

**Asia Pacific College**

**School of Computing and Information Technology**

**Magallanes, Makati City**

**IDENTIFYING FAKE NEWS IN FACEBOOK**

**Project Documentation Submitted**

**To the Faculty of School of**

**Computing and Information Technologies**

**Of**

**Asia Pacific College**

**by**

**Marc Anthony Nares**

**Aleo De Leon**

**Joshua Cruz**

**Wyatt Holgado**

**BSCS-SS / SS152**

**To**

**Sir Manuel Sebastian Sanchez**

Contents

[Abstract 3](#_Toc490162734)

[I. Introduction 4](#_Toc490162735)

[Project Context 4](#_Toc490162736)

[Purpose and Description 4](#_Toc490162737)

[Objectives 5](#_Toc490162738)

[Scope and Limitations 5](#_Toc490162739)

[II. Review of Related Literature 5](#_Toc490162740)

[III. Technical Background 6](#_Toc490162741)

[IV. Design and Methodology 7](#_Toc490162742)

[V. Conclusions 8](#_Toc490162743)

[VI. Appendices 8](#_Toc490162744)

[VII. References 9](#_Toc490162745)

# Abstract

This document circles around fake news on the internet. In this research the researchers will create a model that identifies if a link posted on Facebook leads to an article that is fake or not. The researchers will use SVM algorithm for classifying the link and it will be implemented through a web extension that will only run on Facebook. Considering that there’s a lot of various ways on identifying fake news, this document will be providing the characteristics of fake news and how accurate is the SVM algorithm in identifying fake news.

KEYWORDS: Fake news, SVM, classification

# 

# Introduction

## **Project Context**

Fake news is a deliberate misinformation or hoax that spreads via traditional print, broadcast news media or online social media (Novotny, 2017). It misleads people and make the world less informed. It harms the community and the industry in an alarming level (Stecula, n.d.).

Eric Trump, the son of Donald Trump, tweeted an article about paid protestors from the domain “abcnews.com.co” that reinforced right wing conspiracy theories. The article was completely fabricated, but it resembled the real ABC News enough to fool those who weren’t paying attention (Palmisano, 2016). With the way on how fake news is spreading, it would be ideal to have application that help identify fake news online.

## **Purpose and Description**

The main purpose of this project is to prevent online users from being tricked by fake news. The proponents will be using Support vector machine algorithm for classifying. SVM is a supervised machine learning algorithm for classification or regression problems where the dataset teaches SVM about the classes so that SVM can classify any new data. It works by classifying the data into different classes by finding a line (hyperplane) which separates the training data set into classes. As there are many such linear hyperplanes, SVM algorithm tries to maximize the distance between the various classes that are involved and this is referred as margin maximization. If the line that maximizes the distance between the classes is identified, the probability to generalize well to unseen data is increased.

## **Objectives**

The objectives of this study are:

1. To create a classification model that determine whether a link leads to a fake news article or not.
2. To create a web extension for Facebook that can identify whether a link clicked by a user leads to a fake news article or not.

## **Scope and Limitations**

The study is about identifying fake news in Facebook. The researchers will use JavaScript and python programming languages to create a web extension for identifying fake news. The gathered datasets will come from three online websites (Kaggle.com, cbcpwebsite.com, Primer.com). The web extension will only work on the latest and upcoming versions Google Chrome and it will not work on any other browsers.

This study is only limited on identifying fake news in Facebook and will not cover any microblogging sites. The researchers will not use any classifier algorithm other than SVM.

# Review of Related Literature

In this chapter, the researchers will be presenting an articles and related readings about this study. Moreover, this chapter suggests about fake news, web extension or plugin and support vector machines (SVM). Furthermore, this chapter will also inform that the researchers aims to create a web extension for Facebook that will scan the user’s news feed for fake news.

The researchers had read about the article on Pubmed. The researchers Rey et al. (2012) developed an open-source web browser extension to integrate electronic health record (EHR) features in biomedical literature retrieval approaches. Users can use CDAPubMed to load patient clinical documents and identify relevant terms for scientific literature. Which advanced users can optimize to adapt to each specific situation, and generate and launch literature search queries to a major search engine, example: PubMed, to retrieve citations related to the EHR under examination (Re y et al., 2012).

Rey et al. (2012), Developed a web browser extension named CDAPubmed, providing a natural and configurable tool to enhance PubMed results based on patient features. The tool will provide new possibilities to identify relevant retrieval terms within more structured documents. Using the tool, users can select relevant keywords. Each keyword would retrieve if added to the query, is displayed next to each relevant term to facilitate keyword selection. The researchers, Rey et al. (2012 ) used this tool to help them to their study on web extension that will apply to integrate (EHR). This article is not exactly about fake news but still it will help researchers to know more about web extensions.

According to Conroy et al. (2015), classifiers are useful for automated numerical analysis. One common example of classifiers is Support Vector Machines (SVM). It shown high accuracy results in classification. It provides a basis for the design of a comprehensive fake news detection tool. Using classifier the accuracy which measures the number of articles correctly classified as real or fake.

The researchers will conclude that these articles will help them to learn more about web browser extensions and SVMs that will apply to the study about identifying fake news in Facebook using web extension.

# Technical Background

**Support Vector Machine**

Support vector machine are good at solving problems. It is used computational biology due to their high accuracy, the ability to deal with large datasets, and the flexibility in modeling different sources of data. These are controlled learning models used for analyzing data and for its classification and regression analysis using sorting algorithms. Support vector machines use its ability to create forecasts based of the given set of data (Ben-Hur et al., 2008). It is also used for specific tasks such as classification of data and analysis. SVM used for sentiment analysis of opinion mining is directly focused on two things: classifying and forecasting. The support vector machine will be able to identify new inputs to the model and then designate each input to its rightful category just as how it processes previous ones. The application of SVM ranges from text categorization, image segmentation, hand-written character recognition (Jadav et al., 2016). The researchers will use SVM to identify fake news and real news in Facebook and it will prove its accuracy.

# Design and Methodology

A web extension is a plug-in that extends the functionality of a web browser. The researchers will create a web extension that can identify fake news and will only run if the link is clicked in Facebook. When the link is clicked, the system will compare the fake news link from the list of fake news links gathered by the team. The data will be gathered from kaggle.com, CBCP(Catholic Bishops' Conference of the Philippines ) and Primer.com . If the link is not in the list, the system then will get the data from the link to compare the following:

* **author**: author of story
* **title**: title of story
* **site\_url** : link
* **likes**: number of Facebook likes
* **comments**: number of Facebook comments
* **shares**: number of Facebook shares

If the author is unknown the system will automatically flagged it as fake. If the link is confirmed fake the system will notify the user with a dialog box popped up, but if the link article is authentic the system will also notify the user.

The extension will be developed using HTML, CSS and JavaScript and it will be compatible to Google Chrome.

# Results and Discussions

# Conclusions and Recommendation

Fake news can be lessened or better yet eliminated, since people keep falling prey for such posts; it needs to be stopped. This paper is meant to do just that; the program we are proposing is meant to detect if the news posted in your social media websites, which would literally get marked as a fake if it is one. To identify a fake news one must check the author, URL, title, number of likes, number of shares and number of comments. This program will be a plugin for the users’ internet browsers, but will only work for Facebook, and will not detect if posted news are fake from other websites. If this program could be implemented, there will definitely be a big change in how news would be spread, since users will no longer fall for faulty news articles and posts.

The researchers will use SVM algorithm for classifying whether the news is fake or not. SVM uses a technique called the kernel trick to transform the data and then based on these transformations it finds an optimal boundary between the possible outputs. Simply put, it does some extremely complex data transformations, then figures out how to separate your data based on the labels or outputs you've defined. What differentiates it from other classifier is that SVM focus only on the points that are the most difficult to tell apart, whereas other classifiers pay attention to all of the points.

# Appendices

The steps to perform data classification using Support Vector Machine algorithm are as

follows:

Step1: Define a set of n data points in an array say

X= array([[x11, x21], [x12, x22], ....... [x1n, x2n]])

Step2: Define class of each data point in a vector of list type say Y = [-1, -1, -1 .....1, 1, 1]

Step3: **F**it the SVM model using the statements

clf = svm.SVC(kernel='linear') and clf.fit(X, Y)

Step4: Get the separating hyperplane xx as x1 coordinates anf yy as x2 coordinates

w = clf.coef\_[0]

a = -w[0]/w[1]

xx = np.linspace(-1, 8, 10, 1)

yy = a\*xx - (clf.intercept\_[0])/w[1]

Step5: Get the parallels to the separating hyperplane that pass through the support vectors

b = clf.support\_vectors\_[0]

yy\_down = a\*xx + (b[1] - a\*b[0]) (positive support plane)

b = clf.support\_vectors\_[-1]

yy\_up = a\*xx + (b[1] - a\*b[0]) (negative support plane)

Step6: Plot the line, the points, and the nearest vectors to the plane using appropriate python commands

# References

Eugene Kiely, L. R. (2016, November 18). *FactCheck.org*. Retrieved from http://www.factcheck.org/2016/11/how-to-spot-fake-news/

*Machine Learning 101*. (n.d.). Retrieved from Medium: https://medium.com/machine-learning-101/chapter-2-svm-support-vector-machine-theory-f0812effc72

Media Insight Project. (2016, March 17). *American Express Institute.* Retrieved from https://www.americanpressinstitute.org/publications/reports/survey-research/trust-news/

Novotny, E. (2017, August 1). *PennState*. Retrieved from libraries.

Palmisano, S. (2016, December 29). *EagleNews*. Retrieved from eaglenews: http://eaglenews.org/opinion/fake-news-leads-to-real-problems/

*Rappler*. (2017, April 10). Retrieved from http://www.rappler.com/technology/social-media/166326-how-to-spot-fake-news-facebook

Sathyanarayana, S. V. (n.d.). Data classification using Support vector. *Data classification using Support vector*.

Stecula, D. (n.d.). *The conversation*. Retrieved from theconversation: http://theconversation.com/the-real-consequences-of-fake-news-81179

*Wikipidea*. (n.d.). Retrieved from https://en.wikipedia.org/wiki/Fake\_news

Rey et al. (2012). *PubMed*. Retrieved from Article: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3366875/

# Chi-Hsin, Huang et al (2009) PubMed search with text mining features. Retrieved from: https://academic.oup.com/bioinformatics/article-lookup/doi/10.1093/bioinformatics/btp475