Fashion Product Classification using Convolutional Neural Networks

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Abstract: **Data mining and deep learning is the most important area in data science. There are many data mining techniques which we are used in our daily life. We used these techniques in education, medicine, weather, business, banking etc. In this paper We discussed the use data science in E – commerce because now days everything going on e-commerce. We discussed about fashion designing fashion product. In this paper we use fashion product data set this dataset contain ten classes like shirt sandal tea shirt sneakers etc. It contains 6000 pics 28*28 pixel and apply Convolutional Neural Network with Keras and find out the classification accuracy.**

Keywords—**Accuracy, Deep Learning, Convolutional Neural Network, Diabetes,** *(Key Words)*

I INTRODUCTION

Deep Learning is most advance area of research data mining techniques have covered all areas of our lives.   We use Deep Learning techniques in our daily life. We used these techniques to get more batter accuracy. We used these techniques in education, medicine, weather, business, banking etc [1].

Issues related to fashion and clothing are an important element of human culture. Nowadays, fashion is also an important part of the economy, including virtual economy on the Internet. Customers expect online stores to provide them with an easy way to find clothes that match their tastes. Therefore, there is a need for high quality clothing search engines. On [2] the other hand, clothing suppliers are not sufficiently prepared to add their products to such search engines because it would require a very accurate, systematic and unified description of their products. Moreover, each store or search engine has a different set of categories and attributes, which is not compatible with others. In order to place a product in a search engine it is necessary to assign it to the appropriate category and apply correct attributes.

Depending on the application, by habit, in general, and especially for distribution through it, something does not provide a solution to the causes of the most appropriate results, we differ. He [3] focuses on fashion optimization after interpreting the picture to invent this special article that is very similar to the ships in the query picture. the difficulties of this work include: garments of these movement classes (e.g., relative to the lower part of the garments on the lower wing),

the garments are not easily deformed due to the material; some types of clothing may be small. and types vary depending on the angle of the garment in these days' fashion designing is more advance area research. We widely used different technique for prediction outcome. Fashion product dataset is containing information related normally used product. A number of tool and technique od machine learning Artificial intelligence which are used in different health care department for different purpose. ANN also an advance datamining technique which are used. Deep Learning is most advance technique which are used for different purpose.

This special purpose is to examine how research works for this citron issue, as this message has been manually tagged to support (or not) the idea of using deep learning to find the accuracy.

This paper explains Convolutional Neural Network with Keras and find out the classification accuracy which apply on fashion-MNIST dataset and find out the accuracy.

II. LITERATURE SURVEY

Many methods that have been applied on MNIST dataset da are explain with its results.

Some researcher used K Nearest neighbor classifier for find the accuracy of MNIST dataset. This technique is give us prediction accuracy of 77% [4] A Class wise KNN(CKNN) technique on dataset was applied after dataset prepressing dataset is improvised K nearest neighbor algorithm. We get beset accuracy of 78.16% [5].

Some researcher applying classifier techniques as weight-adjusted voting technique. This technique after applying on diabetes dataset give accuracy of 77% [6].

Some researcher is used the concept of change is the greatest teaching is supposed to say to a patient with diabetes is set based on the information available machines with MNIST dataset. The deduction is first class and the greatest training classifiers authors of neural networks [7].

Some researcher applying different data mining algorithm used ANN [9]. Some researcher applying that data mining technique they get 85% accuriecy they apply supervised learning technique and 15% by unsupervised ones, and, association rules[8].

A (SVM) is normally and successful used algorithm for this. In [9-10] different classification technique are used for this and get highest accuracy is 86.7%, the classification technique are use are decision tree(J48), random Forest and naïve bays.

III RESERCH QUESTION

In this research paper we apply Convolutional Neural Network classification algorithm on dataset a data set of Fashion product

a) The problem statement is that apply Convolutional Neural Network algorithm on given dataset and find the accuriecy.

IV. METHODOLOGY

There are many are many tools and technique are present in the field which are applied for classification of data. But in this paper we use programming language python and we use kaggle online note book. We apply convolutional neural network (**CNN**) using keras in this plat form and workflow diagram in fig.1

Workflow diagram Fig.I

a) Working

For prediction detection we apply convolutional neural network (**CNN**) technique in python first we run kaggle online and launch note book. After this we import some important libraries like as import numpy as np, import mathplotlib. import Sequential. keras. layers import Dense etc. In next step check the data and show its different attributes by using df. shape function. In next step we used split function for test and train data. Now we apply our classifier algorithm which we want to use like as convolutional neural network (**CNN**) and check the accuracy.

b) Data Access

First step in workflow is to access the file path convolutional neural network (**CNN**) for further implementation.

CLASSIFICATION TECHNIQUES

Classification is supervised learning. In this type of technique data is divided in to predefined label according to their property. Data mining is a very useful and advantageous technique for decision-making. Classification is a simple and broadly used data mining technique. It is necessary to understand the classification

a) Convolutional Neural Network with Keras

Convolutional Neural Network with Keras learning algorithms this type of deep learning technique are used for classification. convolutional neural network (**CNN**) for further implementation. are used where complex problem is want solve. Sometime machine learning did not perform good it did not give us batter result at this place we use deep learning neural network. Keras is best high level neural network. We use different layers of keras for batter result as show in fig 2
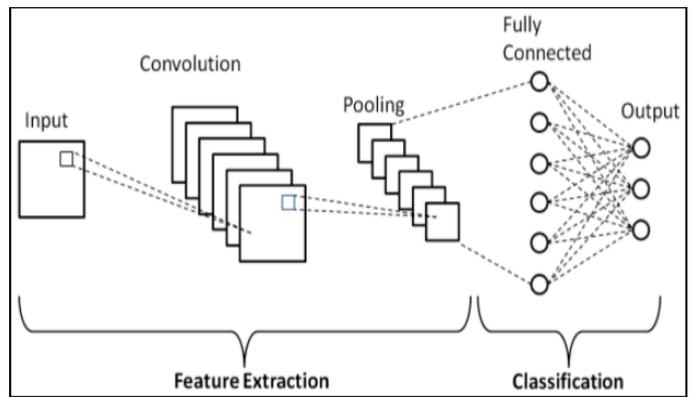
CNN Structure Fig.II

V. EXPERIMENT AND ANALYSIS

I have use the best popular data mining tool for analysis open source tool. We use programming language python and we use online kaggle note book. The fashion-MNIST have used and we apply classification technique and check their result. The analysis has been performing on a Windows 10 operating system with Intel Core i5 CPU, 3.00 GHz Processor and 8.0 GB RAM.

a) Dataset

In this paper I used kaggle website to download dataset of fashion-MNIST. Data set contain different type of dress picture like as T shirt, Dress shirt. Bags, Ankle boot, Sneaker, sandal and Dress etc. Data set detail show blow in fig 3

Dataset Fig III

b) Preprocessing

In this step we take Diabetes dataset from internet in dataset some irrelevant data present and some missing value are present we remove all these irrelevant data and use useful information for future working.

c) Define the keras model

In this step after loading dataset we define our model that we apply on our dataset we use keras model we use its. As show in fig 4

```
model = keras.Sequential([
    keras.layers.Flatten(input_shape=(28, 28)),
    keras.layers.Dense(300, activation='relu'),
    keras.layers.Dense(80)
])
```

Keras model Fig IV

d) Compile the keras model

After define keras model we compile our model. The most important part in this step apply keras optimizer and we use Adam optimizer in this paper as show in fig 5.

```
model.compile(optimizer='adam',
        loss=tf.keras.losses.SparseCategoricalCrossentropy(from_logits=True),
        metrics=['accuracy'])
```

Compile Model Fig V

e) Fit the keras model on the dataset

In this step we train our model on our train data set. The most important steps are to select number of epochs and batch size. Because our training accuracy depend on these two steps. In our paper we take number of epochs 200 and batch size 50 as show blew in fig 6

```
model.fit(train_images, train_labels, epochs=100)

Epoch 1/100
1875/1875 [==============================] - 4s 2ms/step - loss: 0.4975 - accuracy:
0.8260
Epoch 2/100
1875/1875 [==============================] - 4s 2ms/step - loss: 0.3677 - accuracy:
0.8658
Epoch 3/100
1875/1875 [==============================] - 4s 2ms/step - loss: 0.3330 - accuracy:
0.8777
Epoch 4/100
1875/1875 [==============================] - 4s 2ms/step - loss: 0.3063 - accuracy:
0.8864
Epoch 5/100
1875/1875 [==============================] - 4s 2ms/step - loss: 0.2874 - accuracy:
0.8948
```

Tran Dataset Fig VI

f) Evaluate the keras model

At last step we apply our model on our testing dataset and get accuracy. We apply our model on testing part and get 89.27 % accuracy that are very good result as show blow in fig 7

```
test_loss, test_acc = model.evaluate(test_images,  test_labels, verbose=3)

print('\nTest accuracy:', test_acc)

Test accuracy: 0.8927000164985657
```

Result on Test Dataset Fig VII

VI. RESULTS AND DISCUSSION

In this paper we used fashion-MNIST dataset which download from internet and we apply convolutional neural network (**CNN**) using keras. We apply our model on fashion-MNIST dataset before my work a lot of researcher work on it using machine learning algorithm or ANN etc. butt we apply deep learning algorithm on it it gives highest accuracy. For practical work we use programing language python we apply these techniques on kaggle note book. We apply convolutional neural network (**CNN**) keras it is more advance deep learning algorithm. We use 200 no of iteration and batch size 50 and check accuracy it gives us 89.27% accuracy The result is show in table 1. The result that we get to apply algorithm is much batter results.

Result Table I

Algorithm	Data Set	Batch Size	No. of iteration	Accuracy
convolutional neural network (**CNN**)	Fashion-MNIST	50	200	89.27%

VII. CONCLUSIONS

Deep learning is the most important part of data science. It used in every field of life. In every field we used different technique of data mining like as classification, clustering and prediction. we used these techniques in education medical, business and banking etc. In this paper we apply deep learning algorithm on fashion-MNIST data set that take from internet Kaggle sit. We get accuracy Fashion-MNIST We apply these techniques on kaggle note book. For practical work we use programing language python we apply these techniques on kaggle note book. We apply deep learning neural network using keras it is more advance deep learning algorithm. We use no of iteration 200 and batch size 50 and check accuracy it gives us 89.27% accuracy. The result that we get to apply algorithm is much better results.

VIII. SUGGESTIONS AND FUTURE PLAN

In feature we apply more than one algorithms on this data set and improve accuracy We also change data set and applying different algorithms.

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