

**TEXT CLASSIFICATION ON NEWS ARTICLES**

**NG KANG WEI**

**DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION  
TECHNOLOGY  
UNIVERSITY OF MALAYA  
KUALA LUMPUR**

**2020**

**TEXT CLASSIFICATION ON NEWS ARTICLES**

**NG KANG WEI**

**RESEARCH PROJECT SUBMITTED TO THE  
DEPARTMENT OF COMPUTER SCIENCE AND  
INFORMATION TECHNOLOGY  
UNIVERSITY OF MALAYA, IN PARTIAL FULFILMENT  
OF THE REQUIREMENTS FOR THE DEGREE OF  
MASTER OF DATA SCIENCE**

**2020**

**UNIVERSITI MALAYA**

**ORIGINAL LITERARY WORK DECLARATION**

Name of Candidate: (I.C./Passport No.: )

Registration/Matric No.:

Name of Degree:

Title of Project Paper/Research Report/Dissertation/Thesis ("this Work"):

Field of Study:

I do solemnly and sincerely declare that:

- (1) I am the sole author/writer of this Work;
- (2) This work is original;
- (3) Any use of any work in which copyright exists was done by way of fair dealing and for permitted purposes and any excerpt or extract from, or reference to or reproduction of any copyright work has been disclosed expressly and sufficiently and the title of the Work and its authorship have been acknowledged in this Work;
- (4) I do not have any actual knowledge nor do I ought reasonably to know that the making of this work constitutes an infringement of any copyright work;
- (5) I hereby assign all and every rights in the copyright to this Work to the University of Malaya ("UM"), who henceforth shall be owner of the copyright in this Work and that any reproduction or use in any form or by any means whatsoever is prohibited without the written consent of UM having been first had and obtained;
- (6) I am fully aware that if in the course of making this Work I have infringed any copyright whether intentionally or otherwise, I may be subject to legal action or any other action as may be determined by UM.

Candidate's Signature

Date:

Subscribed and solemnly declared before,

Witness's Signature

Date:

Name:

Designation:

## TEXT CLASSIFICATION ON NEWS ARTICLES

### ABSTRACT

An abstract must not exceed 500 words, typed in a single paragraph with double-spacing, and written in Bahasa Malaysia and English language. A maximum of five (5) keywords should also be listed below the abstract.

**Keywords:** Keyword, keyword, keyword, keyword.

## **ABSTRAK**

Ini merupakan abstrak dalam Bahasa Melayu (satu perenggan).

## **ACKNOWLEDGEMENTS**

Thanks guys. I owe you many.

## TABLE OF CONTENTS

Abstract .....	iii
Abstrak .....	iv
Acknowledgements .....	v
Table of Contents .....	vi
List of Figures .....	viii
List of Tables.....	ix
List of Appendices .....	xi
 <b>CHAPTER 1: INTRODUCTION</b> .....	 <b>1</b>
1.1 Introduction.....	1
1.1.1 Problem Statement .....	2
1.1.2 Research Objectives .....	2
1.1.3 Research Questions.....	2
1.1.4 Research Motivation.....	2
1.1.5 Research Significance.....	3
1.1.6 Expected Outcome .....	4
 <b>CHAPTER 2: LITERATURE REVIEW</b> .....	 <b>5</b>
2.1 Introduction.....	5
2.2 Dimension Reduction.....	6
2.2.1 Single Value Decomposition (SVD).....	6
2.2.2 Nonnegative Matrix Factorization (NMF) .....	6
2.2.3 Principal Component Analysis (PCA).....	7
2.2.4 Summary .....	8

2.3	Document Classification .....	8
2.3.1	Support Vector Machine.....	8
2.3.2	k-Nearest Neighbours (kNN).....	9
2.3.3	Neural Network .....	10
2.4	Conclusion .....	11
<b>CHAPTER 3: RESEARCH METHODOLOGY .....</b>		<b>12</b>
3.1	Introduction.....	12
3.2	Process Flow .....	12
3.3	Conclusion .....	13
References .....		14
Appendices.....		16



## LIST OF FIGURES

## LIST OF TABLES



## LIST OF APPENDICES

Appendix A: Manuals, Technical Specifications, Documentations, Example Scenarios .....	16
Appendix B: Try .....	17

## **CHAPTER 1: INTRODUCTION**

### **1.1 Introduction**

As optical character recognition technology advances, large number of physical documents are made electronically available and many more articles are created and available online. The information contain within these documents would need to be extracted, analyzed, stored and made searchable so that others can make use of it. Natural language processing (NLP) methods are needed to analyze the content or the sentiment in the text.

Document classification is one of the NLP method that categorize the text into different topics or categories. This classification would be helpful to future researchers who want to find some topic from the text. The researchers could just focus on the category they are interested in rather than skimming through all the documents to obtain the intended information.

The technology breakthrough in recent years, machine learning algorithms, processing power of processors have been a boost in NLP field. With the breakthroughs, there has been an advancement of the methods used in NLP with artificial intelligence without the need of intervention of domain experts.

There are several approaches to the document classification problem, multilabel where each document can belong to several categories or classification, where each document can only belong to one category. Within machine learning methods, there is clustering which is an unsupervised learning method or the supervised learning approach. This shall focus in the the direction of classification rather than multilabel and clustering.

In document classification most of the algorithms used vector space model to represent the unstrucutured textual data. (Ababneh, Almanmomani, Hadi, El-Omari, & Alibrahim, 2014). This vector space model represent the sequence of the textual features and their

weight, it is easy to implement and provide uniform representation for documents. However, it has a drawback, it represent all the words in the documents, the dimension of the vector would be huge. This huge vector space model would impact the performance of the machine learning tasks. (Moldagulova & Sulaiman, 2018). Therefore, this study would focus on the dimension reduction on vector space model on document classification.

### **1.1.1 Problem Statement**

Term vectors is one of the most commonly used document representation algorithms, but dimension of the feature space can too large and the vectors can be too sparse. (Moldagulova & Sulaiman, 2018)

### **1.1.2 Research Objectives**

1. To identify a document representation algorithm that is optimized to extract the features from news articles
2. To investigate the machine learning (ML) algorithm used in document classification and apply the most suitable algorithm.
3. To evaluate the performance of the document representation and document classification algorithm.

### **1.1.3 Research Questions**

1. Which dimension reduction algorithm is optimized for news article?
2. How complexities of the features influence the accuracy?
3. Which is the best machine learning algorithms in document classification?

### **1.1.4 Research Motivation**

In the age of big data, the amount of data generated and collected is growing at an explosive rate. Much of the data generated and collected is in the form of unstructured

text. The value contained within the text cannot be extracted and be useful to us without natural language processing (NLP). Document classification is one of the pillars in natural language processing.

In document classification, the unstructured text would be given a label or multiple label dependent on the method used. These labels would make the data more meaningful and searchable. Users can search for a topic just by selecting text with the particular label rather than performing a manual word search on all the text document.

Bag of words is the most commonly used document representation method in document classification. Bag of words would produce a vector space model of the textual data representation. The dimension of this vector space model would be big because of the amount of words in the documents. This huge dimension of vector space model would decrease the performance of the document classification algorithms.

With dimension reduction algorithms, the dimension of the vector space would be decreased and the performance of the machine learning algorithms would be increased. However, the effect of the different dimension reduction algorithms might have a different effect on the performance of the machine learning algorithms.

This study would investigate the effect of the dimension reduction algorithms on the performance of the machine learning algorithms.

#### **1.1.5 Research Significance**

This research would classify news articles into different categories. In order to do that, first the features have to be extracted from the documents. The features might need to be compressed. Then the features are used to train machine learning models. After that, the trained machine learning models are validated and tested to evaluate its performance.

The document representation method is the most commonly used bag of words approach, Term Frequency - Inverse Document Frequency (TF-IDF). In this approach, the documents

are converted into vector space models. Due to the large amount of words in the documents, the vector space would be large and sparse, this is known as the curse of dimensionality problem. This large and sparse vector space would be an obstacle to document classification, machine learning models accuracy would be impacted due to the large vector space.

By applying dimension reduction algorithms to the vector space model, the vector space and sparsity of the vector could be reduced. With the reduced vector, the accuracy of the machine learning models would be increased. However, which of the dimension reduction algorithms would perform best for document classification on news articles? This study would try to answer this question by studying which of the dimension reduction algorithm is most suitable and applying it on a dataset.

#### **1.1.6 Expected Outcome**

1. A prototype document classification application with 80
2. A dimension reduction algorithm is applied on the extracted features of the documents
3. A best suited machine learning algorithm is applied on the document classification application
4. Evaluate the accuracy of the document classification application



## CHAPTER 2: LITERATURE REVIEW

### 2.1 Introduction

In text classification proposed in this study, there are 3 stages namely document representation, dimension reduction and classification. For document representation the chosen method is Term Frequency-Inverse Document Frequency (TF-IDF) which is based on the bag of words method. TF-IDF provide a measure of weight or importance to the words. The value of TF-IDF estimate the amount of information provided by each word in its document. (Arroyo-Fernández, Méndez-Cruz, Sierra, Torres-Moreno, & Sidorov, 2019) The value of TF-IDF increases proportionally to the number of times a word appears in a document but is offset by the frequency of the word in the corpus. This means that if a word appears for many times in a document but it also appears for many times in many other documents in the corpus, then it is not an important word. TF-IDFThe formula for TF-IDF is shown below:

$$TFIDF = tf \times \log_e \frac{N}{df} \quad (2.1)$$

where:

$tf$  = the number of times a word appears in a document

$N$  = the total number of documents in the corpus

$df$  = the number of documents that contain the word

The remaining parts are dimension reduction and classification, the methods in these 2 parts would be evaluated and chosen.

## **2.2 Dimension Reduction**

### **2.2.1 Single Value Decomposition (SVD)**

Single value decomposition is one of the most commonly used dimension reduction algorithms. It generalizes a complex matrix with many dimensions into a matrix of lower dimension via an extension of the polar decomposition. SVD detects the part of the data that contains the maximum variance in a set of orthogonal basis vectors. The data with the maximum variance would be the most prominent features of the data. (Sweeney et al., 2014)

Latent Semantic Analysis (LSA) a technique applied in natural language processing that apply SVD in its process. SVD is applied in LSA to transform the features by dropping the least significant values in the matrix thus reducing the dimensions of the matrix. (Karami, 2017)

Even though SVD has been applied in LSA and in other fields, it has been found that SVD is not as efficient as principal component analysis (PCA) and has a few drawbacks. SVD can extract the prominent features of the matrix but it does not help in reducing the sparsity of the matrix. In some of text clustering algorithms that used SVD for dimension reduction only find SVD useful when the features are redundant. (Narhari & Shedge, 2017)

### **2.2.2 Nonnegative Matrix Factorization (NMF)**

Nonnegative matrix factorization (NMF) is a multiplicative updating solution to decompose a nonnegative temporal-frequency data matrix into the sum of individual components. The sum of individual components are calculated from a nonnegative basis matrix. (Chien, 2019)

NMF and its variant have found to be applied in many fields such as feature extractions, segmentation and clustering, dimension reduction and others. However, the nonnegativity constraints of NMF proved to be problematic when the data matrix is not strictly non-

negative. The semi-NMF relaxes the non-negativity constraint of NMF so that the resulting matrix has mixed signs. (Allab, Labiod, & Nadif, 2017)

Researchers who performed experiments to compare the performance of SVD, NMF and PCA have found that NMF do not perform as well as PCA. SVD and NMF achieved a similar accuracy in the experiment. This might due to both SVD and NMF are dependent on matrix decomposition technique while PCA is dependent on eigenvalue decomposition. (Mohamed, 2019)

NMF might be more suited for clustering as it took the least amount of time in clustering the data compared with SVD and PCA. (Mohamed, 2019). This advantage of NMF over SVD and PCA is negligible in this study since this study would focus on classification rather than clustering.

### **2.2.3 Principal Component Analysis (PCA)**

Principal component analysis is one the state of the art dimension reduction algorithm. The main purpose of PCA is to project data samples from high dimensional space into low dimensional space by linear transformation while preserving the original data features as much as possible. (Ma & Yuan, 2019) In other words, PCA is used to emphasize the variations in the data, bring out the important features in the data.

PCA is no stranger to the text classification field. It has been applied to different languages of text classification other than English. Label Induction Grouping (LINGO) a technique used in categorizing Indian Marathi language text document. PCA is applied in LINGO performed better than SVD as PCA extract the features better and has less loss of information. (Narhari & Shedge, 2017)

In another research on text classification on Arabic text and English text, it is also found that PCA outperformed SVD and NMF. The researchers found that PCA yields better result in terms of accuracy and normalized mutual information. The advantage of PCA is

that after transforming the matrix, the important features vector are orthogonal to each other. PCA also has a whitening transform that reduce noises in the data which in turn boost the performance and the accuracy of the machine learning algorithm.(Mohamed, 2019)

A variant of PCA which is in the form of a tree structure has been applied on the dimension reduction on sentiment analysis. The technique is called tree-structured multi-linear principal component analysis (TMPCA). TMPCA can retain the sentence structure and word correlations. (Su, Huang, & Kuo, 2018). However, this is a novel technique and PCA has been proven to be effective enough to handle the amount of data in this study.

#### **2.2.4 Summary**

The 3 dimension reduction or matrix decomposition algorithms above are considered blind source separation (BSS) methods, unsupervised learning algorithms. Its performance might not be as good as a deep learning algorithm such as Word2vec but deep learning algorithm's performance is dependent on the the scale of the data. Deep learning algorithm can only perform well when there is a lot of data. In our study, the data might not be sufficient to use a deep learning algorithm, thus the above methods are reviewed. Out of the 3 dimension reduction algorithms reviewed above, PCA seems to be the most promising in the field of text classification. Therefore, PCA would be chosen as the dimension reduction algorithm in this study.

### **2.3 Document Classification**

#### **2.3.1 Support Vector Machine**

Support vector machine is a machine learning algorithm that construct a hyper plane to separate the examples into different classes. It has been proven to be very effective in dealing with high dimensional data. (Shinde, Joeg, & Vanjale, 2017). It is also proven to produce dramatically best results for topic modelling in experiments with the Reuters dataset.

(Dumais, Platt, Heckerman, & Sahami, 1998). Various issues need to be considered when applying SVM in document classification, the processing of the data, which kernel to use, and the parameters of SVM. A variant of SVM, called one-class SVM which is trained only with positive information has been used in document classification. (L. M. Manevitz & Yousef, 2002). The authors experimented with different kernels of SVM (linear, sigmoid, polynomial, and radial basis) with different type of document representation method (binary representation, frequency representation, TF-IDF representation, and Hadamard representation). The best result (F1 score of 0.507) is achieved with binary representation, feature length 10 and with linear kernel function.

In another research, the researchers apply SVM in the classification on web document instead of news or ordinary text document. The document representation method used in this research is vector space model, just the nouns term in the web pages. The researchers experimented with different SVM kernels and varying the size of the training sets. Expectedly, the precision, recall and accuracy increased as the size of the training set increase. Linear kernel achieved the best result out of the various SVM kernels, a classification accuracy of 80% is achieved. (Shinde et al., 2017).

SVM is relatively new compare to others algorithm in the field of document representation. It is not very efficient with large number of observations and it can be tricky to find an appropriate kernel for the problem.

### **2.3.2 k-Nearest Neighbours (kNN)**

kNN is a classification machine learning algorithm that classify objects based on the closest training examples in the feature space based on a similarity measure. It is a simple and effective classification, as it only need 3 prerequisites. The 3 prerequisites are training dataset, similarity measure and the value of k which is the number of closest neighbours to be considered.

kNN needs minimal training, it only needs to plot the training examples into a feature space. kNN has been applied in document classification before, it is found that kNN take significant longer time to classify a document into a topic. This is because kNN uses all the features of the data to compute the distance. Since the authors are using term vector space document representation method, the dimension of the feature space is high, thus the more time is needed for kNN to compute all the distance between the test object with the training objects. Other than the time taken to compute the distance, the k value is another obstacle in kNN algorithm. In a high dimensionality feature space and the points are not evenly distributed, the k value is hard to be determined.

To overcome the problems mentioned above, the authors applied term vector space reduction method, divide the document feature matrix into parts. Term vector space reduction reduces the sparsity of the document term matrix by removing the features less appeared in the corpus. By reducing the term vector space, a slight deterioration in the classification accuracy but the time cost is dramatically reduced. kNN still achieved an accuracy of 92.7% but the time taken reduced from 53 minutes to 11 minutes. (Moldagulova & Sulaiman, 2018)

### **2.3.3 Neural Network**

Neural network has a resurgence in recent years as there is a breakthrough in the neural network as Geoffrey Hinton (et al.) discovered a technique called Contrastive Divergence that could quickly model inputs in a Restricted Boltzmann Machine (RBM). RBM is a 2-layer neural network that model the input by bouncing it through the network. This process is less computationally complex than backpropagation. (Hinton, 2002).

Currently, neural network is applied in deep learning to solve various problems, document representation is one of them. Ranjan (et al.) applied Lion Fuzzy Neural Network on document classification. The researchers used WordNet ontology to retrieve

the semantic of the words, and then added the context information onto it, thus the features obtained are semantic-context features. The classification part is performed by Lion Fuzzy Neural Network, which is a variant of Back Propagation Lion (BPLion) Neural Network that includes fuzzy bounding and Lion Algorithm. The neural network model used is trained incrementally. It achieves a higher accuracy than Naïve Bayes and some variant of the Lion Neural Network. (Ranjan & Prasad, 2018)

Other than the modified neural network shown above, a simple feed-forward neural network is also efficient in document classification. By using the Hadamard product as document representation method, a simple neural network also can achieve a good classification accuracy in document classification compare to Naïve Bayes, kNN, and SVM. (L. Manevitz & Yousef, 2007)

## **2.4 Conclusion**

From the review of dimension reduction algorithms, PCA performed best compared to SVD and NMF. In addition, PCA performed well in text classification field.

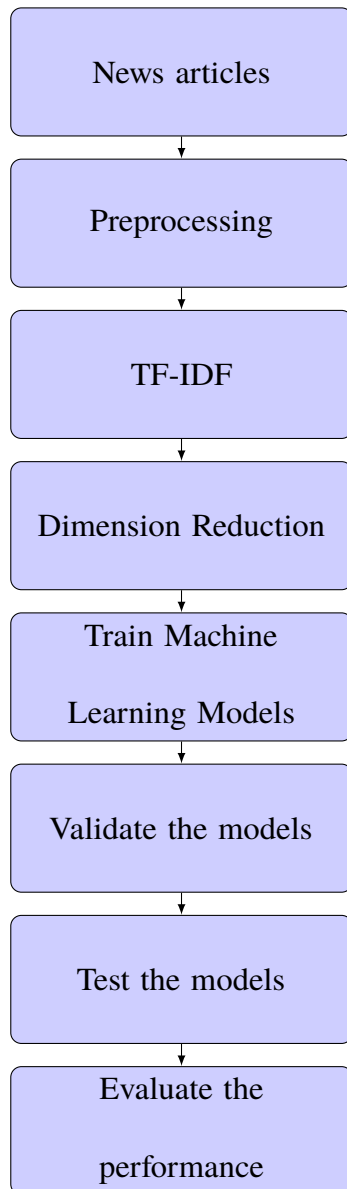
In machine learning algorithms for text classification, all 3 machine learning algorithms reviewed above would be applied. One of the objectives of this study is to investigate the performance of different machine learning algorithms in text classification. The same dataset would be used to train 3 models and the performance would be evaluated.

## CHAPTER 3: RESEARCH METHODOLOGY

### 3.1 Introduction

This section would illustrate the process flow of how to carry out the experiments to fulfil the aforementioned objectives.

### 3.2 Process Flow



First, the news articles must undergo preprocessing. The preprocessing includes converting all the words to lowercase, numbers and punctuations removal, stop words removal, stemming and others.



After preprocessing, TF-IDF algorithm would be applied on the text to extract the features from the text. The resulting vector space from TF-IDF would be undergo a dimension reduction algorithm.

After vector space model dimension is reduced, the vector space model is used to train a machine learning algorithm. The trained machine learning model is validated and tested and its performance is evaluated.

The vector space model of the news articles from TF-IDF can undergo different dimension reduction algorithm or none at all. The classification accuracy stemming from this differences would be compared.

The machine learning algorithms use to train the models would be the few document classification machine learning algorithms chosen in chapter 2, namely SVM, kNN and Neural Network.

### **3.3 Conclusion**

With the method mentioned above, the experiments would be carry out and the results would be recorded. The results would be compared and the differences would be analysed.

## REFERENCES

- Ababneh, J., Almanmomani, O., Hadi, W., El-Omari, N., Alibrahim, A. (2014, 02). Vector space models to classify arabic text. *International Journal of Computer Trends and Technology (IJCTT)*, 7, 219-223. doi: 10.14445/22312803/IJCTT-V7P109
- Allab, K., Labiod, L., Nadif, M. (2017, Jan). A semi-nmf-pca unified framework for data clustering. *IEEE Transactions on Knowledge and Data Engineering*, 29(1), 2-16. doi: 10.1109/TKDE.2016.2606098
- Arroyo-Fernández, I., Méndez-Cruz, C.-F., Sierra, G., Torres-Moreno, J.-M., Sidorov, G. (2019). Unsupervised sentence representations as word information series: Revisiting tf-idf. *Computer Speech and Language*, 56, 107-129. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0885230817302887> doi: <https://doi.org/10.1016/j.csl.2019.01.005>
- Chien, J.-T. (2019). Chapter 5 - nonnegative matrix factorization. In J.-T. Chien (Ed.), *Source separation and machine learning* (p. 161 - 229). Academic Press. Retrieved from <http://www.sciencedirect.com/science/article/pii/B9780128045664000176> doi: <https://doi.org/10.1016/B978-0-12-804566-4.00017-6>
- Dumais, S., Platt, J., Heckerman, D., Sahami, M. (1998). Inductive learning algorithms and representations for text categorization. In *Proceedings of the seventh international conference on information and knowledge management* (pp. 148–155). New York, NY, USA: ACM. Retrieved from <http://doi.acm.org/10.1145/288627.288651> doi: 10.1145/288627.288651
- Hinton, G. E. (2002, August). Training products of experts by minimizing contrastive divergence. *Neural Comput.*, 14(8), 1771–1800. Retrieved from <http://dx.doi.org/10.1162/089976602760128018> doi: 10.1162/089976602760128018
- Karami, A. (2017, Nov). Taming wild high dimensional text data with a fuzzy lash. In *2017 IEEE International Conference on Data Mining Workshops (ICDMW)* (p. 518-522). doi: 10.1109/ICDMW.2017.73
- Ma, J., Yuan, Y. (2019). Dimension reduction of image deep feature using pca. *Journal of Visual Communication and Image Representation*, 63, 102578. Retrieved from <http://www.sciencedirect.com/science/article/pii/S1047320319301932> doi: <https://doi.org/10.1016/j.jvcir.2019.102578>

- Manevitz, L., Yousef, M. (2007). One-class document classification via neural networks. *Neurocomputing*, 70(7), 1466 - 1481. Retrieved from <http://www.sciencedirect.com/science/article/pii/S092523120600261X> (Advances in Computational Intelligence and Learning) doi: <https://doi.org/10.1016/j.neucom.2006.05.013>
- Manevitz, L. M., Yousef, M. (2002, March). One-class svms for document classification. *J. Mach. Learn. Res.*, 2, 139–154. Retrieved from <http://dl.acm.org/citation.cfm?id=944790.944808>
- Mohamed, A. (2019). An effective dimension reduction algorithm for clustering arabic text. *Egyptian Informatics Journal*. Retrieved from <http://www.sciencedirect.com/science/article/pii/S1110866518301579> doi: <https://doi.org/10.1016/j.eij.2019.05.002>
- Moldagulova, A., Sulaiman, R. B. (2018, Oct). Document classification based on knn algorithm by term vector space reduction. In *2018 18th international conference on control, automation and systems (iccas)* (p. 387-391).
- Narhari, S. A., Shedge, R. (2017, Dec). Text categorization of marathi documents using modified lingo. In *2017 international conference on advances in computing, communication and control (icac3)* (p. 1-5). doi: 10.1109/ICAC3.2017.8318771
- Ranjan, N. M., Prasad, R. S. (2018). Lfnn: Lion fuzzy neural network-based evolutionary model for text classification using context and sense based features. *Applied Soft Computing*, 71, 994 - 1008. Retrieved from <http://www.sciencedirect.com/science/article/pii/S1568494618304046> doi: <https://doi.org/10.1016/j.asoc.2018.07.016>
- Shinde, S., Joeg, P., Vanjale, S. (2017, 09). Web document classification using support vector machine. In *2017 international conference on current trends in computer, electrical, electronics and communication (ctceec)* (p. 688-691). doi: 10.1109/CTCEEC.2017.8455102
- Su, Y., Huang, Y., Kuo, C. . J. (2018, Aug). Efficient text classification using tree-structured multi-linear principal component analysis. In *2018 24th international conference on pattern recognition (icpr)* (p. 585-590). doi: 10.1109/ICPR.2018.8545832
- Sweeney, E., Vogelstein, J., Cuzzocreo, J., A Calabresi, P., Reich, D., M Crainiceanu, C., T Shinohara, R. (2014, 04). A comparison of supervised machine learning algorithms and feature vectors for ms lesion segmentation using multimodal structural mri. *PloS one*, 9, e95753. doi: 10.1371/journal.pone.0095753

**APPENDIX A: MANUALS, TECHNICAL SPECIFICATIONS,  
DOCUMENTATIONS, EXAMPLE SCENARIOS**

## APPENDIX B: TRY

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.