THE REPUBLIC OF INDONESIA DEFENSE UNIVERSITY

SENTIMENT ANALYSIS MODEL USING BI-LSTM AND LATENT DIRICHLET ALLOCATION ON YOUTUBE COMMENTS TO SUPPORT INTELLIGENCE DATA

AGUNG NUGROHO
120220405003

This Thesis was Written for the Fulfillment of the Requirement
to Earn Master's Degree in Defense Science

SCIENCE AND DEFENSE TECHNOLOGY FACULTY
CYBER DEFENSE ENGINEERING STUDY PROGRAM

BOGOR
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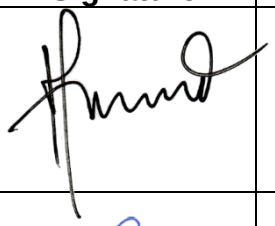
1.	Advisor I: Dr. Ir. H. Achmad Farid Wadjdi, M.M.		26/01/2024
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DECLARATION OF ORIGINALITY

I hereby declare that in this thesis there is no work or part of work that has been given to obtain a bachelor's degree at any level at a university; and to the best of my knowledge, no term, phrase, sentence, paragraph, subchapter or chapter of any work has ever been written or published; except as written in this text and mentioned in the Reference List.

If in the future it is proven that there is plagiarism in this thesis, I am willing to accept sanctions in accordance with the provisions of the applicable regulations/laws.

Bogor, January , 2024

Agung Nugroho

FOREWORDS

I would like to thank the presence of Allah SWT, the completion of the preparation of the thesis entitled Sentiment Analysis Model using Bi-LSTM and Latent Dirichlet Allocation on YouTube Comments to Support Intelligence Data can be complete.

The preparation of this thesis is intended as one of the requirements for obtaining a Master's degree in the Cyber Defense Engineering Study Program, Faculty of Science and Defense Technology, The Republic of Indonesia Defense University.

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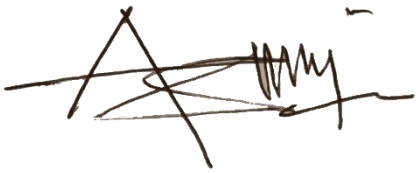
May Allah SWT repay the kindness of various parties for their assistance.

The researcher realizes that this thesis is still imperfect, therefore the researcher humbly hopes for constructive criticism and suggestions to support the perfection of this research.

Finally, we hope that this thesis can provide benefits to the development of defense science and be useful for stakeholders in efforts to improve national security and defense in the cyber sector.

Bogor, January , 2024



Agung Nugroho

ABSTRACT

SENTIMENT ANALYSIS MODEL USING BI-LSTM AND LATENT DIRICHLET ALLOCATION ON YOUTUBE COMMENTS TO SUPPORT INTELLIGENCE DATA

AGUNG NUGROHO

YouTube has the potential to become a propaganda medium that can disrupt national security stability. So comments on YouTube videos can be used as a medium for assessing public opinion which is formed from acts of propaganda. The presence of Artificial Intelligence technology makes it easier to assess public opinion but is hampered by accuracy and datasets. This research proposes modeling using Bi-Directional Long Short-Term Memory (Bi-LSTM) and Latent Dirichlet Allocation (LDA) using quantitative methods to assess sentiment categories and topics from comments on YouTube videos. This research aims to design a model that is novel in the form of combining a sentiment analysis model with the addition of topic category output to support intelligence data collection on social media. The research results show that the Bi-LSTM model with Word2Vec has the highest performance compared to other models, such as Logistic Regression (LR), Multinomial Naïve Bayes (MNB), K-Nearest Neighbors (KNN), and Random Forest (RF), with an average value -average accuracy, precision, recall and F1-Score reaches 98%. The results of this research contribute to the assessment of public opinion and categorization of topics currently being widely discussed by the public on YouTube as an open source of intelligence information to support defense strategies.

Keywords: Bi-LSTM, Deep Learning, LDA, Pancagatra, Youtube

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LIST OF ABBREVIATIONS

AI	: Artificial Intelligence
Bi-LSTM	: Bidirectional Long Short-Term Memory
CBOW	: Continous Bag of Word
DT	: Decision Trees
Ipoleksosbudhankam	: Ideology, Politics, Economics, Socio-Culture, Defense and Security
Kemhan RI	: Ministry of Defense of the Republic of Indonesia
KNN	: k-Nearest Neighbors
LDA	: Latent Dirichlet Allocation
LR	: Logistic Regression
MNB	: Multinomial Naïve Bayes
NLP	: Natural Language Processing
OSINT	: Open Source Intelligence
RF	: Random Forest