Name: N. Sai Ganesh
Reg no/Branch: 192111102/CSE
Guide: Dr. Bhuvaneshwari

TITLE: Enhancing Iron deficiency detection Based on palm image by CNN and SVM.

Paragraph 1:

Abstract:

Iron deficiency is one of the global public health problem that affects children and pregnant women. The non invasive approach such as machine learning algorithm is one of the procedures and method used in detecting clinical diseases of which anemia detection cannot be left out in recent times.

Importance:

To determine the efficiency of Iron deficiency detection using CNN compared to SVM. CNN is most reliable in anemia detection using image classification and it is cost effective and timely result oriented.

Paragraph 2:

Total number of articles published on this topic is more than 32 papers from scholar IEEE Explore.

Most cited articles:

* Kavsaoglu AR; Polat K, Hariharan - Non invasive prediction of hemoglobin level using machine learning, 2015
* Al-alimi, Bashanfer - prevalence of iron deficiency anemia among university student in Hodeida, 2016
* pasricha, Tye-Din - Iron deficiency 2021
* Khan, chowdhury - Machine learning Algorithm to predict the childhood anemia, 2021
* Dithy, Krishnapriya - Anemia selection in pregnancy women by using random prediction, 2019

para 1:

Applications:

* Early detection and diagnosis
* patient screening
* Decision support health care professionals
* public health
* clinical trials and research
* Remot monitoring

paragraph 2:

Data availability and quality:

Data is collected from hospital using Kobo collect app about patient Hbvalue, age, Gender, disease, blood level and palm images of both Aremic and non Aremic patients are collected.

Algorithm Complexity and performance:

Designing and optimizing CNN algorithm for iron deficiency detection is sophisticated technique.

Ethical Consideration:

Before the study began the ethical consent from various hospital comittees are taken and permission of parents for taking pictures of palm of children both aremic and non aremic patients.

Feature extraction:

Identifying the most informant features and optimizing features extraction methods for CNN and could be more complex.

materials and methods

paragraph 1:

study setup: Saveetha school of Engineering

no of groups: 2

Sample size: 10

Total size: 20

Dataset:

The dataset for palpable palm images of Anemic and non Anemic patients is taken from "mendeley data"

paragraph 2:

procedure: [CNN]

* Define the problem
* Gather & prepare data
* Split data into training and testing sets
* Build a CNN model
* Compile the model
* Train the model
* Evaluate the model
* Deploy

paragraph 3: [SVM]

procedure:

* Define the problem
* Gather and prepare data
* Split data into Training and Testing sets
* Build SVM model
* Make predictions
* Evaluate the model
* Deploy
* Result

paragraph 4:

* Google Collab
* Intel core i3
* 8GB RAM
* Windows operating system
* SPSS IBM

Test procedure:

Data collection: Gather the datasets that contain information about iron deficiency detection

Model development: Implementing Convolutional neural network algorithm and model with text features

Training and testing: Training and testing convolutional neural network model that evaluates its performance

paragraph-5:

S.NO	Algorithm	Sample size	Accuracy
1.	CNN	10	96.49
2.	SVM	10	88.70

paragraph-6:

i.) Statistical software used: IBM SPSS version 27

ii.) Independent variables:
* CNN
* SVM

iii.) Results and Discussion:

Table 1: It displays the improvement of accuracy of CNN

Table 2: It displays the anticipated accuracy of SVM

Table 3: provides the accuracy after SVM with improving standard error

Table 4: Compares the accuracy of SVM to that of CNN.

Previous literature:

Limitation: Difficult in getting more accuracy with SVM because of May required careful tuning of hyperparameters, can be computationally intensive.

Feature scope:

CNN can be combined with SVM because other machine learning algorithms to get improved techniques of solving problems.

Conclusion:

CNN algorithm is good in recognizing the palm image dataset and its classification. which have accuracy of 96.49 % compared to SVM of accuracy 88.70 %.

T-Test

Group Statistics

	algorithm	N	Mean	Std. Deviation	Std. Error Mean
accuracy	CNN	10	98.4960	1.56927	.49625
	SVM	10	88.7040	7.37850	2.33329

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
accuracy	Equal variances assumed	27.344	.000	4.105	18	.001	9.79200	2.38547	4.78031	14.80369
	Equal variances not assumed			4.105	9.813	.002	9.79200	2.38547	4.46304	15.12096