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

TITLE: Comparitive Analysis of CNN and Naive Bayes Algorithm for Iron deficiency detection

paragraph 1

Abstract:

Iron deficiency is one of the global public health problem that effects children and pregnant women. The non invasive approach such as machine learning algorithms is one of the procedures that used to detecting Iron deficiency. which is most effective and timely results oriented.

Introduction:

To determine the effect of Iron deficiency detection using CNN compared to Naive Bayes. 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 scholar IEEE Explore.

Most cited articles:

* Kavsaoglu AR, Polat K, Hariharan - Non invasive predictor of hemoglobin level using machine learning techniques, 2015
* Al-alimi, Basharfeel - prevalence of iron deficiency anemia among university student in Hodeida, 2018
* Pasricha, Tye-Din - Iron deficiency 2021
* Dithy, krishnapriya - Anemia selector in pregnancy women by using random prediction 2019
* Ichan, Chowdhury - machine learning algorithms to predict the childhood anemia, 2021

para 1:
Applications:

* Early detection and digrosis
* Patient screening
* Decision support for health care professionals
* public health
* clinical trials and research
* Remot monitoring

paragraph 3:

Data availability and quality:

Data is collected from hospitals using Icho called app about patient Hb value, age, Gender, disease and palm images of Anemic and non Anemic patients.

Algorithm Complexity and performance:

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

Ethical consideration:

Before the study began the ethical consent from various hospital committees and consent of children's parents for taking pictures of palm are taken into account.

Feature extraction:

Identifying the most informant features and optimizing features extraction methods for CNN and could be made 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:

Sample group 1: 10

procedure: [CNN]

* importing Libraries
* Data preprocessing
* Model Architecture
* Model compilation
* Model Training
* Model evaluation

i) Define the problem
ii) Gather, prepare data
iii) Split data into Training and Testing sets
iv) Build a CNN model
v) Compile the model
vi) Train the model
vii) Evaluate the model
viii) Deploy

paragraph: 3 [Naive Bayes]

procedure;

i) Define the problem
ii) Gather and prepare data
iii) preprocess Text Data
iv) Split Data into Training and Testing sets.
v) Train a Naive Bayes classifier
vi) Make predictions.
vii) Evaluate the Model
viii) Fine Tune improve
ix) Deploy

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	98.49
2.	Naive Bayes	10	82.66

paragraph-6:

i.) Statistical software used: IBM SPSS version 27

ii.) Independent variables:
* CNN
* Naive Bayes

iii.) Results and Discussion:

Table 1: It displays the improvement of accuracy of CNN

Table 2: It displayes the anticipated accuracy of Naive Bayes

Table 3: provides the accuracy after Naive Bayes with CNN using standard error

Table 4: Compares the accuracy of Naive Bayes to that of CNN

Previous literature:

Limitations: Difficult in getting more accuracy with Naive Bayes because of its independence b/w features, may not capture complex relationships in image

Feature scope:

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

Conclusion:

CNN algorithm is good in recognization of palm image v and image classification which contains 98.49 % dataset of accuracy compared to Naive Bayes of 82.66 % Accuracy.

T-Test

Group Statistics

	algorithm	N	Mean	Std. Deviation	Std. Error Mean
accuracy	CNN	10	98.4960	1.56927	.49625
	NAVIE BAYES	10	82.8860	12.20945	3.86097

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	19.120	.000	4.010	18	.001	15.61000	3.89273	7.43168	23.78832
	Equal variances not assumed			4.010	9.297	.003	15.61000	3.89273	6.84677	24.37323