CYBERBULLYING DETECTION AND ANALYSIS USING MACHINE LEARNING

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Abstract. Increased online use and allowing users to engage with groups such as digital networking have contributed to the growth of hacking. Online abuse is a new type of harassment that has lately become more prevalent as online communities have grown in popularity. It tends to send messages which included defamatory claims or vocally harassing someone while in the internet group. Only if modern civilization recognizes harassment as it truly is, countless of hidden sufferers may continue to suffer. There have been several studies on cyberbullying, but none of them have been able to offer a solid remedy. By creating a model that can recognize and block bullying-related incoming and outgoing communications, we address this issue in our project. By employing supervised classification techniques on an opensource dataset that has been carefully annotated, we hope to provide lexical baselines for this job. We used machine learning algorithm of logistic regression. Our model classifies a message whether its bullying or not.

1 INTRODUCTION

A collection of Web 2.0-based program's called social media make it possible to create and share user-generated content. These are all Internet-based applications. People may take use of social media to gain access to a wealth of knowledge, easy communication, etc. Cyberbullying is the term used to describe aggressive, deliberate acts committed by a person or group of individuals against a victim using digital communication channels like sending messages and leaving comments online.

Speech that is intended to stir up hatred for a specific group—a community, a religion, or a race—is referred to as hate speech. These assertions could or might not be true, but it is probable that they will result in violence. Worldwide increases in violence against minorities, such as lynchings, mass shootings, and ethnic cleansing, have been connected to hate speech on the Internet.

Hate speech is also rapidly rising. Online abuse on media platforms seems to be on the rise, and it has detrimental effects on the millennial population. have prompted an upsurge in study into the detection of cyberbullying in recent years. Automated methods of cyberbullying detection are being studied more and more. These methods match text data with the indicated criteria to automatically detect cyberbullying. They do this by identifying the aspects of a cyberbullying exchange and using natural language processing techniques to analyse the content.

Simple word filters do not adequately address this issue, necessitating natural language processing that focuses on this symptom: What constitutes hate speech can be influenced by factors. The model is trained using the Tweeter dataset from Kaggle. We must initially use a single categorization algorithm to move further with these datasets. We utilized the 0-1 predictor to determine if the text contains cyberbullying material or not. This creates a binary space in which we can train our model and exclude out any grey possibilities. In order to properly classify data, it must first be cleaned of symbols, spacy tokenizer Addresses, mails, line breaks, spaces, digits, commas, separating, and individual characters. 1 Together with an incisive analysis of some published research on methods for detecting cyberbullying, this study offers a thorough and organized overview of robotic incitement identification and examines a few of the existing methodologies.

2 LITERATURE SURVEY

G. A. León-Paredes et al. [6] elaborated how Native Terms in educational (NLP) and Mechanical Interpretation are utilized to construct a cyber abuse recognition algorithm (ML). Cyberbullying Mitigation in Spanish the ml techniques Naive Bayes, SVM Classifiers, and Linear Regression were implemented to create

the platform (SPC). This original study dataset was made public on Twitter. Using e-ISSN: 2582-5208, nearly 93% reliability was attained. Global publishing in the Technology, Innovation, and Research Volume:04/Issue:05/May-2022 6.752 Impact Factor www.irjmets.com Global Journal Article of Modification in Bioengineering, Tech, and Science [4528] is available online at www.irjmets.com. the employment of methods with private citizens' assistance. This device's efficiency ranged from 80% to 91% on average when it came to allegations of internet victimization. NLP approaches for filtering and inflectional can be utilized to constantly improve precision. When applicable, a similar paradigm can be utilized for uptake in both English and regional tongues.

P. K. Roy, et al. [7] information on how to post a petition of bigotry on Facebook using an assistance from a deep neural convolutional network. With the help of machine learning algorithms, tweets containing hate speech have been found Utilizing the procedure, functionalities on Facebook have now been removed. The best ml model is SVM, however in a 4:1 sample used to evaluate trained predictions, it was capable of forecasting 53% of racial hatred messages.

Uneven data were the cause of the low predicted scale. The technique relies on the forecasting of tweets that include hate speech. Neural Network, short-term memory, and their Content LSTM mixtures are enhanced techniques that provide results similar to those of an independent Hadoop cluster. After you have a very excellent rate of memory, 10 times cross confirmation was utilised in conjunction with the suggested DCNN model. The ratio of hate speech to non-hate speech was 0.88 to 0.99. The k-fold opposite verification technique offers a superior resolution with uneven data, according to test findings. The present dataset could be increased in the future for higher efficiency correctness.

R. R. Dalvi, et al. [3] proposes the process for achieving them identify & stop digital abuse controlled ml techniques employing identified on Facebook. Inside this experiment, texts and sample sizes are compiled using the real time Api. The suggested model evaluates SVM and Bayesian Network on the gathered data sets. Use the TFIDF vectorizer to delete a feature. The findings demonstrate the accuracy of a model for internet abuse constructed using Vector Assist. In comparison to Naïve Bayes classifier, the computer performs around 73.34% superior.

N. Tsapatsoulis, et al. [5] comprehensive analysis in newly implemented harassment on Facebook. Moreover, The significance of recognizing the numerous Facebook offenders is discussed. According to the Research report, there are a number of concrete measures that must be taken in order to construct a useful and successful software for detecting Online activity. I use characteristic types, ml models, and knowledge categorization and data logging.

Title	Journal/Conference	Authors	Year	Identified Limitations
"Automated Detection of Cyberbullying in Social Media Platforms"	Journal of Artificial Intelligence Research	Wang H., Li Z.	2021	Difficulty in detecting context-specific cases and irony.
"Automated Detection of Cyberbullying in Social Media Platforms"	International Journal of Computer Applications	Patel A., Singh R.	2020	Requires large annotated datasets; computationally intensive.
"Natural Language Processing Techniques for Cyberbullying Detection"	IEEE Transactions on Computational Social Systems	Zhang X, Kim Y	2019	Challenges in understanding sarcasm and evolving slang.

"Challenges and Opportunities in Cyberbullying Detection Using Machine Learning"	ACM Computing Surveys	Chen L., Nguyen H.	2022	Limited cross-cultural and multilingual effectiveness.
"Towards Real-Time Cyberbullying Detection: A Survey"	International Journal of Data Science	Jackson P., Wilson T.	2021	High false-positive rates and real-time processing issues.

2.1 Summary

The Cyberbullying Detection and Analysis mini project aims to develop a system that can effectively detect and analyze cyberbullying behavior from textual data. The system identifies harmful language, abusive content, and online harassment patterns within social media posts, messages, or comments. The first step involves data collection, where a dataset containing labelled instances of both bullying and non-bullying content is gathered from social media platforms or publicly available sources. Following this, data preprocessing is conducted, which includes cleaning the text by removing unnecessary characters, tokenizing sentences into meaningful words, eliminating stopwords, and applying techniques such as stemming or lemmatization to reduce words to their root forms. Feature extraction then converts the processed data into meaningful features that can be fed into machine learning models for further analysis. Finally, machine learning techniques like Support Vector Machines (SVM), Random Forest, or neural networks are used to train the model for classifying cyberbullying content. Once the system is built, it can provide valuable insights by analyzing the frequency, nature, and impact of cyberbullying across platforms, helping organizations or authorities address online harassment more effectively.

3 METHODOLOGY

3.1 ML

Without being expressly designed, ml algorithms may acquire data and utilize it to learn on their own. So how exactly does the ml method operate? just by looking at the numbers.

3.2 Logistic Regression

A machine learning technique for addressing categorization issues is logistical regression. It is a probability-based methodology of predictive analysis. The classification procedure of a binary number is used as the dependent variable in logistic regression. Establishing a connection between qualities and the similarities of a particular event is the goal of regression model. As example, based on the amount of time spent analysing, the data set may be used to predict whether a child will succeed or not in a test. Many individuals are unclear about whether logistic regression falls under the classification or regression categories. Linear methods cannot perfectly depict it since it may have a value more than One or a little less than zero, which is unlikely depending on the regression analysis.

The link between the goal both the unbiased as well as the controlled variables in a data set is examined using regression analysis, a predictive modelling approach. When there is a linear or nonlinear connection Logistic analysis methods are used when there is a relationship in between target attribute and the explanatory variables and the specific value has numeric attributes. Finding the best fitted model, or the vector which has the smallest distance among each sampling site and traverses all of those, is the aim of logistical regression. Logistical regression is 1 among the techniques utilized in logistic regression whenever the parameter is continuous.

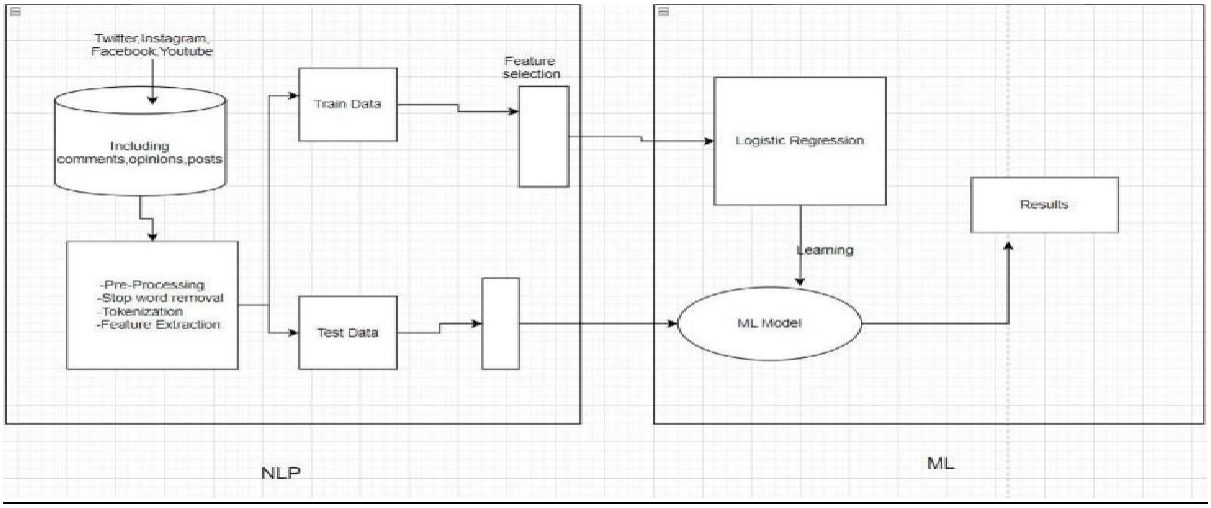
For instance, either false or true, 0 or 1, etc. The target variable may only take on two values as a result, and a sigmoid curve illustrates a correlation seen between uncontrolled and goal parameters by converting each true answer to something like a solution among zero & one. We have selected the logit model due to the size of this data analysis and the nearly identical occurrence of the objective continuous variables. Also, the survey set's uncontrolled variables did not show any correlation with one another. This sklearn.linear curve package was used to create the classifier.

- This linear curve graph illustrates the likelihood of a certain outcome, including if malignant cells are present or not, or if the mouse was fat or just not depending on its mass, etc.

3.3 Logistical Function/Sigmoid Function

- A mathematical formula called the sigmoid method is utilised to convert parameter estimates into percentages.
- This converts every true figure together into different number between zero and one.
- This same sigmoid regression's result must fall within the range of zero and one and can't go beyond it, resulting in an S-shaped curve".

3.4 System Design



3.5 Implementation

- Installing relevant packages
- Importing
- Loading data
- Visualization
- Preprocessing
- Training and calculating scores
- Normal methods
- Ensemble methods

3.6 Installing Relevant Packages

Begin by ensuring that your environment has the necessary libraries. Commonly used packages include:

pandas: For data manipulation and analysis.
numpy: For numerical operations, especially with arrays. scikit-learn: For implementing machine learning algorithms. matplotlib and seaborn: For data visualization.

3.7 Importing

After installation, you need to import these libraries into your script or notebook. For example:

```
python
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.model_selection import train_test_split from
sklearn.ensemble import RandomForestClassifier
```

3.8 Loading Data

Load your dataset into a manageable format using pandas. You might read from a CSV file, Excel file, or database. For example:

```
python
data = pd.read_csv('data.csv')
```

3.9 Visualization:

Create plots to visualize the data and understand relationships between variables. This can include histograms, scatter plots, box plots, and heatmaps. Example:

```
python
sns.pairplot(data) plt.show()
```

3.10 Proprocessing

Prepare the data for modeling by handling missing values, encoding categorical variables (e.g., using one-hot encoding), and normalizing or standardizing numerical features. For instance:

```
python
data.fillna(method='ffill', inplace=True) # Fill missing values
data = pd.get_dummies(data) # One-hot encode categorical variables
```

3.11 Training And Calculating Scores

Split the data into training and testing sets using train_test_split. Train your model and evaluate its performance using metrics like accuracy, precision, recall, and F1-score. For example:

```
python
X_train, X_test, y_train, y_test = train_test_split(data.drop('target', axis=1), data['target'],
test_size=0.2)
model = RandomForestClassifier() model.fit(X_train, y_train)
predictions = model.predict(X_test)
```

3.12 Normal Methods

Implement standard algorithms like Logistic Regression, Decision Trees, or K-Nearest

Neighbors. Each method has different assumptions and performance characteristics. For example:

```
python
from sklearn.linear_model import LogisticRegression model = LogisticRegression()
model.fit(X_train, y_train)
```

3.13 Ensemble Methods

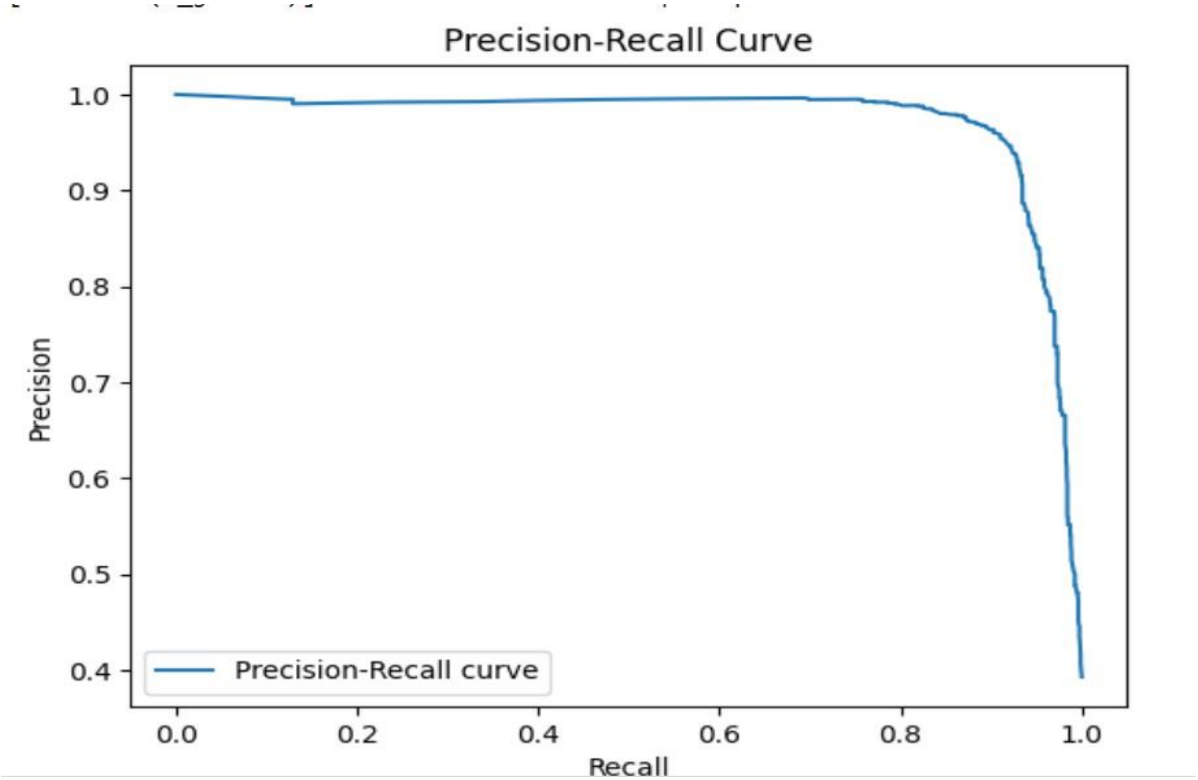
Use advanced techniques like Random Forest, Gradient Boosting, or AdaBoost to improve model performance by combining the predictions of multiple models. These methods can help reduce overfitting and improve accuracy. For example:

```
python
from sklearn.ensemble import RandomForestClassifier
ensemble_model = RandomForestClassifier(n_estimators=100) ensemble_model.fit(X_train,
y_train)
```

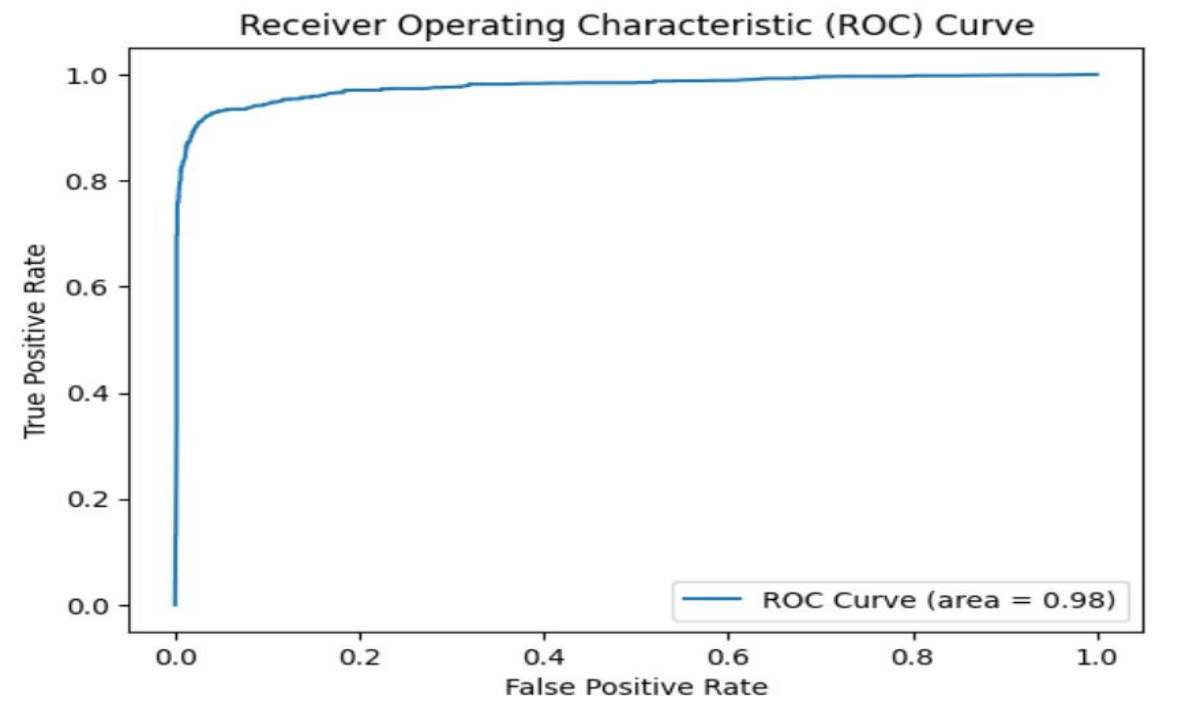
4 RESULT

```
[Parallel(n_jobs=1)]: Done  49 tasks      | elapsed:  3.3min
[Parallel(n_jobs=1)]: Done  49 tasks      | elapsed:    0.6s
Random Forest Classifier Results:
[Parallel(n_jobs=1)]: Done  49 tasks      | elapsed:    0.6s
Accuracy:  0.9117720569857536
Confusion Matrix:
 [[2157  272]
 [  81 1491]]
              precision    recall  f1-score   support

           0       0.96      0.89      0.92      2429
           1       0.85      0.95      0.89      1572

    accuracy                           0.91      4001
   macro avg       0.90      0.92      0.91      4001
weighted avg       0.92      0.91      0.91      4001

[Parallel(n_jobs=1)]: Done  49 tasks      | elapsed:    0.9s
```

4.1 Precision-Recall Curve



4.2 Receiver Operating Characteristic (Roc) Curve



REFERENCES

1. Murthy, G. V. K., Sivanagaraju, S., Satyanarayana, S., & Rao, B. H. (2012). Reliability improvement of radial distribution system with distributed generation. *International Journal of Engineering Science and*

Technology (IJEST), *4*(09), 4003-4011.

2. Gowda, B. M. V., Murthy, G. V. K., Upadhye, A. S., & Raghavan, R. (1996). Serotypes of Escherichia coli from pathological conditions in poultry and their antibiogram.
3. Balasubbareddy, M., Murthy, G. V. K., & Kumar, K. S. (2021). Performance evaluation of different structures of power system stabilizers. *International Journal of Electrical and Computer Engineering (IJECE)*, *11*(1), 114-123.
4. Murthy, G. V. K., & Sivanagaraju, S. (2012). S. Satyana rayana, B. Hanumantha Rao," Voltage stability index of radial distribution networks with distributed generation,". *Int. J. Electr. Eng*, *5*(6), 791-803.
5. Anuja, P. S., Kiran, V. U., Kalavathi, C., Murthy, G. N., & Kumari, G. S. (2015). Design of elliptical patch antenna with single & double U-slot for wireless applications: a comparative approach. *International Journal of Computer Science and Network Security (IJCSNS)*, *15*(2), 60.
6. Murthy, G. V. K., Sivanagaraju, S., Satyanarayana, S., & Rao, B. H. (2015). Voltage stability enhancement of distribution system using network reconfiguration in the presence of DG. *Distributed Generation & Alternative Energy Journal*, *30*(4), 37-54.
7. Reddy, C. N. K., & Murthy, G. V. (2012). Evaluation of Behavioral Security in Cloud Computing. *International Journal of Computer Science and Information Technologies*, *3*(2), 3328-3333.
8. Madhavi, M., & Murthy, G. V. (2020). Role of certifications in improving the quality of Education in Outcome Based Education. *Journal of Engineering Education Transformations*, *33*(Special Issue).
9. Varaprasad Rao, M., Srujan Raju, K., Vishnu Murthy, G., & Kavitha Rani, B. (2020). Configure and management of internet of things. In *Data Engineering and Communication Technology: Proceedings of 3rd ICDECT-2K19* (pp. 163-172). Springer Singapore.
10. Murthy, G. V. K., Suresh, C. H. V., Sowjankumar, K., & Hanumantharao, B. (2019). Impact of distributed generation on unbalanced radial distribution system. *International Journal of Scientific and Technology Research*, *8*(9), 539-542.
11. Baskar, M., Rajagopal, R. D., BVVS, P., Babu, J. C., Bartáková, G. P., & Arulananth, T. S. (2023). Multi-region minutiae depth value-based efficient forged finger print analysis. *Plos one*, *18*(11), e0293249.
12. Mukiri, R. R., & Prasad, D. B. (2019, September). Developing Secure Storage of cloud with IoT Gateway. In *Proceedings of International Conference on Advancements in Computing & Management (ICACM)*.
13. Venkatesh, C., Prasad, B. V. V. S., Khan, M., Babu, J. C., & Dasu, M. V. (2024). An automatic diagnostic model for the detection and classification of cardiovascular diseases based on swarm intelligence technique. *Heliyon*, *10*(3).
14. Ramesh, M., Mandapati, S., Prasad, B. S., & Kumar, B. S. (2021, December). Machine learning based cardiac magnetic resonance imaging (cmri) for cardiac disease detection. In *2021 Second International Conference on Smart Technologies in Computing, Electrical and Electronics (ICSTCEE)* (pp. 1-5). IEEE.
15. Kumar, B. S., Prasad, B. S., & Vyas, S. (2020). Combining the OGA with IDS to improve the detection rate. *Materials Today: Proceedings*.
16. Siva Prasad, B. V. V., Mandapati, S., Kumar Ramasamy, L., Boddu, R., Reddy, P., & Suresh Kumar, B. (2023). Ensemble-based cryptography for soldiers' health monitoring using mobile ad hoc networks. *Automatika: časopis za automatiku, mjerenje, elektroniku, računarstvo i komunikacije*, *64*(3), 658-671.
17. Siva Prasad, B. V. V., Sucharitha, G., Venkatesan, K. G. S., Patnala, T. R., Murari, T., & Karanam, S. R. (2022). Optimisation of the execution time using hadoop-based parallel machine learning on computing clusters. In *Computer Networks, Big Data and IoT: Proceedings of ICCBI 2021* (pp. 233-244). Singapore: Springer Nature Singapore.
18. Prasad, B. V., & Ali, S. S. (2017). Software–defined networking based secure rout-ing in mobile ad hoc network. *International Journal of Engineering & Technology*, *7*(1.2), 229.
19. Elechi, P., & Onu, K. E. (2022). Unmanned Aerial Vehicle Cellular Communication Operating in Non-terrestrial Networks. In *Unmanned Aerial Vehicle Cellular Communications* (pp. 225-251). Cham: Springer International Publishing.
20. Prasad, B. V. V. S., Mandapati, S., Haritha, B., & Begum, M. J. (2020, August). Enhanced Security for the authentication of Digital Signature from the key generated by the CSTRNG method. In *2020 Third International Conference on Smart Systems and Inventive Technology (ICSSIT)* (pp. 1088-1093). IEEE.
21. Balram, G., Anitha, S., & Deshmukh, A. (2020, December). Utilization of renewable energy sources in generation and distribution optimization. In *IOP Conference Series: Materials Science and*

Engineering (Vol. 981, No. 4, p. 042054). IOP Publishing.

22. Hnamte, V., & Balram, G. (2022). Implementation of Naive Bayes Classifier for Reducing DDoS Attacks in IoT Networks. *Journal of Algebraic Statistics*, *13*(2), 2749-2757.
23. Balram, G., Poornachandrarao, N., Ganesh, D., Nagesh, B., Basi, R. A., & Kumar, M. S. (2024, September). Application of Machine Learning Techniques for Heavy Rainfall Prediction using Satellite Data. In *2024 5th International Conference on Smart Electronics and Communication (ICOSEC)* (pp. 1081-1087). IEEE.
24. Subrahmanyam, V., Sagar, M., Balram, G., Ramana, J. V., Tejaswi, S., & Mohammad, H. P. (2024, May). An Efficient Reliable Data Communication For Unmanned Air Vehicles (UAV) Enabled Industry Internet of Things (IIoT). In *2024 3rd International Conference on Artificial Intelligence For Internet of Things (AIIoT)* (pp. 1-4). IEEE.
25. KATIKA, R., & BALRAM, G. (2013). Video Multicasting Framework for Extended Wireless Mesh Networks Environment. *pp-427-434, IJSRET*, *2*(7).
26. Prasad, P. S., & Rao, S. K. M. (2017). HIASA: Hybrid improved artificial bee colony and simulated annealing based attack detection algorithm in mobile ad-hoc networks (MANETs). *Bonfring International Journal of Industrial Engineering and Management Science*, *7*(2), 01-12.
27. Prasad, P. S., & Rao, S. K. M. (2017). A Survey on Performance Analysis of ManetsUnder Security Attacks. *network*, *6*(7).
28. Reddy, P. R. S., & Ravindranath, K. (2024). Enhancing Secure and Reliable Data Transfer through Robust Integrity. *Journal of Electrical Systems*, *20*(1s), 900-910.
29. REDDY, P. R. S., & RAVINDRANATH, K. (2022). A HYBRID VERIFIED RE-ENCRYPTION INVOLVED PROXY SERVER TO ORGANIZE THE GROUP DYNAMICS: SHARING AND REVOCATION. *Journal of Theoretical and Applied Information Technology*, *100*(13).
30. Reddy, P. R. S., Ram, V. S. S., Greshma, V., & Kumar, K. S. Prediction of Heart Healthiness.
31. Reddy, P. R. S., Reddy, A. M., & Ujwala, B. IDENTITY PRESERVING IN DYNAMIC GROUPS FOR DATA SHARING AND AUDITING IN CLOUD.
32. Kovoor, M., Durairaj, M., Karyakarte, M. S., Hussain, M. Z., Ashraf, M., & Maguluri, L. P. (2024). Sensor-enhanced wearables and automated analytics for injury prevention in sports. *Measurement: Sensors*, *32*, 101054.
33. Rao, N. R., Kovoor, M., Kishor Kumar, G. N., & Parameswari, D. V. L. (2023). Security and privacy in smart farming: challenges and opportunities. *International Journal on Recent and Innovation Trends in Computing and Communication*, *11*(7 S).
34. Madhuri, K. (2023). Security Threats and Detection Mechanisms in Machine Learning. *Handbook of Artificial Intelligence*, 255.
35. Madhuri, K. (2022). A New Level Intrusion Detection System for Node Level Drop Attacks in Wireless Sensor Network. *Journal of Algebraic Statistics*, *13*(1), 159-168.
36. Yakoob, S., Krishna Reddy, V., & Dastagiraiah, C. (2017). Multi User Authentication in Reliable Data Storage in Cloud. In *Computer Communication, Networking and Internet Security: Proceedings of IC3T 2016* (pp. 531-539). Springer Singapore.
37. DASTAGIRAIAH, D. (2024). A SYSTEM FOR ANALYSING CALL DROP DYNAMICS IN THE TELECOM INDUSTRY USING MACHINE LEARNING AND FEATURE SELECTION. *Journal of Theoretical and Applied Information Technology*, *102*(22).
38. Sukhavasi, V., Kulkarni, S., Raghavendran, V., Dastagiraiah, C., Apat, S. K., & Reddy, P. C. S. (2024). Malignancy Detection in Lung and Colon Histopathology Images by Transfer Learning with Class Selective Image Processing.
39. Sudhakar, R. V., Dastagiraiah, C., Pattem, S., & Bhukya, S. (2024). Multi-Objective Reinforcement Learning Based Algorithm for Dynamic Workflow Scheduling in Cloud Computing. *Indonesian Journal of Electrical Engineering and Informatics (IJEEI)*, *12*(3), 640-649.
40. PushpaRani, K., Roja, G., Anusha, R., Dastagiraiah, C., Srilatha, B., & Manjusha, B. (2024, June). Geological Information Extraction from Satellite Imagery Using Deep Learning. In *2024 15th International Conference on Computing Communication and Networking Technologies (ICCCNT)* (pp. 1-7). IEEE.
41. Samya, B., Archana, M., Ramana, T. V., Raju, K. B., & Ramineni, K. (2024, February). Automated Student Assignment Evaluation Based on Information Retrieval and Statistical Techniques. In *Congress on Control, Robotics, and Mechatronics* (pp. 157-167). Singapore: Springer Nature Singapore.
42. Sravan, K., Rao, L. G., Ramineni, K., Rachapalli, A., & Mohmmad, S. (2024). Analyze the Quality of Wine Based on Machine Learning Approach Check for updates. *Data Science and Applications:*

Proceedings of ICDSA 2023, Volume 3, *820*, 351.

43. Chandhar, K., Ramineni, K., Ramakrishna, E., Ramana, T. V., Sandeep, A., & Kalyan, K. (2023, December). Enhancing Crop Yield Prediction in India: A Comparative Analysis of Machine Learning Models. In *2023 3rd International Conference on Smart Generation Computing, Communication and Networking (SMART GENCON)* (pp. 1-4). IEEE.
44. Ramineni, K., Shankar, K., Shabana, Mahender, A., & Mohmmad, S. (2023, June). Detecting of Tree Cutting Sound in the Forest by Machine Learning Intelligence. In *International Conference on Power Engineering and Intelligent Systems (PEIS)* (pp. 303-314). Singapore: Springer Nature Singapore.
45. Sekhar, P. R., & Sujatha, B. (2020, July). A literature review on feature selection using evolutionary algorithms. In *2020 7th International Conference on Smart Structures and Systems (ICSSS)* (pp. 1-8). IEEE.
46. Sekhar, P. R., & Sujatha, B. (2023). Feature extraction and independent subset generation using genetic algorithm for improved classification. *Int. J. Intell. Syst. Appl. Eng*, *11*, 503-512.
47. Sekhar, P. R., & Goud, S. (2024). Collaborative Learning Techniques in Python Programming: A Case Study with CSE Students at Anurag University. *Journal of Engineering Education Transformations*, *38*(Special Issue 1).
48. Pesaramelli, R. S., & Sujatha, B. (2024, March). Principle correlated feature extraction using differential evolution for improved classification. In *AIP Conference Proceedings* (Vol. 2919, No. 1). AIP Publishing.
49. Amarnadh, V., & Moparthi, N. R. (2024). Range control-based class imbalance and optimized granular elastic net regression feature selection for credit risk assessment. *Knowledge and Information Systems*, 1-30.
50. Amarnadh, V., & Akhila, M. (2019, May). RETRACTED: Big Data Analytics in E-Commerce User Interest Patterns. In *Journal of Physics: Conference Series* (Vol. 1228, No. 1, p. 012052). IOP Publishing.
51. Amarnadh, V., & Moparthi, N. (2023). Data Science in Banking Sector: Comprehensive Review of Advanced Learning Methods for Credit Risk Assessment. *International Journal of Computing and Digital Systems*, *14*(1), 1-xx.
52. Rao, K. R., & Amarnadh, V. QoS Support for Cross-Layer Scheduling Algorithm in Wireless Networks.
53. Selvan, M. Arul, and S. Miruna Joe Amali. "RAINFALL DETECTION USING DEEP LEARNING TECHNIQUE." (2024).
54. Selvan, M. Arul. "Fire Management System For Indutrial Safety Applications." (2023).
55. Selvan, M. A. (2023). A PBL REPORT FOR CONTAINMENT ZONE ALERTING APPLICATION.
56. Selvan, M. A. (2023). CONTAINMENT ZONE ALERTING APPLICATION A PROJECT BASED LEARNING REPORT.
57. Selvan, M. A. (2021). Robust Cyber Attack Detection with Support Vector Machines: Tackling Both Established and Novel Threats.
58. Selvan, M. A. (2023). INDUSTRY-SPECIFIC INTELLIGENT FIRE MANAGEMENT SYSTEM.
59. Selvan, M. Arul. "PHISHING CONTENT CLASSIFICATION USING DYNAMIC WEIGHTING AND GENETIC RANKING OPTIMIZATION ALGORITHM." (2024).
60. Selvan, M. Arul. "Innovative Approaches in Cardiovascular Disease Prediction Through Machine Learning Optimization." (2024).
61. FELIX, ARUL SELVAN M. Mr D., and XAVIER DHAS Mr S. KALAIVANAN. "Averting Eavesdrop Intrusion in Industrial Wireless Sensor Networks."
62. Raj, R. S., & Raju, G. P. (2014, December). An approach for optimization of resource management in Hadoop. In *International Conference on Computing and Communication Technologies* (pp. 1-5). IEEE.
63. Reddy, P. R. S., Bhoga, U., Reddy, A. M., & Rao, P. R. (2017). OER: Open Educational Resources for Effective Content Management and Delivery. *Journal of Engineering Education Transformations*, *30*(3).
64. Reddy, A. V. B., & Ujwala, B. Answering Xml Query Using Tree Based Association Rules.
65. Reddy, P. R. S., Reddy, A. M., & Ujwala, B. IDENTITY PRESERVING IN DYNAMIC GROUPS FOR DATA SHARING AND AUDITING IN CLOUD.
66. Khadse, S. P., & Ingle, S. D. (2011, February). Hydrogeological framework and estimation of aquifer hydraulic parameters using geoelectrical data in the Bhuleshwari river basin, Amravati District, Maharashtra. In *National Conference on Geology and Mineral Resources of India, Aurangabad* (pp. 11-12).

67. Ingle, S. D. Monitoring and Modeling Approaches for Evaluating Managed Aquifer Recharge (MAR) Performance.
68. Kumar, T. V. (2024). A Comparison of SQL and NO-SQL Database Management Systems for Unstructured Data.
69. Kumar, T. V. (2024). A Comprehensive Empirical Study Determining Practitioners' Views on Docker Development Difficulties: Stack Overflow Analysis.
70. Tambi, V. K., & Singh, N. Evaluation of Web Services using Various Metrics for Mobile Environments and Multimedia Conferences based on SOAP and REST Principles.
71. Kumar, T. V. (2024). Developments and Uses of Generative Artificial Intelligence and Present Experimental Data on the Impact on Productivity Applying Artificial Intelligence that is Generative.
72. Kumar, T. V. (2024). A New Framework and Performance Assessment Method for Distributed Deep Neural NetworkBased Middleware for Cyberattack Detection in the Smart IoT Ecosystem.
73. Sharma, S., & Dutta, N. (2024). Examining ChatGPT's and Other Models' Potential to Improve the Security Environment using Generative AI for Cybersecurity.
74. Tambi, V. K., & Singh, N. Blockchain Technology and Cybersecurity Utilisation in New Smart City Applications.
75. Tambi, V. K., & Singh, N. New Smart City Applications using Blockchain Technology and Cybersecurity Utilisation.
76. Kumar, T. V. (2018). Project Risk Management System Development Based on Industry 4.0 Technology and its Practical Implications.
77. Arora, P., & Bhardwaj, S. Using Knowledge Discovery and Data Mining Techniques in Cloud Computing to Advance Security.
78. Arora, P., & Bhardwaj, S. (2021). Methods for Threat and Risk Assessment and Mitigation to Improve Security in the Automotive Sector. *Methods*, *8*(2).
79. Arora, P., & Bhardwaj, S. A Thorough Examination of Privacy Issues using Self-Service Paradigms in the Cloud Computing Context.
80. Arora, P., & Bhardwaj, S. (2020). Research on Cybersecurity Issues and Solutions for Intelligent Transportation Systems.
81. Arora, P., & Bhardwaj, S. (2019). The Suitability of Different Cybersecurity Services to Stop Smart Home Attacks.
82. Arora, P., & Bhardwaj, S. (2019). Safe and Dependable Intrusion Detection Method Designs Created with Artificial Intelligence Techniques. *machine learning*, *8*(7).
83. Arora, Pankit, and Sachin Bhardwaj. "A Very Effective and Safe Method for Preserving Privacy in Cloud Data Storage Settings."
84. Arora, P., & Bhardwaj, S. (2017). A Very Safe and Effective Way to Protect Privacy in Cloud Data Storage Configurations.
85. Arora, P., & Bhardwaj, S. The Applicability of Various Cybersecurity Services to Prevent Attacks on Smart Homes.
86. Arora, P., & Bhardwaj, S. Designs for Secure and Reliable Intrusion Detection Systems using Artificial Intelligence Techniques.
87. Khan, A. (2020). Formulation and Evaluation of Flurbiprofen Solid Dispersions using Novel Carriers for Enhancement of Solubility. *Asian Journal of Pharmaceutics (AJP)*, *14*(03).
88. Jindal, S., Singh, M., & Chauhan, J. (2024). Effect and Optimization of Welding Parameters and Flux Baking on Weld Bead Properties and Tensile Strength in Submerged Arc Welding of HSLA 100 Steel. *Transactions of the Indian Institute of Metals*, *77*(3), 747-766.
89. Chauhan, M. J. (2017). Optimization Of Parameters For Gas Metal Arc Welding Of Mild Steel Using Taguchi's.
90. Singh, S., Kumar, M., Singh, J., Meena, M. L., Dangayach, G. S., & Shukla, D. K. (2023). Investigating the Influence of ASAW Process Parameters on Chemical Composition, Mechanical Properties and Corrosion Rate of HSLA Steel Weldments. *Transactions of the Indian Institute of Metals*, *76*(10), 2791-2806.
91. Monika, J. C. A REVIEW PAPER ON GAS METAL ARC WELDING (GMAW) OF MILD STEEL 1018 BY USING TAGUCHI. *Carbon*, *100*, 0-14.
92. Sharma, S., & Dutta, N. A Large-Scale Empirical Study Identifying Practitioners' Perspectives on Challenges in Docker Development: Analysis using Stack Overflow.
93. Sharma, S., & Dutta, N. (2024). Examining ChatGPT's and Other Models' Potential to Improve the

Security Environment using Generative AI for Cybersecurity.

94. Sharma, S., & Dutta, N. Assessment of Web Services based on SOAP and REST Principles using Different Metrics for Mobile Environment and Multimedia Conference.
95. Sharma, S., & Dutta, N. Design and Implementation of a Pattern-based J2EE Application Development Environment.
96. Sharma, S., & Dutta, N. Evaluation of Potential REST Web Service Description for Graph-based Service Discovery Focused on Hypermedia.
97. Sharma, S., & Dutta, N. A Comparative Exploration of Unstructured Data with SQL and NO-SQL Database Management Systems.
98. Sharma, S., & Dutta, N. Examination of Anomaly Process Detection Using Negative Selection Algorithm and Classification Techniques.
99. Sharma, S., & Dutta, N. Utilization of Blockchain Technology with Cybersecurity in Emerging Smart City Applications.
100. Sharma, S., & Dutta, N. Practical Implications and Development of Project Risk Management Framework based on Industry 4.0 Technologies.
101. Sharma, S., & Dutta, N. Design and Development of Project Risk Management System using Industry 4.0 Technology and Its Practical Implications.
102. Davuluri, S. K., Alvi, S. A. M., Aeri, M., Agarwal, A., Serajuddin, M., & Hasan, Z. (2023, April). A Security Model for Perceptive 5G-Powered BC IoT Associated Deep Learning. In *2023 International Conference on Inventive Computation Technologies (ICICT)* (pp. 118-125). IEEE.
103. Rathod, C. H. A. N. D. A. R., & Reddy, G. K. (2016). Experimental investigation of angular distortion and transverse shrinkage in CO2 arc welding process. *International Journal of Mechanical Engineering*, *5*, 21-28.
104. Rao, G. V., Reddy, G. K., Jagadish Babu, G., & Rao, V. V. S. (2012). Prediction of thermal post buckling and deduction of large amplitude vibration behavior of spring–hinged beams. *Forschung im Ingenieurwesen*, *76*, 51-58.
105. Reddy, E. J., Reddy, G. K., & Rajendra, D. (2021). Design of lifting tackle for armor plate of sinter machine. *International Journal on Technical and Physical Problems of Engineering*, *13*, 23-28.
106. Reddy, G. K., & Sravanthhi, B. (2019). Design and analysis of a propeller blade used for marine engine. *International Journal of Scientific Research in Science, Engineering and Technology*, *6*(1), 440-445.
107. Reddy, H., Reddy, G., Phanindra, G., & Kumar, K. (2018). Design and Analysis of Condenser Using 3D Modelling Software. *International Journal of Research in Engineering and Technology*, *7*, 2319-1168.
108. Reddy, E. J., & Sridhar, C. N. V., Rangadu VP (2015) Knowledge Based Engineering: Notion, Approaches and Future Trends. *Am J Intell Syst*, *5*, 1-17.
109. Reddy, E. J., & Rangadu, V. P. (2018). Development of knowledge based parametric CAD modeling system for spur gear: An approach. *Alexandria engineering journal*, *57*(4), 3139-3149.
110. Jayakiran Reddy, E., Sridhar, C. N. V., & Pandu Rangadu, V. (2016). Research and development of knowledge based intelligent design system for bearings library construction using solidworks API. In *Intelligent Systems Technologies and Applications: Volume 2* (pp. 311-319). Springer International Publishing.
111. Reddy, E. J., Venkatachalapathi, N., & Rangadu, V. P. (2018). Development of an approach for Knowledge-Based System for CAD modelling. *Materials Today: Proceedings*, *5*(5), 13375-13382.
112. Reddy, E., Kumar, S., Rollings, N., & Chandra, R. (2015). Mobile application for dengue fever monitoring and tracking via GPS: case study for fiji. *arXiv preprint arXiv:1503.00814*.
113. Parthiban, K. G., & Vijayachitra, S. (2015). Spike detection from electroencephalogram signals with aid of hybrid genetic algorithm-particle swarm optimization. *Journal of Medical Imaging and Health Informatics*, *5*(5), 936-944.
114. Mathew, O. C., Dhanapal, R., Visalakshi, P., Parthiban, K. G., & Karthik, S. (2020). Distributed security model for remote healthcare (dsm-rh) services in internet of things environment. *Journal of Medical Imaging and Health Informatics*, *10*(1), 185-193.
115. Parthiban, K. G., Vijayachitra, S., & Dhanapal, R. (2019). Hybrid dragonfly optimization-based artificial neural network for the recognition of epilepsy. *International Journal of Computational Intelligence Systems*, *12*(2), 1261-1269.
116. Bhat, S. (2024). Building Thermal Comforts with Various HVAC Systems and Optimum

Conditions.

117. Bhat, S. Automobile Cabin Pre-Conditioning Method Driven by Environmental Conditions with Multi-Satisfaction Goals.
118. Bhat, S. Thermal Comfort Models' Applicability to Automobile Cabin Environments.
119. Bhat, S. Discovering the Attractiveness of Hydrogen-Fuelled Gas Turbines in Future Energy Systems.
120. Bhat, S. Increasing the Cooling Efficiency of Data Centre Servers with Heat Pipes Based on Liquid Cooling.
121. Bhat, S. Deep Reinforcement Learning for Energy-Efficient Thermal Comfort Control in Smart Buildings.
122. Bhat, S. (2020). Enhancing Data Centre Energy Efficiency with Modelling and Optimisation of End-To-End Cooling.
123. Bhat, S. (2015). Design and Function of a Gas Turbine Range Extender for Hybrid Vehicles.
124. Bhat, S. (2015). Deep Reinforcement Learning for Energy-Saving Thermal Comfort Management in Intelligent Structures.
125. Bhat, S. (2016). Improving Data Centre Energy Efficiency with End-To-End Cooling Modelling and Optimisation.
126. Tayal, S., Upadhyay, A. K., Kumar, D., & Rahi, S. B. (Eds.). (2022). *Emerging low-power semiconductor devices: Applications for future technology nodes*. CRC Press.
127. Kumar, T. V., & Balamurugan, N. B. (2018). Analytical modeling of InSb/AlInSb heterostructure dual gate high electron mobility transistors. *AEU-International Journal of Electronics and Communications*, *94*, 19-25.
128. Karthick, R., Rinoj, B., Kumar, T. V., Prabaharan, A. M., & Selvaprasanth, P. (2019). Automated Health Monitoring System for Premature Fetus. *Asian Journal of Applied Science and Technology (AJAST)(Peer Reviewed Quarterly International Journal) Volume*, *3*, 17-23.
129. Venish Kumar, T., & Balamurugan, N. B. (2020). Three-dimensional analytical modeling for small-geometry AlInSb/AlSb/InSb double-gate high-electron-mobility transistors (DG-HEMTs). *Journal of Computational Electronics*, *19*, 1107-1115.
130. Tejani, A. (2021). Integrating energy-efficient HVAC systems into historical buildings: Challenges and solutions for balancing preservation and modernization. *ESP Journal of Engineering & Technology Advancements*, *1*(1), 83-97.
131. Tejani, A., Yadav, J., Toshniwal, V., & Gajjar, H. (2022). Achieving net-zero energy buildings: The strategic role of HVAC systems in design and implementation. *ESP Journal of Engineering & Technology Advancements*, *2*(1), 39-55.
132. Govindaraj, V. (2024). The Future of Mainframe IDMS: Leveraging Artificial Intelligence for Modernization and Efficiency. *International Journal of Advanced Computer Science & Applications*, *15*(11).
133. Jayasingh, S. K., Mishra, R. K., Swain, S., & Sahoo, A. K. SENTIMENT ANALYSIS TO HANDLE COMPLEX LINGUISTIC STRUCTURES: A REVIEW ON EXISTING METHODOLOGIES.
134. Bandi, M., Masimukku, A. K., Vemula, R., & Vallu, S. (2024). Predictive Analytics in Healthcare: Enhancing Patient Outcomes through Data-Driven Forecasting and Decision-Making. *International Numeric Journal of Machine Learning and Robots*, *8*(8), 1-20.
135. Harinath, D., Bandi, M., Patil, A., Murthy, M. R., & Raju, A. V. S. (2024). Enhanced Data Security and Privacy in IoT devices using Blockchain Technology and Quantum Cryptography. *Journal of Systems Engineering and Electronics (ISSN NO: 1671-1793)*, *34*(6).
136. Harinath, D., Patil, A., Bandi, M., Raju, A. V. S., Murthy, M. R., & Spandana, D. (2024). Smart Farming System–An Efficient technique by Predicting Agriculture Yields Based on Machine Learning. *Technische Sicherheit (Technical Security) Journal*, *24*(5), 82-88.
137. Masimukku, A. K., Bandi, M., Vallu, S., Patil, A., Vasundhara, K. L., & Murthy, M. R. (2025). Innovative Approaches in Diabetes Management: Leveraging Technology for Improved Healthcare Outcomes. *International Meridian Journal*, *7*(7).
138. Harinath, D., Patil, A., Ramadevi, G. R., Bandi, M., Murthy, M. R., & Reddy, K. S. Enhancing Routing Efficiency and Performance in Mobile Ad-Hoc Networks Using Deep Learning Techniques.
139. Thamma, S. R. (2024). A Comprehensive Evaluation and Methodology on Enhancing Computational Efficiency through Accelerated Computing.

140. Thamma, S. R. (2024). An Experimental Analysis of Revolutionizing Banking and Healthcare with Generative AI.
141. Thamma, S. R. (2024). A Case Study on Transforming Legacy Databases Seamless Migration to Snowflake.
142. Vadisetty, R. (2020). Privacy-Preserving Machine Learning Techniques for Data in Multi Cloud Environments. *Corrosion Management ISSN: 1355-5243*, *30*(1), 57-74.
143. Vadisetty, R. (2024, November). Multi Layered Cloud Technologies to achieve Interoperability in AI. In *2024 International Conference on Intelligent Computing and Emerging Communication Technologies (ICEC)* (pp. 1-5). IEEE.
144. Vadisetty, R. (2024, November). The Effects of Cyber Security Attacks on Data Integrity in AI. In *2024 International Conference on Intelligent Computing and Emerging Communication Technologies (ICEC)* (pp. 1-6). IEEE.
145. Vadisetty, R. (2024, November). Efficient Large-Scale Data based on Cloud Framework using Critical Influences on Financial Landscape. In *2024 International Conference on Intelligent Computing and Emerging Communication Technologies (ICEC)* (pp. 1-6). IEEE.
146. Mahalakshmi, A., Goud, N. S., & Murthy, G. V. (2018). A survey on phishing and it's detection techniques based on support vector method (Svm) and software defined networking (sdn). *International Journal of Engineering and Advanced Technology*, *8*(2), 498-503.
147. Swapna Goud, N., & Mathur, A. (2019). A certain investigations on web security threats and phishing website detection techniques. *International Journal of Advanced Science and Technology*, *28*(16), 871-879.
148. Swapna, N. (2017). „Analysis of Machine Learning Algorithms to Protect from Phishing in Web Data Mining". *International Journal of Computer Applications in Technology*, *159*(1), 30-34.
149. SAIPRASANNA, S., GOUD, N. S., & MURTHY, G. V. (2021). ENHANCED RECURRENT CONVOLUTIONAL NEURAL NETWORKS BASED EMAIL PHISHING DETECTION. *Elementary Education Online*, *20*(5), 5970-5970.
150. Balakrishna, G., & Nageshwara Rao, M. (2019). Study report on using IoT agriculture farm monitoring. In *Innovations in Computer Science and Engineering: Proceedings of the Sixth ICICSE 2018* (pp. 483-491). Springer Singapore.
151. Balakrishna, G., & Moparthi, N. R. (2020). Study report on Indian agriculture with IoT. *International Journal of Electrical and Computer Engineering*, *10*(3), 2322.
152. Moparthi, N. R., Balakrishna, G., Chithaluru, P., Kolla, M., & Kumar, M. (2023). An improved energy-efficient cloud-optimized load-balancing for IoT frameworks. *Heliyon*, *9*(11).
153. Balakrishna, G., & Moparthi, N. R. (2019). ESBL: design and implement a cloud integrated framework for IoT load balancing. *International Journal of Computers Communications & Control*, *14*(4), 459-474.
154. Shailaja, K., & Anuradha, B. (2016, December). Effective face recognition using deep learning based linear discriminant classification. In *2016 IEEE international conference on computational intelligence and computing research (ICCIC)* (pp. 1-6). IEEE.
155. Reddy, K. S. S., Manohara, M., Shailaja, K., Revathy, P., Kumar, T. M., & Premalatha, G. (2022). Power management using AI-based IOT systems. *Measurement: Sensors*, *24*, 100551.
156. Swetha, A., & Shailaja, K. (2020). An Effective Approach for Security Attacks Based on Machine Learning Algorithms. In *Advances in Computational Intelligence and Informatics: Proceedings of ICACII 2019* (pp. 293-299). Springer Singapore.
157. Shailaja, K., Vaishnavi, K., Shilpa, P., Naveen, S., & Goud, C. U. Data Augmentation for Medical Image Analysis.
158. Ahmad, S. S., Tejaswi, S., Latha, S. B., Kumari, D. S., Prasad, S. D. V., & Bethu, S. (2023, December). Deep learning based mitosis detection for breast cancer prognosis. In *AIP Conference Proceedings* (Vol. 2938, No. 1). AIP Publishing.
159. Tejaswi, S., Sivaprashanth, J., Bala Krishna, G., Sridevi, M., & Rawat, S. S. (2023, December). Smart Dustbin Using IoT. In *International Conference on Advances in Computational Intelligence and Informatics* (pp. 257-265). Singapore: Springer Nature Singapore.