NEHRU ARTS AND SCIENCE COLLEGE

(An Autonomous Institution affiliated to Bharathiar University)
(Reaccredited with "A" Grade by NAAC, ISO 9001:2015 & 14001:2004 Certified,
Recognized by UGC with 2(f) &12(B), Under Star College Scheme by DBT, Govt. of India)
'Nehru Gardens', Thirumalayampalayam, Coimbatore - 641 105, Tamil Nadu.

DBT- Ministry of Science and Technology
Government of India Sponsored
(Star College Scheme)

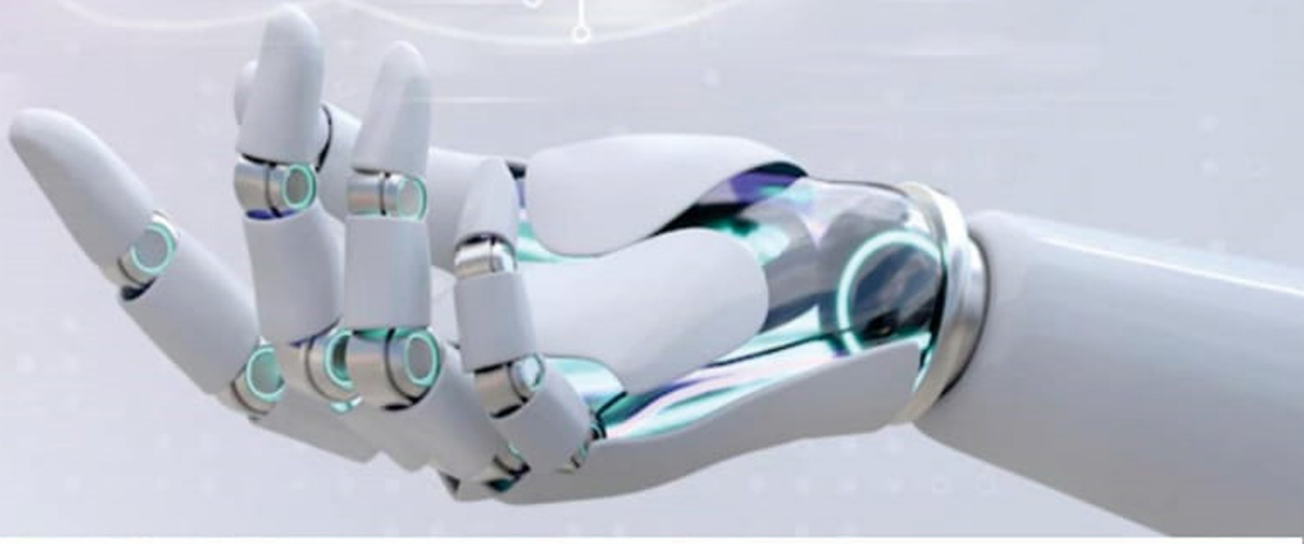
Proceedings of International Conference On

Interdisciplinary Research on Innovations in Science and Technology

ICIRIST - 2022

10th May 2022

Organised by
School of Computational Sciences
In Association with
ICT Academy of Tamil Nadu (ICTACT)



ICTACT
Innovate... Collaborate... Educate...

सत्यमेव जयते

Azadi Ka Amrit Mahotsav

INSTITUTION'S INNOVATION COUNCIL
(Ministry of HRD Initiative)

Proceedings of the

International Conference on

Interdisciplinary Research on Innovations in Science and Technology

ICIRIST 2022

10th May 2022

Organized by

School of Computational Sciences

In association with

ICT Academy of Tamil Nadu (ICTACT)

Nehru Arts and Science College

(Autonomous)

Re-Accredited with 'A' Grade by NAAC,

ISO 9001:2008 & ISO 14001: 2004 Certified

Recognized by UGC with 2(f) & 12(B) & Affiliated to Bharathiar University

"Nehru Gardens", Thirumalayampalayam, Coimbatore – 641105

Published by

Coimbatore Institute of Information Technology

#156, 3rd Floor, Kalidas Road,

Ramnagar, Coimbatore – 641009

Website: www.ciitresearch.org

This edition has been published by **Coimbatore Institute of Information Technology, Coimbatore.**

ISBN 978-93-91347-02-4
This Book is Printed in 70 gsm Papers.

Coimbatore Institute of Information Technology,
#156, 3rd Floor, Kalidas Road,
Ramnagar, Coimbatore - 641009.
Phone: 0422-4377821
www.ciitresearch.org

Proceedings of the

International Conference On
Interdisciplinary Research on Innovations in Science and Technology

ICIRIST 2022

10th May 2022

Published by,
Coimbatore Institute of Information Technology,
#156, 3rd Floor, Kalidas Road,
Ramnagar,
Coimbatore – 641009,
Phone: 0422-4377821.
www.ciitresearch.org

About the College

Nehru Arts and Science College (NASC), Autonomous is one of the renowned Colleges in Tamil Nadu. The college is Affiliated to Bharathiar University, recognized by UGC with 2(f) & 12-B status and Re-Accredited with "A" Grade (CGPA 3.10) by NAAC. ISO 9001:2015 & 14001:2004 Certified Institution is considered under STAR College Scheme by DBT, Government of India. The College has done remarkable contribution in higher education catering to the needs of the people in all walks of the society by offering quality education for 3500 students. It offers 10 Research, 07 Post Graduate and 25 Under Graduate Programmes in Arts, Life Science, Computational, Creative Sciences, Commerce and Management streams. We have the State-of-the-art facilities in all the departments to impart Outcome Based Education through Experiential Learning. The College is considered as a Nodal Centre for Spoken Tutorial of IIT Bombay, Recognized as study centre of TNOU, Recognized as a Mentoring Institution by Mahatma Gandhi National Council of Rural Education (MGNCRE), H R Ministry, Government of India, for implementing SWATCHTHA action plan. As part of ensuring Decentralization, the College is functioning as five different Schools. The College has received Accolades and Awards from various National and International Agencies for its meritorious contribution and ranked Top in India by various Ranking Agencies like India Today, Times of India etc. The Institution envisions to achieve the University status.

About the School of Computational Sciences

The School of Computational Sciences offer the following Programmes

B. C. A

B. Sc. (CS)

B. Sc. (IT)

B. Sc. AIML

B. Sc. DCFS

B. Sc. CS with DS

B. Sc. Mathematics with CA

B. Sc. Electronics and Communication Systems

B. Sc. Physics

M. Phil. & Ph. D. in Computer Science and Electronics

The school has more than 800 hundred students and a team of dedicated, highly qualified and experienced faculty members to mould the students to meet the challenges in the field of Computational Sciences. It also strives to be a centre of intellectual inspirations for the students and staff members and changing society to grow horizontally by rigorous research in diversified area by faculty members.

About the Conference

ICIRIST – 2022 aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results on all aspects of modern science and technology. It also provides a premier interdisciplinary platform for researchers, practitioners and educators to present and discuss the most recent innovations, trends, and concerns as well as practical challenges encountered and solutions adopted in the recent innovations.

Message from Chairman & Managing Trustee

Dr. P. Krishna Das,
Managing Trustee,
Nehru Group of Institutions,
Tamil Nadu & Kerala.

Greetings and wishes to all the participants of this Mega International Event.

It gives me immense pleasure to be the Chief Patron of the international conference on inter disciplinary Research Innovation in Science and Technology (ICRIST 2022) an annual event scheduled on the 10th of May 2022.

My appreciations and compliments to all those who are the partakers of this great international event to be held at the Nehru Group of Institutions. It is a great commission to every one of us that the scientists, technocrats and young budding students should be moulded to explore the newer avenues of Research and Development. This is the only way to set the country in its progressive path and to attain the pinnacle of success, a cherished vision and dream of late Dr. A.P.J Abdul Kalam.

This common forum adorned by the international scientists, technocrats, industrialists and businessmen is a wonderful platform for information sharing and cross exchange the ideas and thoughts in a more swifter way. It is more so for the young budding scientists and students wherein this occasion opens up their minds and ignite their spirits towards achieving scientific laurels.

Last but not the least, I extend my personal appreciations and congratulate the Chairman, Convener and the members of the organizing committee for their showcasing of their skill and solidarity in making this unique event a reality.

I wish the conference a great success.

Message from CEO & Secretary

Dr. P. Krishna Kumar,
CEO & Secretary,
Nehru Group of Institutions,
Coimbatore.

I am extremely happy to know that the Post Graduate and Research Department of Computer Science in Nehru Arts and Science College, an off shoot of Nehru Group of Institutions is venturing into organizing an international event namely International Conference on Interdisciplinary Research Innovations in Science and Technology (ICIRIST- 2022), scheduled on 10th May 2022 at Nehru Arts and Science College, Coimbatore.

I am sure this unique platform consisting of international scientists, technocrats, industrialists, businessmen, teachers and students will bring in the new dimensions of Research & Development, findings and strategies to be heard and recorded over the countries far and near globally.

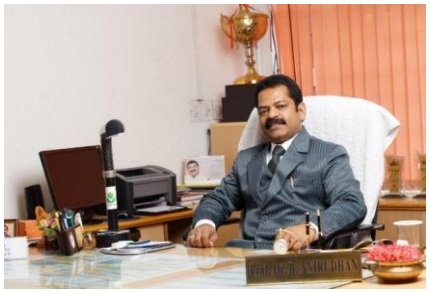
I am proud to learn that the updated and current frontal lines of research and developments will be presented and discussed face to face.

As CEO and Secretary of the Nehru Group of Institutions, I pass on my heartfelt and sincere thanks to the Chairman, Convener and the members of the organizing committee for their team work skill and commitment in staging this international event at the Nehru Group of Institutions.

I confident that a1l the participants to feel at home and enjoy the new vibrant scientific environment, energizing and enlightening their race towards achievements of their set goal.

I take this opportunity to wish the conference every success.

Message from the Principal



Dr. B. Anirudhan,
Principal,
Nehru Arts and Science College,
Coimbatore.

I am deeply honored and highly privileged to be the part of International Conference on Interdisciplinary Research Innovations in Science and Technology (ICIRIST- 2022), organized by Departments School of Computational Sciences during 10th May 2022.

The prime objective of this conference is to provide an intellectual platform for the international community of academicians, industry professionals, researchers and students of higher education to accomplish and showcase their research outcomes. This opportunity can act as a golden platform for the entire team to network with outstanding innovators and eminent researchers of global standards.

I am indeed happy to convene this Conference which explores the various research areas to help the student community. I hope that the platform that we have created for ourselves for learning from each other and sharing the core ideas of each discipline will also be a launching pad for the future collaborations and Innovations. I understand that the deliberations, the interactions and the exchange of the knowledge and facilitating of collaborations amongst the world's leading experts in the said domains will provide a road map, minimum for the next two decades.

I take this opportunity to congratulate the Convener, Organizing Secretaries and Organizing Team for their untiring efforts in organizing the event in the most befitting manner. I do consider this occasion as a special privilege to sincerely thank the Management for having permitted and fruitfully supported to carry out this endeavor. Further I thank all the Resource Persons who have promised to do wonderful deliberation during the sessions.

Finally, education is all about bringing out the innate potentials of mankind which could serve as the vital fuel to propel the engine of humanity for the sustenance of the universe and universal brotherhood.

Dr. B. Anirudhan

Message from the Dean

Dr. K. Selvavinayaki,
Dean, School of Computational Sciences

I am pleased to welcome all for International Conference on Interdisciplinary Research Innovations in Science and Technology (ICIRIST – 2022), Nehru Arts and Science College. It is a camouflage wealth of knowledge, innovation and technology that lies within. NASC in itself is a niche of opportunities to all aspiring researchers.

To keep up with the growth of technological revolution, the School of Computational Sciences brings before you ICIRIST - 2022. This conference is a unique forum for exchange of innovative ideas, technical expertise for technological advancements etc. in this ever growing field. It includes keynote address from Academicians and paper presentation by research scholars. It is a matter of joy for us to welcome the participants to this conference.

I thank the Management and Principal for their valuable support in conducting the conference. In a nutshell, the conference promises to transcend to a new and unprecedented level of excellence. It is thus the zenith where technology and skill meets the opportunities and guidance.

(Dr.K.Selvavinayaki)

Message from the Convenor

Dr. N. Kavitha,
Head, Department of Computer Scienc

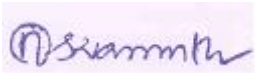
Dear Participants,

It is a great pleasure for me in organizing International Conference on Interdisciplinary Research Innovations in Science and Technology (ICIRIST- 2022), at Nehru Arts and Science College, Coimbatore. I welcome you all for this conference ICIRIST- 2022.

The conference is a meeting and information exchange between the end-user, the development and the research communities. The purpose of this conference is to bring to gather researchers, experts from industry, academia, and other interested organizations meet, exchange information and ideas in developments in the field of Computer. The conference program has been designed to provide ample opportunities to researchers to network and to share ideas and information.

I hope this conference ICIRIST- 2022 will be educative, enjoyable, memorable, and productive for participants looking forward to the technological innovations that result from you networking and discussions. I thank the management, principal for providing me this wonderful opportunity. I also thank chief guest, resource persons, organizing secretary and organizing team for their whole hearted support in conducting the function successfully.

"Wish you all success"



Dr. N. Kavitha

Organizing Committee

Chief Patron

Dr. P. Krishna Das,
Chairman and Managing Trustee,
Nehru Group of Institutions,
Tamil Nadu, India.

Patron

Dr. P. Krishna Kumar,
CEO & Secretary,
Nehru Group of Institutions,
Coimbatore,
Tamil Nadu, India.

Chair Patrons

Dr. B. Anirudhan,
Principal. NASC

Dr. K. Selvavinayaki,
Dean, SoCS

Convenor

Dr. N. Kavitha,
Asso. Professor & Head, CS

Organizing Secretaries

Dr. P. K. Manoj Kumar, HoD, IT
Dr. M. Sathishkumar, HoD, Electronics
Mr. A. Tony Dhiwahar, HoD, Physics
Ms. T. Chandrapushpam, HoD, Mathematics

Key Note Speakers:

Dr. Sharanjit Kaur
Head-Bachelor of Computer Science
School of Computing,
Quest International University
Malaysia.

Dr. S. R. Balasundaram
Professor,
Department of Computer Applications,
National Institute of Technology,
Tiruchirappalli

Dr. Selvakumar Samuel
Associate Professor
Department of Computer Science
Asia Pacific University
Malaysia.

Prof. Vipin Kumar
Assistant Professor
Indian Institute of Technology
New Delhi

Organizing Committee

Dr. D. Vimal Kumar, Associate Professor, CS
Dr. K. Prathapchandran, Assistant Professor (SG), BCA
Ms. P. Jeyanthi, Assistant Professor, IT
Dr. S. Kannan, Assistant Professor, ECS
Dr. K. Reena, Assistant Professor, Mathematics

Editorial Committee

Dr. N. Kavitha, HoD, CS
Dr. D. Surya Prabha, Assistant Professor, BCA

LIST OF PAPERS

International Conference on Interdisciplinary Research on Innovations in Science and Technology (ICIRIST 2022),
10th May, 2022

Machine Learning and Deep Learning Techniques for Classification of Skin Disease Diagnosis: A Review

A. Kalaivani[1] and Dr. S.Karpagavalli[2]

[1]*Assistant Professor, Department of Computer Technology, Nallamuthu Gounder Mahalingam College, Pollachi & Research Scholar, Department of Computer Science, PSGR Krishnammal College for Women., Coimbatore, Tamilnadu, India. E-Mail: kalaivanimathsca@gmail.com*
[2]*Associate Professor, Department of Computer Science, PSGR Krishnammal College for Women Coimbatore, Tamilnadu, India. E-Mail: karpagavalli@psgrkcw.ac.in*

***Abstract*---**People get skin diseases due to inheritance and environmental factors, so they are the most common across the worldwide. Early detection of skin problems seems critical for successful treatment options. Detecting skin illness and determining its kind is a difficult challenge in the medical field. Because of the intricacy of human skin texture and the visual proximity impact of illnesses, determining the specific type might be challenging. As a result, it is critical to diagnose and recognize skin illness as quickly as possible. Artificial intelligence (AI) is quickly expanding in medical disciplines in today's world. For diagnostic purposes, many machine learning (ML) and deep learning (DL) methods are applied. These techniques significantly enhance and speed up the diagnosing procedure. A brief comparison of the machine learning and deep learning processes was described in this article. Various image processing algorithms have been developed to identify skin cancer automatically as technology has progressed in recent years. Various strategies for categorizing skin lesions as benign or malignant are discussed in this study. We examined skin-related condition categorization using machine learning and image processing algorithms in this study.

***Keywords*---**Deep learning, Image processing, Machine learning, Skin disease.

I. INTRODUCTION

THERE are several sorts and varieties of skin disorders, each with its own set of reasons, such as internal ones involving hormones and bodily glands, such as acne, or exterior ones involving air pollution or sun sensitivity, such as rashes. Skin disease can only be identified by dermatologists with extensive clinical expertise and is seldom repeatable because to its complexity, diversity, and resemblance. An untrained dermatologist is prone to misdiagnose it, which can worsen the problem and prevent proper treatment. Thus, a rapid and reliable approach to aid patients and dermatologists in data processing and evaluation is required. Skin diseases are frequent among many illnesses, and if these tactics are not fit for that form of skin condition, they will backfire. People are quickly infected by skin illnesses, which must be treated as early as possible.

Recent advances in the use of machine learning techniques in computer vision have resulted in significant advancements in computer assisted diagnosis and detection systems for the early identification of dangerous malignant skin disorders. With inspiration from the human nervous system, advances in deep learning have influenced several scientific and industrial fields and resulted in significant successes. With the rapid advancement of deep learning in biomedical data processing, many experts have turned to this method to obtain more exact and reliable data. Deep learning has gained significant success in a variety of medical image processing challenges as the amount of available biomedical data, such as photographs, medical records, and omics, has increased rapidly. The complexity of categorization is enhanced when each human skin characteristic is considered separately, and human extraction of characteristics is insufficient for classifying. Deep learning for disease detection has emerged as an exciting new research subject in dermatology. This paper will discuss how to diagnose skin diseases using deep learning to assess the characteristics of skin lesions and the current state of imaging methods. These deep learning-based algorithms, on the other hand, have a considerable training requirement, which is a huge number of annotated pictures for each class. Dermoscopy appears to be an image processing technology for reducing skin surface reflection and allowing in-person evaluation of problems inside the skin layers. With a better resolution, additional visual input from the skin layers may be obtained.

Machine learning is a field that can assist in predicting illness diagnosis using previously trained data. Various machine learning approaches have been developed by many scientists to identify various illnesses efficiently. Machine learning allows machines to learn without having to be expressly programmed. Machine learning algorithms can be used to create a model that can identify disease early on and suggest remedies. Early detection and treatment are the most effective ways to reduce disease-related mortality rates. As a result, most medical experts are drawn to new predictive model technologies based on machine learning algorithms for illness prediction.

Without specific guidelines, machine learning models learn from patterns in supplied training samples and then utilize inference to build meaningful predictions. In the medical field, classification algorithms are widely used to better detect and forecast disorders. Diseases and health issues such as liver cancer, chronic renal disease, breast cancer, diabetes, and cardiac syndrome have a substantial influence on one's health

and, if ignored, can lead to death. The healthcare business will make effective judgments by extracting hidden patterns and correlations from the database. Several classifiers and clustering methods, such as K-nearest, Decision Tree, Random Forest, Support Vector Machine (SVM), Nave Bayes, and others, can provide a solution to this scenario thanks to advances in machine learning and artificial intelligence.

The most well-known of these deep learning model is CNN, which is designed to train image characteristics and detect skin disorders. Pre-trained CNNs would be used in an improved training model to explain the better pictures. In order to categories all sorts of input photos, such neural networks are trained on millions of photographs. Residual Network, AlexNet architecture, ImageNet, and VGGNet are examples of freely pre-learned neural network based models that may be used to execute various tasks.

The structure of the entire article is as follows: The second section focuses into prior research on the classification of skin conditions. Section III provides an overview of machine learning methods and the Deep Convolutional Neural Networks Classifier, and Section IV shows the discussions. Section V includes the summary and offers recommendations for its future path.

II. Literature Survey

Several researchers have proposed skin disease detection strategies based on imaging examinations. We will go through some of the techniques that have been mentioned in the literature at this point.

Thiruna Vukkarasu K. et al, [1] employed several classification algorithms to predict liver disease in 2018. The techniques utilized in this study were logistic regression, k-nearest neighbour, and support vector machines. The confusion matrix and the effectiveness score are used to compare these classification algorithms.

Melanoma cancer, for instance, has a high mortality rate but can be readily curable if diagnosed early [2, 3]. Various computerized technologies have been used in the detection and diagnosis of skin cancer throughout the years. A set of low-level pixel processing algorithms are often used in the traditional approach to medical picture analysis. In general, main processing approaches such as image pre-processing, image segmentation, feature extraction, and classification of lesions pictures have been outlined in the pipeline process of melanoma cancer detection and diagnosis [4].

The ISIC 2017 database, which contains over 2000 high quality dermatoscopic pictures categorized into three primary categories: melanoma, nevus, and keratosis, is used in this study. Testing evaluates if these data are sufficient for diagnosing and rejecting benign and malignant dysplasic lesions with high accuracy. Many epidermal lesion detectors have been proposed using Deep Learning models based on Convolutional Neural Networks (CNN), such as the GoogLeNet, AlexNet-ResNet-VGGNet ensembles [5], R CNN [6], the Mask and Region-based Convolutional Neural Network (Mask R CNN) and DeeplabV3+ method ensemble [7], and in general many CNN structures, making this strategy one of the most powerful for effective feature investigation [8].

The most recently published dermatoscopic image classification work (malignant/benign) for the ISIC (International Skin Imaging Collaboration) 2017 challenge is used as a reference within the reviewed state-of-the-art, using data from the International Symposium on Biomedical Imaging (ISBI) 2017 challenge. With our suggested technique, we do an objective comparison of findings utilizing the challenge's assessment criteria, such as specificity, sensitivity, and accuracy.

However, we included a new statistic called balance accuracy, which was recommended for this particular instance of an imbalanced database [9-11]. A Receiver Operating Characteristic (ROC) space is provided to compare and illustrate the performance of several classifier models in a single graph; this is a highly helpful statistic for decision-making in the medical industry, and its application in machine learning research has been rising [12].

Researchers in [13] presented a detailed neural network for detecting skin lesions in input skin visuals using medical imaging. They developed a prototype device to diagnose skin diseases using approach. The goal of this research is to detect and diagnose skin disease using texture analysis based on thresholding and neural networks based on input skin images.

III. Skin Lesion Image Analysis Techniques

Machine learning (ML) is a subfield of artificial intelligence that allows machines to think like humans and make decisions without the need for human involvement [14]. It is the technique of causing robots to learn without being explicitly programmed. The main goal of Machine Learning is to create a computer software that can access data and learn from it. There are several forms of machine learning.

Each sort of machine learning will be briefly defined in this section. The algorithm learns to predict data from input data using supervised learning, and this form of data contains both input and output data. In unsupervised learning, the algorithm is given simply input data and is instructed to learn the underlying structure from it [15]. Furthermore, both strategies are required for semi-supervised learning (supervised and unsupervised). They use both labelled and unlabeled data, which means that some input data has label data and some do not. In reinforcement learning, the system tries to learn from its surroundings by rewarding desired actions and punishing undesirable ones [16]. The usage of these technologies is employed for a variety of medical activities, including illness diagnosis [17]. Deep learning is a subset of machine learning that comprises of numerous layers that store different levels of perception, with each layer receiving data from the previous layer and passing the result on to the next.

The illness is identified using a variety of machine learning algorithms. The following are the majority of them that were detected in this review paper:

A. K Nearest Neighbour Algorithm (KNN)

KNN is a basic model that is commonly used in machine learning for classification, pattern matching, and regression applications. KNN finds data neighbours based on the Euclidean distance between data points. This algorithm is used to solve issues involving classification and regression. Moreover, the value of k (where k is a user-defined value) will discover all existing feature cases that are comparable to the new case and surround all instances in order to find the new case for a similar category [18]. As a result, the K value is important and must be carefully determined because a lower K value might lead to over-fitting. There are certain drawbacks, such as low performance when dealing with a large training dataset. Because we must calculate the distance between all training samples and each query instance, the computation cost is quite large.

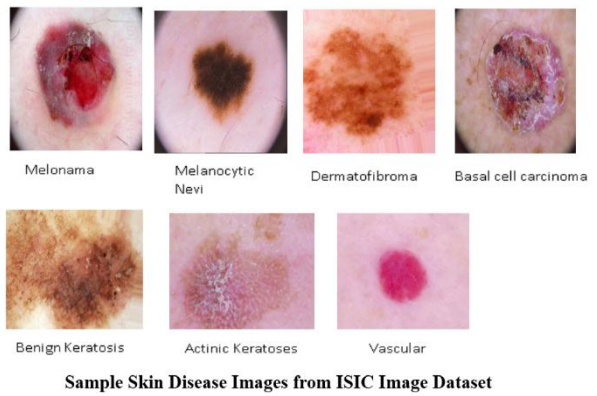


Fig 1. Example Dermoscopy Images for Skin Sores of HAM Dataset

B. Support Vector Machine

For several classification tasks, the Support Vector Machine (SVM) has proven to be effective [19]. The number of points on the class descriptors' edge is used to discover the optimum hyperplane among classes. The margin is the distance between two classes. When there is a larger margin, the classification accuracy improves. Support vectors are the data points on the boundary. Both regression and classification issues are solved using SVM. Furthermore, shrinking the image shortens the processing time and hence improves system performance.

SVM classifies data points into two classes by operating on high-dimensional space for features and selecting the optimum hyper-plane. It works well with both small and large datasets.

C. Naive Bayes Algorithm

Naive Bayes (NB) is a classification algorithm-based probability and statistical strategy. Because of its simplicity in allowing all characteristics to contribute equally to the final decision, it is a typical method in machine learning applications. The NB technique is intriguing and applicable for a variety of applications because of its computational efficiency. Prior, posterior, and class conditional probability are crucial components of the NB classification [20]. This approach has several advantages, including being simple to apply with large datasets and being quite effective. It might be used to solve binary and multiclass classification issues. A lesser quantity of training data is required, and both discrete and continuous data can be employed. This computation application is also used to filter spam emails and categories studies [21].

D. Decision Tree Algorithm

The Decision Tree (DT) is a supervised machine learning technique that divides data repeatedly based on a variable to solve regression and classification problems.

The data is organized into nodes, with the leaf of the tree representing final judgments. The goal of the decision tree is to learn basic decision rules using training data in order to build a model that can be used to predict the target variable [22]. During the training phase, the tree is built using the training data. The class name is stored in the leaf nodes, but a decision node is not. The decision tree is used to organize category and numerical information. The tree's efficiency is unchanged by the nonlinear relationship between arguments.

E. Deep Learning Classification Technique

Deep learning is a subset of machine learning that uses nonlinear transformations. It employs a number of algorithms that can learn how to interpret incoming data utilising several levels of processing and complex structures. Recurrent neural networks (RNN), deep autoencoders, and convolutional neural networks are examples of deep learning architectures (CNN). These algorithms have been used to a variety of fields, including natural language processing, speech recognition, and medical applications. RNN is a deep learning algorithm that keeps current information in internal memory. In RNN architecture, memory units in general contain linkages to each other that transmit information from the previous execution. RNN modifies the present forward process in order to adapt to the context of current input [23]. Because the region of interest in MRI medical pictures is often dispersed across multiple neighbouring slices, subsequent slices have commonalities. As a kind of sequential data, RNN may extract inter-slice contexts from the input slices [24].

Another deep learning approach, the convolutional neural network (CNN), is used to address complicated issues and categorization using a huge number of datasets. Convolution, max-pooling, fully linked, and the output layer are the four layers that make up the model. CNN structure for medical image classification with multi classes that accepts a sub picture of 32×32 from the medical image. Each convolutional layer generates a feature map of various sizes, and pooling layers reduce the size of feature maps to be passed to the following layers, allowing the fully connected layer to provide output as a prediction of the right class [25].

TABLE 1
THE ADVANTAGE AND DISADVANTAGE OF THE MENTIONED MACHINE LEARNING TECHNIQUES IN SECTION THREE

Machine -Learning Techniques	Merits	Demerits
KNN	A model is inexpensive and simple to apply. Both classification and regression are possible with this method. On multiclass issues, it runs nicely.	The amount of computation is enormous. The cost of classifying unknown records is high. High sensitivity to unnecessary information.
SVM	It is capable of handling both linear and nonlinear data. There is a lower chance of overfitting. Scale-up with large-scale data.	When working with a huge dataset, performance suffers. Selecting an appropriate kernel function is difficult. When a dataset is noisy, they don't operate well.
Naive Bayes	The simple option for large datasets. Deals with both discrete and continuous data. Both binary and multi-classification are possible. Irrelevant characteristics have no effect.	Models with several variables are very computationally expensive. Models that have been properly trained and tweaked can sometimes outshine Nave Bayes models, which are too simplistic.
Decision Tree	Both regression and classification are possible with this method. Handling numeric and categorical data is simple.	Over-fitting may arise as a result of the tree's repetitive building. Larger trees are more difficult to read.
Deep Learning	Features are automatically detected. It may be used with a variety of data types.	GPUs are required for training. Because of the complicated data models, training is quite expensive.

IV. DISCUSSION

All of the publications discussed in the preceding section are related research from 2009 to 2021 that employed various machine learning methods to diagnose illnesses. Many techniques, such as K-nearest neighbour, support vector machine, decision tree, and an ensemble model, are employed in the reviewed study. These methods were also applied to standard datasets in a number of disorders.

KNN and SVM algorithms were used to two separate datasets and features in [26] and [27]. The SVM method outperformed the KNN algorithm in [26]. In contrast, the KNN method outperforms SVM by roughly 4% in [27]. According to study [27], the decision tree's accuracy is roughly 1% higher than the random forest. The accuracy of the ensemble model utilized by researchers in [28] and [29] was 98.50 percent and 90 percent, respectively. SVM is the sole binary classifiers, but decision trees, KNN, nave Bayes, and CNN can classify into more than two groups.

When the dataset is small, all algorithms function well, however deep learning techniques such as CNN are superior for huge datasets. To summarize, the accuracy of the technique is dependent on the size of the dataset and the number of features, and the ensemble model produces better results than a statistical model.

V. CONCLUSION

Machine learning has been popular in the medical field for offering tools and assessing illness data. As a result, machine learning algorithms are critical in attaining early illness diagnosis. This research reviewed numerous machine learning algorithms for illness prediction, and standard datasets have been utilised in diseases such as Skin disease, breast cancer, heart disease, Skin tumors, and many more. After reviewing multiple articles for various illness prediction models, it was discovered that several algorithms for predicting SVM, K-nearest neighbours and the decision tree had high accuracy. Nonetheless, the accuracy of the same method may vary from one dataset to the next since several significant parameters, such as datasets, feature selection, and the quantity of features, influence the model accuracy and performance. Another important finding in this review is that by utilizing a different technique to create one ensemble model, the model's accuracy and performance may be improved.

ACKNOWLEDGMENTS

I convey my sincere thanks to the management of Nallamuthu Gounder Mahalingam College, Pollachi, for allowing me to carry out this research work by funding with SEED MONEY. I extend my sincere thanks to the Principal, Deans, HoD and Manager of Nallamuthu Gounder Mahalingam College, Pollachi for providing the necessary facilities to carry out the present work.

REFERENCES

[1] Thirunavukkarasu K, Ajay S. Singh, Md Irfan and Abhishek Chowdhury, "Prediction of Liver Disease using Classification Algorithms", International Conference on Computing Communication and Automation (I.C.C.C.A.), IEEE, 2018.

[2] Al-Masni MA, Al-antari MA, Choi M-T, Han S-M, Kim T-S (2018) Skin lesion segmentation in dermoscopy images via deep full resolution convolutional networks. Comput Methods Programs Biomed 162:221–231.

[3] Balch CM, Gershenwald JE, Soong S, Thompson JF, Atkins MB, Byrd DR, Buzaid AC et al (2009) Final version of 2009 AJCC melanoma staging and classifcation. J Clin Oncol 27(36):6199.

[4] Unver HM, Ayan E (2019) Skin lesion segmentation in dermoscopic images with combination of YOLO and grabcut algorithm. Diagnostics 9(3):72.

[5] Harangi B. Skin lesion classifcation with ensembles of deep convolu‑ tional neural networks. J Biomed Inform. 2018;86:25–32. https://doi.org/10.1016/j.jbi.2018.08.006.

[6] Nida N, Irtaza A, Javed A, Yousaf MH, Mahmood MT. Melanoma lesion detection and segmentation using deep region based convolutional neural network and fuzzy C-means clustering. Int J Med Inform. 2019. https://doi.org/10.1016/j.ijmedinf.2019.01.005.

[7] Goyal M, Yap MH. Automatic lesion boundary segmentation in dermo‐scopic images with ensemble deep learning methods. 2019. http://arxiv.org/abs/1902.00809. Accessed 16 July 2019.

[8] Jafari MH, Nasr-Esfahani E, Karimi N, Soroushmehr SMR, Samavi S, Najarian K. Extraction of skin lesions from non-dermoscopic images using deep learning. Int J Comput Assist Radiol Surg. 2016. https://doi.org/10.1007/s11548-017-1567-8.

[9] Brodersen KH, Ong CS, Stephan KE, Buhmann JM. The balanced accuracy and its posterior distribution. In: 20th International conference on pattern recognition. 2010; p. 3121–24. https://doi.org/10.1109/ICPR.2010.764.

[10] R. J. Urbanowicz, J. H. Moore (2015) ExSTraCS 2.0: description and evaluation of a scalable learning classifer system. Evol Intell 8(2–3): 89–116. DOI: https://doi.org/10.1007/s12065-015-0128-8.

[11] Velez DR, et al. A balanced accuracy function for epistasis modeling in imbalanced datasets using multifactor dimensionality reduction. Genet Epidemiol. 2007;31(4):306–15. https://doi.org/10.1002/gepi.20211.

[12] Fawcett T. An introduction to ROC analysis. Pattern Recognit Lett. 2006. https://doi.org/10.1016/j.patrec.2005.10.010.

[13] Ambad, Pravin S., and A. S. Shirat, "A Image Analysis System to Detect Skin Diseases," IOSR Journal of VLSI and Signal Processing (IOSR-JVSP), Volume 6, Issue 5, Ver. I (Sep. - Oct. 2016), PP 17-25.

[14] Golmei Shaheamlung, Harshpreet Kaur and Mandeep Kaur, "Survey on machine learning techniques for the diagnosis of liver disease", International Conference on Intelligent Engineering and Management, IEEE, 2020.

[15] AJAY SHRESTHA and AUSIF MAHMOOD, "Review of Deep Learning Algorithms and Architectures", IEEE, 2019.

[16] Yuanyuan Jia, Zhiren Tan and Junxing Zhang, "DKDR: An Approach of Knowledge Graph and Deep Reinforcement Learning for Disease Diagnosis", IEEE Intl Conf on Parallel & Distributed Processing with Applications, Big Data & Cloud Computing, Sustainable Computing & Communications, Social Computing & Networking, 2019.

[17] Meherwar Fatima and Maruf Pasha, "Survey of Machine Learning Algorithms for Disease Diagnostic", Journal of Intelligent Learning Systems and Applications, 2017.

[18] Animesh Urgiriye and Rupali Bhartiya," Review of Machine Learning Algorithm on Cancer Data Set", International Journal of Scientific Research & Engineering Trends, Volume 6, Issue 6, Nov-Dec-2020.

[19] Adnan Mohsin Abdulazeez, Maryam Ameen Sulaiman, Diyar Qader Zeebaree, "Evaluating Data Mining Classification Methods Performance in Internet of Things Applications", Journal Of Soft Computing And Data Mining, Vol.1, NO. 2, pp. 11-25, 2020.

[20] Aji Prasetya Wibawa and et al, "Naive Bayes Classifier for Journal Quartile Classification", IJES – Vol. 7, No. 2, 2019.

[21] Shahadat Uddin, Arif Khan, Md Ekramul Hossain and Mohammad Ali Moni3, "Comparing different supervised machine learning algorithms for disease prediction", B.M.C. Medical Informatics and Decision Making, 2019.

[22] Yash Jayesh Chauhan, "Cardiovascular Disease Prediction using Classification Algorithms of Machine Learning", International Journal of Science and Research (I.J.S.R.), ISSN: 2319-7064, 2018.

[23] Tarek M. Hassan1, Mohammed Elmogy and El-Sayed Sallam, "Diagnosis of Focal Liver Diseases Based on Deep Learning Technique for Ultrasound Images", pulished onlinee, springer, 2017.

[24] Siwei Ma, Xinfeng Zhang, Chuanmin Jia, Zhenghui Zhao, Shiqi Wang, and Shanshe Wang, " Image and Video Compression with Neural Networks: A Review", IEEE Transactions On Circuits And Systems For Video Technology, 2019.

[25] Mohammad Hesam Hesamian,Wenjing Jia, Xiangjian He and Paul Kennedy, "Deep Learning Techniques for Medical Image Segmentation: Achievements and Challenges", Journal of Digital Imaging, Springer, 2019.

[26] Ankita Tyagi, Ritika Mehra and Aditya Saxena, "Interactive Thyroid Disease Prediction System Using Machine Learning Technique", 5th IEEE International Conference on Parallel, Distributed and Grid Computing(PDGC-2018), Solan, India, 20-22 Dec 2018.

[27] Noor Basha, Ashok Kumar P S, Gopal Krishna C and Venkatesh P, "Early Detection of Heart Syndrome Using Machine Learning Technique", 4th International Conference on Electrical, Electronics, Communication, Computer Technologies and Optimization Techniques (ICEECCOT), 2019.

[28] Naresh Khuriwal and Nidhi Mishra, "Breast Cancer Diagnosis Using Adaptive Voting Ensemble Machine Learning Algorithm", IEEE, 2018.

[29] Rahma Atallah and Amjed Al-Mousa, "Heart Disease Detection Using Machine Learning Majority Voting Ensemble Method", IEEE, 2019.

A. Kalaivani, Assistant Professor, Department of Computer Technology, Nallamuthu Gounder Mahalingam College, Pollachi. She has 9 years of teaching experience. She has been recognized guide under Bharathiar University to guide MPhil scholars in the area of Data Mining. She received her M.Phil Degree in the field of Data Mining from Sree Sareswathi Thyagaraja College of Arts and Science Pollachi and as Ph.D research scholar in the area of Data Mining in PSGR Krishnammal College for Women, located in Coimbatore. She got circulated 07 study documents in National, International Journals and 4 National Conferences in the broad filed of computer science.

Dr. S. Karpagavalli, Associate Professor and Head, Department of Computer Science (UG), PSGR Krishnammal College for Women, Coimbatore, has 22 years of teaching experience. She has guided 15 MPhil Scholars and currently guiding 4 PhD Scholars in the areas Data Mining, Machine Learning and speech recognition, also has published 42 research papers in International Journals and IEEE, Elsevier, Springer conference Proceedings. She has been acting as reviewer in reputed journals and authored 7 books. She is a member of Computer Society of India (CSI), International Association of Computer Science and Information Technology (IACSIT), International Association of Engineers (IAENG) and Indian Society for Technical Education (ISTE). She is a recipient of Best Researcher Award from Indian Academic Researchers' Association (IARA), and Nation Builder Award from IQAC and Rotaract club Coimbatore.

She has been recognized guide under Bharathiar University to guide MPhil scholars. She have produced 14 MPhil scholars and currently guiding 1 MPhil scholar. She have authored a book on Object Oriented Analysis and Design for Beginners and principal investigator of project Tamil Speech enabled interface for children with learning disabilities funded by GRG Trust in August 2017.

NEHRU GROUP OF INSTITUTIONS
TAMILNADU • KERALA
Moulding True Citizens
ISO 14001 - 2004 CERTIFIED INSTITUTIONS

TAMILNADU

- Nehru College of Aeronautics & Applied Sciences.
- Nehru College of Management.
- Nehru Arts and Science College.
- Nehru Institute of Engineering and Technology.
- Nehru Institute of Technology.
- Nehru Institute of Information Technology and Management.
- Nehru Institute of Management Studies.
- Nehru Industrial School of Hotel Management.
- Nehru School of Architecture.
- Nehru Technical Training College.

KERALA

- Nehru College of Engineering and Research Centre.
- Nehru School of Management.
- Jawaharlal College of Engineering & Technology.
- Jawaharlal Aviation Institute.
- Nehru College of Architecture.
- PK Das Institute of Medical Sciences.
- Nehru College of Nursing.
- Nehru College of Pharmacy.
- Nehru Academy of Law.

Published by

CiiT think to be different

Coimbatore Institute of Information Technology
#156, Kalidas Road, Ramnagar,
Coimbatore - 641009, Tamilnadu, India,
Phone - (0422) 4377821, Mail - editor@ciitresearch.org
www.ciitresearch.org

ISBN 9789391347024
9 789391 347024