Human

Figure `1

Table 5 Error statistics of decision tree

Parameters	*Value*
Correctly Classified Instances	**51 (89.47%)**
Incorrectly Classified Instances	**06 (10.53%)**
Total No. of Instances	**57 (100%)**
Relative absolute error	**43.00113 %**
Kappa statistic	**0.6042**
Mean absolute error	**0.1183**
Root mean squared error	**0.3217**
Root relative squared error	**88.0097**

Table 6 Confusion Matrix

	Human	**Software**
Human	**45**	**3**
Software	**3**	**6**

References

M. M. Junaid Farooque, M. Aref, M. I. Khan, and S. Mohammed, “Data Mining application in classification scheme of human subjects according to ayurvedic prakruti - temperament,” *Indian Journal of Science and Technology*, vol. 9, no. 13, pp. 1–4, Apr. 2016, doi: 10.17485/ijst/2016/v9i13/84658.

M. A. Khan, M. I. Khan, M. Aref, and S. Khan, “CLUSTER & ROUGH SET THEORY BASED APPROACH TO FIND THE REASON FOR CUSTOMER CHURN,” *International Journal of Applied Business and Economic Research* , vol. 14, no. 1, pp. 439–455, 2016.

T. S. Mohammed, M. A. A. Rasheed, M. S. Al-Ani, Q. Al-Shayea, and F. B. I. Alnaimi, “Fault Diagnosis of Rotating Machine Based on Audio Signal Recognition System: An Efficient Approach,” *International Journal of Simulation -- Systems, Science & Technology*, vol. 21, no. 1, pp. 1–8, 2020.

M. A. A. Rasheed and M. N. Alraja, “Data mining approach to assess condition of rotating machine using sound signal,” *Journal of Theoretical and Applied Information Technology*, vol. 80, no. 1, 2015.

M. Aref, “Fault reporting process of business information systems,” *International Journal of Economic Research*, vol. 13, no. 5, pp. 2277–2283, 2016, Accessed: Mar. 23, 2021. [Online]. Available: https://www.researchgate.net/publication/310490290_Fault_reporting_process_of_business_information_systems.

G. Sable, M. M. Junaid Farooque, and M. Rajput, “Pretrained Deep Neural Networks for Age Prediction from Iris Biometrics,” in *Computational Intelligence Techniques and Their Applications to Software Engineering Problems*, CRC Press, 2020, pp. 189–19

. M. J. Farooque, S. Abidurrahman, and F. Sarkhawas, “Identification of Mizaj (Temprament) Based on Tibbi Fundamentals using Classification as Tool,” in *Proceedings of National Conference on Data Mining (NCDM-2011)*, 2011, pp. 94–95, Accessed: Mar. 30, 2021. [Online]. Available: https://www.researchgate.net/publication/278405432.

M. M. J. Farooque, “Make Semantic Analysis of Opinions about social networking using Blog Search Engines,” *Computer Reviews Journal*, vol. 2, pp. 296–298, 2018.

S. Sayyad, A. Mohammed, V. Shaga, A. Kumar, and K. Vengatesan, “Digital Marketing Framework Strategies Through Big Data,” in *Lecture Notes on Data Engineering and Communications Technologies*, Dec. 2020, vol. 31, pp. 1065–1073, doi: 10.1007/978-3-030-24643-3_127