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TITLE: Optimizing Iron deficiency detection using palm images through comparision of CNN with KNN

Paragraph 1:

Abstract:

Iron deficiency is one of the global public health problems that affects children and pregnant women. The non invasive approach such as machine learning algorithm 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 KNN. CNN is excellent for image classification and cost effective.

paragraph 2:

Total number of articles published on this topic is more than 92 papers from scholars IEEE Explore.

Most cited articles:

* Kanscioglu AR, Polat IC, Hasiharan - Non invasive prediction of hemoglobin level in blood and iron level using machine learning for
* Al-alimi, Bashanfer - prevalence of iron deficiency anemia among University students, 2018
* pasricha, Tye - Div - Iron deficiency, 2021
* Dithy, Krishna priya - Anemia detection in pregnancy women by using random prediction 80%
* Khan, Chowdhury - machine learning algorithm to predict the childhood anemia, 2021,

para 1:

Application:

* 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 various hospitals using robo app which is used to collect Hb value, Blood pressure, Blood level, Gender, Age Anemic and non Anemic palm images were taken from patients

Algorithm and complexity performance:

Before the study began the ethical consent from various hospitals committees and consent of children's parents for taking images of palm are consented.

Feature extraction:

Identifying the most-informant features and optimizing feature extraction method 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 and prepare data
* Split data into training and testing data sets
* Build a CNN model
* Compile the model
* Train model
* Evaluate the model

deploy

paragraph 3:

procedure: [KNN]:

* Define the problem
* Gather and prepare data
* Split data into Training and Testing sets
* Build a KNN model
* Make predictions
* Evaluate the Model
* Finding optimal k

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 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	98.49
2.	KNN	10	94.33

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 display the anticipated accuracy of KNN

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

Table 4: compares the accuracy of KNN to that of CNN

iii) Independent variables: * CNN
* KNN

previous literatures:

Limitations:

Difficult in getting more accuracy with KNN because of sensitive to irrelevant features and high dimensional data: computationally expensive during prediction.

Feature scope:

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

Conclusion:

CNN algorithm is good in recognizing palm images and classification of images which have accuracy of 98.49% compared to KNN of accuracy 94.33 %.

B. Bhanu

T-Test

Group Statistics

	algorithm	N	Mean	Std. Deviation	Std. Error Mean
accuracy	CNN	10	98.4960	1.56927	.49625
	KNN	10	94.3360	4.33549	1.37100

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	11.469	.003	2.853	18	.011	4.16000	1.45805	1.09675	7.22325
	Equal variances not assumed			2.853	11.318	.015	4.16000	1.45805	.96184	7.35816