Name : A. Sai Ganesh
Reg no/ Branch: 192111103/CSE
Guide: Dr. Bhuvaneshwari

TITLE: Enhancing Iron deficiency detection Based on palm image by CNN compared to Decision tree.

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 algorithms is one of the procedures that used to detect Iron deficiency. This method is most effective and time efficient.

Introduction:

To determine the effect of Iron deficiency detection using CNN compared to decision tree. CNN is excellent for image classification and cost effective.

paragraph 2:

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

Most cited articles:

* Karsaoglu AR, Polat K, Hasibaeun - Non invasive prediction of hemoglobin level in blood and iron level using machine learning, 2017
* Al-alimi, Bashanfer - prevalence of iron deficiency anemia among university students, 2018
* Pasricha, Tye-Din - Iron deficiency, 2021.
* Dithy, Krishnapriya - Anemia detection in pregnancy women by using random prediction 2019
* Khan, chowdhury - Machine learning algorithm to predict the childhood anemia, 2021

para 4

Applications:

* Early detection and diagnosis
* patient screening
* decision support for health care professionals
* public health
* clinical trials and research
* Remote monitoring

paragraph 3:

Data availability and quality:

Data is collected from hospitals using kobo app and collected patient Hb value, Blood pressure, Blood levels, Gender, age, disease, and uploaded images of Anemic and non-Anemic patients palm.

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 hospitals Comittees and consent of children's parents for taking images of palm are taken into account.

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 both Anemic and non Anemic patients is taken from "Mendeley Data"

paragraph 2:

sample group 1: 10

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:

procedure [Decision tree]

* Defining Problem
* Gathering and preparing data
* Split data and Training and testing sets
* Build a Decision Tree model
* Make prediction
* Evaluate model
* Visualize the decision tree

paragraph 4:

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

Test procedure:

Data collection: Gather the dataset that contain information about Iron deficiency detection.

Model development: Implementing convolutional neural network algorithm and model with test 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	98-49
2.	Decision Tree	10	92.90

paragraph-6:

i) Statistical software used: IBM SPSS version 27

ii) Result and Discussion:

Table 1: It displays the improvement of accuracy of CNN

Table 2: It displays the anticipated accuracy of Decision Tree

Table 3: It provides the accuracy after Decision Tree with CNN using standard error

Table 4: compares the accuracy of decision tree to that of CNN

iii) Independent variables: * CNN
* Decision tree

previous literature

Limitations: Difficult in getting more accuracy with decision tree because of its complex datasets like images without sophisticated feature engineering

Feature scope:

CNN can be combined with Decision tree because other machine learning Algorithm to get improved techniques of solving problems.

Conclusion:

CNN algorithm is good in recognization of palm image dataset and its classification which contains of accuracy 98.49% compared to decision tree of accuracy 92.90 %.

Verified
B. Bhavana

T-Test

Group Statistics

	algorithm	N	Mean	Std. Deviation	Std. Error Mean
accuracy	CNN	10	98.4960	1.56927	.49625
	DECISION TREE	10	92.9060	3.85864	1.22021

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	3.789	.067	4.244	18	.000	5.59000	1.31726	2.82254	8.35746
	Equal variances not assumed			4.244	11.898	.001	5.59000	1.31726	2.71721	8.46279