EARLY DETECTION OF SINHALA LANGUAGE FAKE NEWS IN SOCIAL MEDIA NETWORKS

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Degree of Master of Science by Research

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Declaration

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The above candidate has carried out research for the Masters Dissertation under my supervision.

Name of the Supervisor: Dr. Supunmali Ahangama and Dr. Shalinda Adikari

Signature of the supervisor: Date: 09/04/2024

Abstract

With human evolution, people invented new technologies to make life easier. In the early twentieth century, people read newspapers, listened to radio, and watched television to gather information. With the refinement of technologies, tech people introduced social media platforms to connect with people. Busy modern people started to browse and rely on these platforms to gather news while losing interest in traditional platforms. Social media is easy to access and cost-effective. These platforms can be effortlessly used for propagating fake news content and misleading people for personal, political, or religious benefits. Society must have a proper mechanism to avoid the spread of false information. The knowledge of human experts can be used to overcome the issue by manually investigating news content. However, it requires many human experts, and it consumes time. The study introduced an automated system to detect Sinhala fake news published on social media when the content is published. The data set was created by gathering news from Facebook, which was proven fake by Sri Lankan fact-checkers or legitimate by Sri Lankan news broadcasting channels. The proposed method considered content-related features with deep learning and machine learning techniques. The deep learning model was implemented by extracting Sinhala POS tags and their TF-IDF values combined with XLM-R embeddings. The introduced deep learning approach achieved 86% accuracy. The machine learning approach used TF-IDF values of Sinhala POS tags, FastText embeddings, and punctuation count. The proposed machine learning approach achieved 85% accuracy. The proposed methods can identify fake news early, preventing its spread. The performance can be further enhanced by increasing the dataset size by collecting more data.

Keywords – Sinhala fake news, social media, content-related features, natural language processing (NLP), deep learning (DL), machine learning (ML)

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LIST OF ABBREVIATIONS

Abbreviation	Description
POS	Part-Of-Speech
TF-IDF	Term Frequency - Inverse Document Frequency
XLM	Cross-Lingual Language Model
NLP	Natural Language Processing
DL	Deep Learning
URL	Uniform Resource Locators
NCV	Noun in Compound Verbs
NIP	Nipathana
NNJ	Adjectival Noun
PRP	Pronoun
ROC	Receiver Operating Characteristic
SOV	Subject, Object, Verb
OS	Operating System
ML	Machine Learning
CNN	Convolutional Neural Network
RNN	Recurrent Neural Network
LSTM	Long Short-Term Memory
BERT	Bidirectional Encoder Representations from Transformers
GRU	Gated Recurrent Unit
SVM	Support Vector Machine
NER	Named Entity Recognition
ZSL	Zero-Shot Learning
AI	Artificial Intelligence
LLM	Large Language Model