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Assessing Machine Learning and Deep Learning Applications Across Diverse Domains

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ABSTRACT

Applications in machine learning (ML) and deep learning (DL) are subjected to a comprehensive analysis of their algorithmic principles, mathematical foundations, and performance indicators as part of the theoretical evaluation process. The purpose of this review is to get an understanding of the various machine learning and deep learning models, including their ability for generalization, convergence characteristics, and computational efficiency, as well as knowing their strengths and shortcomings. Through the investigation of theoretical issues such as the bias-variance tradeoff, overfitting, underfitting, and the influence of hyperparameters, researchers have the ability to enhance model designs and training techniques. As an additional benefit, the theoretical analysis offers insight on the robustness and interpretability of models, which in turn guides the development of applications that are more trustworthy and successful in a range of domains, such as computer vision, natural language processing, and predictive analytics.

Keywords: Theoretical Evaluation, Algorithmic Principles, Model Optimization, and Machine Learning.

I. INTRODUCTION

ML and DL, which stand for machine learning and deep learning, respectively, have seen exponential development and integration across a wide range of areas, therefore transforming a variety of sectors, ranging from healthcare to finance. The most important aspect of this change is the presence of complex algorithms and models that are able to discover patterns from enormous volumes of data. These algorithms and models are the driving force behind improvements in areas such as image recognition, natural language processing, and predictive analytics. The fast use of these technologies, on the other hand, calls for a comprehensive theoretical examination to be conducted in order to guarantee their efficiency, dependability, and scalability [1-10].

When conducting a theoretical examination of machine learning and deep learning applications, it is necessary to investigate the mathematical foundations and algorithmic frameworks that serve as the foundation for these models. It entails doing an analysis of basic concepts such as the bias-variance tradeoff, convergence qualities, and the influence that various optimization strategies have on the performance of the model. When researchers and practitioners have a better knowledge of these theoretical features, they are better able to build, apply, and revise models in order to attain optimum performance while reducing concerns such as overfitting and underfitting [11-20].

In addition, theoretical insights are essential for tackling difficulties that are associated with the interpretability and robustness of machine learning and deep learning platforms. In light of the fact that these models are increasingly being used in sensitive and crucial sectors, it is of the utmost importance to guarantee that their choices are both transparent and dependable. It is possible to detect potential weaknesses and limits with the assistance of theoretical assessments, which in turn guides the construction of models that are more resilient and interpretable. This rigorous approach not only improves the practical value of machine learning and deep learning systems, but it also creates confidence in their deployment across a variety of real-world settings [21-25].

II. Work Till dated

The subfields of artificial intelligence (AI) known as machine learning and deep learning are centered on the development of computer programs that are able to acquire knowledge from data. There are many different methods that are included in machine learning, such as supervised learning, unsupervised learning, and reinforcement learning. Each of these methods has its own unique theoretical foundations. On the other hand, unsupervised learning is concerned with discovering hidden structures in unlabeled data, and reinforcement learning is centered on training agents to make sequences of decisions by rewarding them for beneficial actions [25-30]. Supervised learning involves learning a function that maps inputs to outputs based on example input-output pairs.

For the purpose of modeling intricate patterns in data, deep learning, a subfield of machine learning, makes use of neural networks that have multiple layers (hence the designation "deep"). The design of these networks, which was modeled after the human brain, enables them to execute tasks such as voice and picture recognition with an impressive level of precision. There has been a substantial contribution made to the construction of more complex models, such as convolutional neural networks (CNNs) and recurrent neural networks (RNNs) [31-40]. This contribution has been made possible by the fundamental work that Hinton et al. (2006) did on deep belief networks and subsequent developments.

The comprehension of the bias-variance tradeoff is an essential component of theoretical assessment in machine learning and deep learning. One definition of bias is the mistake that occurs when a simplified model is used to approximate a real-world situation, which may be more complicated than the model itself. What is meant by the term "variance" is the degree to which the model is sensitive to changes in the training data. Underfitting occurs when the model is too simplistic to capture the underlying pattern, while overfitting occurs when the model catches noise in the data as if it were a genuine pattern [40-45]. Both of these types of underfitting and overfitting are possible outcomes of high bias and high variance.

In order to reduce the effects of overfitting, regularization strategies are often used. These strategies include dropout, L1 and L2 regularization, and data augmentations. An knowledge of the influence that these methods have on the learning process and the selection of the most suitable approach for a particular issue may be gained via the theoretical study of these strategies.

It is crucial to ensure that models learn successfully from data by ensuring that the convergence features of machine learning and deep learning algorithms are present. Methods of optimization that are based on gradients, such as stochastic gradient descent (SGD) and its derivatives (Adam, RMSprop), are used extensively in order to minimize the loss function when training. Theoretical investigations concentrate on the circumstances under which these optimization algorithms converge to a global or local minimum, the speeds at which they converge, and the influence that hyperparameters have on the performance of these algorithms [45-55].

In order to build training techniques that are more effective, it is essential to have a solid understanding of the topography of the loss function as well as the behavior of optimization algorithms in high-dimensional spaces. Learning rate schedules, momentum, and adjustable learning rates are some of the techniques that have been suggested to improve convergence. These techniques are often based on theoretical insights [55-62].

III. Procedures and procedures

Through the use of a complete analytical framework that incorporates both mathematical analysis and empirical validation, the theoretical assessment of machine learning and deep learning applications is carried out. The following procedures are included according to this framework:

- Mathematical modeling is the process of designing the model architecture, loss function, and optimization method in addition to formulating the learning issue in a mathematical manner.
- The process of analyzing the characteristics of the model and optimization method, including the bias-variance tradeoff, convergence properties, and generalization constraints, is referred to as theoretical analysis.
- The process of conducting experiments to confirm theoretical conclusions via the use of benchmark datasets and established assessment criteria is referred to as empirical validation.
- An evaluation of the interpretability of model choices and an evaluation of the robustness of the model against adversarial assaults and other perturbations are both included in the interpretability and robustness analysis assessment.
- Key metrics for assessing machine learning and deep learning models include accuracy, precision, recall, F1 score, and area under the ROC curve (AUC-ROC) for classification tasks. These metrics are used to evaluate the performance of the models. The mean squared error (MSE) and the R-squared statistic are two examples of metrics that are used for regression tasks. A number of variables, including training time, inference time, and computational complexity, are also taken into consideration when determining the effectiveness of mathematical models.

IV. Analyses of Cases

- Several case studies, including the following, will be investigated in order to provide an illustration of the theoretical assessment framework.
- The evaluation of the influence of various regularization strategies on the performance and resilience of the model is being done in the context of image classification using CNNs.
- Analyzing the convergence qualities of different optimization techniques and the influence they have on language modeling problems is the focus of Natural Language Processing with Recurrent Neural Networks (RNNs).
- Assessing the theoretical underpinnings of reinforcement learning algorithms and their

practical applications in robotic control is the focus of the research project titled "Reinforcement Learning for Robotics."Several case studies, including the following, will be investigated in order to provide an illustration of the theoretical assessment framework.

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V. CONCLUSION

An in-depth comprehension of the mathematical underpinnings, algorithmic principles, and performance characteristics of machine learning and deep learning applications may be obtained via the theoretical examination of these applications. Researchers have the capacity to design models that are more successful and dependable if they investigate several elements, such as the bias-variance tradeoff, convergence qualities, and interpretability features. This rigorous methodology guarantees that machine learning and deep learning technologies will continue to progress, hence promoting innovation across a wide range of fields while simultaneously retaining confidence and dependability in their applications in the real world.

VI.REFERENCES

[1] R. H. Agarwal, S. Degadwala, and D. Vyas, “Predictive Modeling for Thyroid Disease Diagnosis using Machine Learning,” in 2024 International Conference on Inventive Computation Technologies (ICICT), 2024, pp. 227–231. doi: 10.1109/ICICT60155.2024.10544462.

[2] U. Chakraborty, J. Gheewala, S. Degadwala, D. Vyas, and M. Soni, “Safeguarding Authenticity in Text with BERT-Powered Detection of AI-Generated Content,” in 2024 International Conference on Inventive Computation Technologies (ICICT), 2024, pp. 34–37. doi: 10.1109/ICICT60155.2024.10544590.

[3] S. Degadwala, D. Vyas, and M. Soni, “Unveiling Cholera Patterns through Machine Learning Regression for Precise Forecasting,” Proceedings - 2024 5th International Conference on Mobile Computing and Sustainable Informatics, ICMCSI 2024, pp. 39–44, 2024, doi: 10.1109/ICMCSI61536.2024.00012.

[4] V. N. D. Krishnamurthy, S. Degadwala, and D. Vyas, “Predicting Hydrogen Fuel Cell Capacity using Supervised Learning Models,” in 2024 International Conference on Inventive Computation Technologies (ICICT), 2024, pp. 1934–1938. doi: 10.1109/ICICT60155.2024.10544401.

[5] F. Ahamad, D. K. Lobiyal, S. Degadwala, and D. Vyas, “Inspecting and Finding Faults in Railway Tracks using Wireless Sensor Networks,” in 6th International Conference on Inventive Computation Technologies, ICICT 2023 - Proceedings, 2023, pp. 1241–1245. doi: 10.1109/ICICT57646.2023.10134164.

[6] S. Degadwala, S. S. Dave, D. Vyas, N. A. Patel, V. I. Gohil, and K. Rana, “Enhancing Mesothelioma Cancer Diagnosis through Ensemble Learning Techniques,” 3rd International Conference on Innovative Mechanisms for Industry

Applications, ICIMIA 2023 - Proceedings, pp. 628–632, 2023, doi: 10.1109/ICIMIA60377.2023.10425887.

[7] S. Degadwala, R. Upadhyay, S. Upadhyay, S. S. Dave, D. Mahida, and D. Vyas, “Enhancing Fleet Management with ESP8266-based IoT Sensors for Weight and Location Tracking,” 3rd International Conference on Innovative Mechanisms for Industry Applications, ICIMIA 2023 - Proceedings, pp. 13–17, 2023, doi: 10.1109/ICIMIA60377.2023.10425949.

[8] S. Degadwala, R. Upadhyay, S. Upadhyay, M. Soni, D. J. Parikh, and D. Vyas, “DeepTread: Exploring Transfer Learning in Tyre Quality Classification,” International Conference on Sustainable Communication Networks and Application, ICSCNA 2023 - Proceedings, pp. 1448–1453, 2023, doi: 10.1109/ICSCNA58489.2023.10370168.

[9] S. Degadwala, D. Vyas, A. Jadeja, and D. D. Pandya, “Enhancing Prostate Cancer Diagnosis: Leveraging XGBoost for Accurate Classification,” Proceedings of the 2023 2nd International Conference on Augmented Intelligence and Sustainable Systems, ICAISS 2023, pp. 1776–1781, 2023, doi: 10.1109/ICAISS58487.2023.10250511.

[10] S. Degadwala, D. Vyas, A. Jadeja, and D. D. Pandya, “Empowering Maxillofacial Diagnosis Through Transfer Learning Models,” in Proceedings of the 5th International Conference on Inventive Research in Computing Applications, ICIRCA 2023, 2023, pp. 728–732. doi: 10.1109/ICIRCA57980.2023.10220830.

[11] S. Degadwala, D. Vyas, A. Jadeja, and D. D. Pandya, “Enhancing Alzheimer Stage Classification of MRI Images through Transfer Learning,” in Proceedings of the 5th International Conference on Inventive Research in Computing Applications, ICIRCA 2023, 2023, pp. 733–737. doi: 10.1109/ICIRCA57980.2023.10220651.

[12] S. Degadwala, D. Vyas, A. Kothari, and U. Khunt, “Cancer Death Cases Forecasting using Supervised Machine Learning,” in 2023 4th International Conference on Electronics and Sustainable Communication Systems, ICESC 2023 - Proceedings, 2023, pp. 903–907. doi: 10.1109/ICESC57686.2023.10193685.

[13] S. Degadwala, D. Vyas, P. Mitra, S. S. E. Roja, and S. K. Mandal, “Methods of Transfer Learning for Multiclass Hair Disease Categorization,” in 2nd International Conference on Automation, Computing and Renewable Systems, ICACRS 2023 - Proceedings, Dec. 2023, pp. 612–616. doi: 10.1109/ICACRS58579.2023.10404492.

[14] S. Degadwala, D. Vyas, D. D. Pandya, and H. Dave, “Multi-Class Pneumonia Classification Using Transfer Deep Learning Methods,” in Proceedings of the 3rd International Conference on Artificial Intelligence and Smart Energy, ICAIS 2023, 2023, pp. 559–563. doi: 10.1109/ICAIS56108.2023.10073807.

[15] S. Degadwala, D. Vyas, S. Panesar, D. Ebenezer, D. D. Pandya, and V. D. Shah, “Revolutionizing Hops Plant Disease Classification: Harnessing the Power of Transfer Learning,” International Conference on Sustainable Communication Networks and Application, ICSCNA 2023 - Proceedings, pp. 1706–1711, 2023, doi: 10.1109/ICSCNA58489.2023.10370692.

[16] S. Degadwala, D. Vyas, K. N. Patel, M. Soni, P. Parkash Singh, and R. Maranan, “Optimizing Hindi Paragraph Summarization through PageRank Method,” in Proceedings of the 2nd International Conference on Edge Computing and Applications, ICECAA 2023, 2023, pp. 504–509. doi: 10.1109/ICECAA58104.2023.10212107.

[17] S. Degadwala, D. Vyas, A. R. Raval, and M. Soni, “Crime Pattern Analysis and Prediction Using Regression Models,” International Conference on Self Sustainable Artificial Intelligence Systems, ICSSAS 2023 - Proceedings, pp. 771–

776, 2023, doi: 10.1109/ICSSAS57918.2023.10331747.

[18] S. Degadwala, D. Vyas, S. Trivedi, H. Dave, P. K. Nilaykumar, and P. Dalal, "Revolutionizing Prostate Cancer Diagnosis: Harnessing the Potential of Transfer Learning for MRI-Based Classification," Proceedings of the 4th International Conference on Smart Electronics and Communication, ICOSEC 2023, pp. 938–943, 2023, doi: 10.1109/ICOSEC58147.2023.10275879.

[19] S. Degadwala, D. Vyas, S. Upadhyay, R. Upadhyay, and H. S. Patel, "Determine the Degree of Malignancy in Breast Cancer using Machine Learning," 7th International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud), I-SMAC 2023 - Proceedings, pp. 483–487, 2023, doi: 10.1109/I-SMAC58438.2023.10290430.

[20] V. Desai, S. Degadwala, and D. Vyas, "Multi-Categories Vehicle Detection For Urban Traffic Management," in Proceedings of the 2023 2nd International Conference on Electronics and Renewable Systems, ICEARS 2023, 2023, pp. 1486–1490. doi: 10.1109/ICEARS56392.2023.10085376.

[21] V. N. Dasavandi Krishnamurthy, S. Degadwala, and D. Vyas, "Forecasting Future Sea Level Rise: A Data-driven Approach using Climate Analysis," in Proceedings of the 2nd International Conference on Edge Computing and Applications, ICECAA 2023, 2023, pp. 646–651. doi: 10.1109/ICECAA58104.2023.10212399.

[22] H. Lakhani, D. Undaviya, H. Dave, S. Degadwala, and D. Vyas, "PET-MRI Sequence Fusion using Convolution Neural Network," in 6th International Conference on Inventive Computation Technologies, ICICT 2023 - Proceedings, 2023, pp. 317–321. doi: 10.1109/ICICT57646.2023.10134462.

[23] J. N. Mehta, H. Lakhani, H. Dave, S. Degadwala, and D. Vyas, "EEG Brainwave Data Classification of a Confused Student Using Moving Average Feature," Proceedings - 2023 3rd International Conference on Pervasive Computing and Social Networking, ICPCSN 2023, pp. 1461–1466, 2023, doi: 10.1109/ICPCSN58827.2023.00243.

[24] S. Mewada, F. Patel, S. Degadwala, and D. Vyas, "Improved CAD Classification with Ensemble Classifier and Attribute Elimination," in Proceedings - 2023 3rd International Conference on Ubiquitous Computing and Intelligent Information Systems, ICUIS 2023, 2023, pp. 238–243. doi: 10.1109/ICUIS60567.2023.00048.

[25] S. Mewada, F. Patel, S. Degadwala, and D. Vyas, "Enhancing Raga Identification in Indian Classical Music with FCN-based Models," International Conference on Sustainable Communication Networks and Application, ICSCNA 2023 - Proceedings, pp. 980–985, 2023, doi: 10.1109/ICSCNA58489.2023.10370046.

[26] D. D. Pandya, A. Jadeja, S. Degadwala, and D. Vyas, "Diagnostic Criteria for Depression based on Both Static and Dynamic Visual Features," in IDCIoT 2023 - International Conference on Intelligent Data Communication Technologies and Internet of Things, Proceedings, 2023, pp. 635–639. doi: 10.1109/IDCIoT56793.2023.10053450.

[27] D. D. Pandya, A. Jadeja, S. Degadwala, and D. Vyas, "Diagnostic Criteria for Depression based on Both Static and Dynamic Visual Features," in IDCIoT 2023 - International Conference on Intelligent Data Communication Technologies and Internet of Things, Proceedings, 2023, pp. 635–639. doi: 10.1109/IDCIoT56793.2023.10053450.

[28] D. D. Pandya, S. Degadwala, D. Vyas, V. N. Solanki, S. V. Sureshbhai, and H. G. Patel, "Advancements in Multiple Sclerosis Disease Classification Through Machine Learning," in Proceedings - 2023 3rd International Conference

on Ubiquitous Computing and Intelligent Information Systems, ICUIS 2023, 2023, pp. 64–69. doi: 10.1109/ICUIS60567.2023.00019.

[29] D. D. Pandya, S. Degadwala, D. Vyas, S. V. Sureshbhai, L. Ainapurapu, and N. S. Bhavsar, “Advancing Erythemato-Squamous Disease Classification with Multi-class Machine Learning,” 7th International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud), I-SMAC 2023 - Proceedings, pp. 542–547, 2023, doi: 10.1109/I-SMAC58438.2023.10290599.

[30] D. D. Pandya, P. A. Patel, H. H. Patel, A. J. Goswami, S. Degadwala, and D. Vyas, “Unveiling the Power of Collective Intelligence: A Voting-based Approach for Dementia Classification,” 7th International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud), I-SMAC 2023 - Proceedings, pp. 478–482, 2023, doi: 10.1109/I-SMAC58438.2023.10290165.

[31] D. D. Pandya, A. K. Patel, J. M. Purohit, M. N. Bhuptani, S. Degadwala, and D. Vyas, “Forecasting Number of Indian Startups using Supervised Learning Regression Models,” in 6th International Conference on Inventive Computation Technologies, ICICT 2023 - Proceedings, 2023, pp. 948–952. doi: 10.1109/ICICT57646.2023.10134480.

[32] D. D. Pandya, S. K. Patel, A. H. Qureshi, A. J. Goswami, S. Degadwala, and D. Vyas, “Multi-Class Classification of Vector Borne Diseases using Convolution Neural Network,” in Proceedings of the 2nd International Conference on Applied Artificial Intelligence and Computing, ICAAIC 2023, 2023, pp. 1638–1645. doi: 10.1109/ICAAIC56838.2023.10140654.

[33] A. Patel, S. Degadwala, and D. Vyas, “Enhancing Traffic Management with YOLOv5-Based Ambulance Tracking System,” Canadian Conference on Electrical and Computer Engineering, vol. 2023-September, pp. 528–532, 2023, doi: 10.1109/CCECE58730.2023.10288751.

[34] C. H. Patel, D. Undaviya, H. Dave, S. Degadwala, and D. Vyas, “EfficientNetB0 for Brain Stroke Classification on Computed Tomography Scan,” in Proceedings of the 2nd International Conference on Applied Artificial Intelligence and Computing, ICAAIC 2023, 2023, pp. 713–718. doi: 10.1109/ICAAIC56838.2023.10141195.

[35] F. Patel, S. Mewada, S. Degadwala, and D. Vyas, “Recognition of Pistachio Species with Transfer Learning Models,” International Conference on Self Sustainable Artificial Intelligence Systems, ICSSAS 2023 - Proceedings, pp. 250–255, 2023, doi: 10.1109/ICSSAS57918.2023.10331907.

[36] F. Patel, S. Mewada, S. Degadwala, and D. Vyas, “Exploring Transfer Learning Models for Multi-Class Classification of Infected Date Palm Leaves,” International Conference on Self Sustainable Artificial Intelligence Systems, ICSSAS 2023 - Proceedings, pp. 307–312, 2023, doi: 10.1109/ICSSAS57918.2023.10331746.

[37] D. Rathod, K. Patel, A. J. Goswami, S. Degadwala, and D. Vyas, “Exploring Drug Sentiment Analysis with Machine Learning Techniques,” in 6th International Conference on Inventive Computation Technologies, ICICT 2023 - Proceedings, 2023, pp. 9–12. doi: 10.1109/ICICT57646.2023.10134055.

[38] P. Bam, S. Degadwala, R. Upadhyay, and D. Vyas, “Spoken Language Recognization Based on Features and Classification Methods: A Review,” in Proceedings of the 2nd International Conference on Artificial Intelligence and Smart Energy, ICAIS 2022, 2022, pp. 868–873. doi: 10.1109/ICAIS53314.2022.9743090.

[39] R. Baria, S. Degadwala, R. Upadhyay, and D. Vyas, “Theoretical Evaluation of Machine And Deep Learning For Detecting Fake News,” in Proceedings of the 2nd International Conference on Artificial Intelligence and Smart Energy, ICAIS 2022, 2022, pp. 325–329. doi: 10.1109/ICAIS53314.2022.9742864.

[40] S. Dave, S. Degadwala, and D. Vyas, "DDoS Detection at Fog Layer in Internet of Things," in International Conference on Edge Computing and Applications, ICECAA 2022 - Proceedings, 2022, pp. 610–617. doi: 10.1109/ICECAA55415.2022.9936524.

[41] V. B. Gadhavi, S. Degadwala, and D. Vyas, "Transfer Learning Approach For Recognizing Natural Disasters Video," in Proceedings of the 2nd International Conference on Artificial Intelligence and Smart Energy, ICAIS 2022, 2022, pp. 793–798. doi: 10.1109/ICAIS53314.2022.9743035.

[42] H. Gupta, D. Patel, A. Makade, K. Gupta, O. P. Vyas, and A. Puliafito, "Risk Prediction in the Life Insurance Industry Using Federated Learning Approach," in MELECON 2022 - IEEE Mediterranean Electrotechnical Conference, Proceedings, 2022, pp. 948–953. doi: 10.1109/MELECON53508.2022.9842869.

[43] J. Mahale, S. Degadwala, and D. Vyas, "Crop Prediction System based on Soil and Weather Characteristics," in 6th International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud), I-SMAC 2022 - Proceedings, 2022, pp. 340–345. doi: 10.1109/I-SMAC55078.2022.9987366.

[44] D. D. Pandya, A. Jadeja, S. Degadwala, and D. Vyas, "Ensemble Learning based Enzyme Family Classification using n-gram Feature," in Proceedings - 2022 6th International Conference on Intelligent Computing and Control Systems, ICICCS 2022, 2022, pp. 1386–1392. doi: 10.1109/ICICCS53718.2022.9788292.

[45] D. D. Pandya, G. Amarawat, A. Jadeja, S. Degadwala, and D. Vyas, "Analysis and Prediction of Location based Criminal Behaviors Through Machine Learning," in International Conference on Edge Computing and Applications, ICECAA 2022 - Proceedings, 2022, pp. 1324–1332. doi: 10.1109/ICECAA55415.2022.9936498.

[46] D. D. Pandya, N. S. Gupta, A. Jadeja, R. D. Patel, S. Degadwala, and D. Vyas, "Bias Protected Attributes Data Balancing using Map Reduce," in 6th International Conference on Electronics, Communication and Aerospace Technology, ICECA 2022 - Proceedings, 2022, pp. 1540–1544. doi: 10.1109/ICECA55336.2022.10009363.

[47] A. Patel, S. Degadwala, and D. Vyas, "Lung Respiratory Audio Prediction using Transfer Learning Models," in 6th International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud), I-SMAC 2022 - Proceedings, 2022, pp. 1107–1114. doi: 10.1109/I-SMAC55078.2022.9986498.

[48] M. Shah, S. Degadwala, and D. Vyas, "Diet Recommendation System based on Different Machine Learners: A Review," in Proceedings of the 2nd International Conference on Artificial Intelligence and Smart Energy, ICAIS 2022, 2022, pp. 290–295. doi: 10.1109/ICAIS53314.2022.9742919.

[49] V. K. Singh, S. Pandey, S. Degadwala, and D. Vyas, "DNA and KAMLA Approaches in Metamorphic Cryptography: An Evaluation," in Proceedings of the 2nd International Conference on Artificial Intelligence and Smart Energy, ICAIS 2022, 2022, pp. 1173–1178. doi: 10.1109/ICAIS53314.2022.9742764.

[50] B. Trivedi, S. Degadwala, and D. Vyas, "Parallel Data Stream Anonymization Methods: A Review," in Proceedings of the 2nd International Conference on Artificial Intelligence and Smart Energy, ICAIS 2022, 2022, pp. 887–891. doi: 10.1109/ICAIS53314.2022.9743084.

[51] H. Dave, V. Patel, J. N. Mehta, S. Degadwala, and D. Vyas, "Regional Kidney Stone Detection and Classification in Ultrasound Images," in Proceedings of the 3rd International Conference on Inventive Research in Computing Applications, ICIRCA 2021, 2021, pp. 1108–1112. doi: 10.1109/ICIRCA51532.2021.9545031.

[52] S. Degadwala, U. Chakraborty, P. Kuri, H. Biswas, A. N. Ali, and D. Vyas, "Real-Time Panorama and Image Stitching with Surf-Sift Features," in Proceedings of the 6th International Conference on Inventive Computation Technologies, ICICT 2021, 2021, pp. 1111–1115. doi: 10.1109/ICICT50816.2021.9358586.

[53] S. Degadwala, S. A. Musa, D. Vyas, and P. Mitra, "IoT Defence: An Internet Based Remote Area Monitoring and Control System," in Proceedings of the 5th International Conference on Electronics, Communication and Aerospace Technology, ICECA 2021, 2021, pp. 487–491. doi: 10.1109/ICECA52323.2021.9676144.

[54] S. Degadwala, B. Patel, and D. Vyas, "A Review on Indian State/City Covid-19 Cases Outbreak Forecast utilizing Machine Learning Models," in Proceedings of the 6th International Conference on Inventive Computation Technologies, ICICT 2021, 2021, pp. 1001–1005. doi: 10.1109/ICICT50816.2021.9358506.

[55] S. Degadwala, D. Vyas, H. Biswas, U. Chakraborty, and S. Saha, "Image Captioning Using Inception V3 Transfer Learning Model," in Proceedings of the 6th International Conference on Communication and Electronics Systems, ICCES 2021, 2021, pp. 1103–1108. doi: 10.1109/ICCES51350.2021.9489111.

[56] S. Degadwala, D. Vyas, U. Chakraborty, H. Biswas, and A. R. Dider, "Moving Object Inpainting using Deep Learning," in Proceedings of the 5th International Conference on Trends in Electronics and Informatics, ICOEI 2021, 2021, pp. 1701–1704. doi: 10.1109/ICOEI51242.2021.9452894.

[57] S. Degadwala, D. Vyas, U. Chakraborty, A. R. Dider, and H. Biswas, "Yolo-v4 Deep Learning Model for Medical Face Mask Detection," in Proceedings - International Conference on Artificial Intelligence and Smart Systems, ICAIS 2021, 2021, pp. 209–213. doi: 10.1109/ICAIS50930.2021.9395857.

[58] S. Degadwala, D. Vyas, and H. Dave, "Classification of COVID-19 cases using Fine-Tune Convolution Neural Network (FT-CNN)," in Proceedings - International Conference on Artificial Intelligence and Smart Systems, ICAIS 2021, 2021, pp. 609–613. doi: 10.1109/ICAIS50930.2021.9395864.

[59] S. Degadwala, D. Vyas, M. R. Hossain, A. R. DIder, M. N. Ali, and P. Kuri, "Location-Based Modelling and Analysis of Threats by Using Text Mining," in Proceedings of the 2nd International Conference on Electronics and Sustainable Communication Systems, ICESC 2021, 2021, pp. 1940–1944. doi: 10.1109/ICESC51422.2021.9532825.

[60] S. Patel, H. Patel, D. Vyas, and S. Degadwala, "Multi-Classifier Analysis of Leukemia Gene Expression from Curated Microarray Database (CuMiDa)," in Proceedings - 2nd International Conference on Smart Electronics and Communication, ICOSEC 2021, 2021, pp. 1174–1178. doi: 10.1109/ICOSEC51865.2021.9591854.

[61] S. Degadwala, U. Chakraborty, S. Saha, H. Biswas, and D. Vyas, "EPNet: Efficient patch-based deep network for real-time semantic segmentation," in Proceedings of the 3rd International Conference on Intelligent Sustainable Systems, ICISS 2020, 2020, pp. 611–615. doi: 10.1109/ICISS49785.2020.9316079.

[62] S. Degadwala, D. Vyas, H. Dave, and A. Mahajan, "Visual Social Distance Alert System Using Computer Vision Deep Learning," in Proceedings of the 4th International Conference on Electronics, Communication and Aerospace Technology, ICECA 2020, 2020, pp. 1512–1516. doi: 10.1109/ICECA49313.2020.9297510.