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**An Efficient Working Employee Performance Prediction using DenseNet Compared Over ANN with Improved Accuracy.**

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**ABSTRACT**

**Aim:** The main goal of this experimental study is to improve the accuracy value of a working person’s performance forecasting with an online Kaggle dataset using various DL (Deep Learning) models like DenseNet and ANN(Artificial Neural Network). **Introduction:** The various problems that typical methods have with their high false predictable rate, relatively fewer accuracy data, and low generalization capability are caused by the diversifying of the working individual’s performance predictable system**. Materials and Methods:** The developed model was given to enhance the accuracy value from the working public Kaggle online dataset using DenseNet and ANN. The online working people dataset is applied for an experimental stage, and the developed model is processed with the support of a python programming tool. **Results and Discussion:** The outcome of the implemented working people performance forecasting system is assessed. The designed prediction model using DenseNet and ANN model’s classification accuracy rate is confirmed with 91.60%. DenseNet and ANN processing time is also calculated as 0.5 seconds. **Conclusion:** The outcome of this recommended research process result says that it is finalized that the DenseNet model makes better outcomes in employee performance prediction from the online dataset than the ANN classifier.

**Keywords:** Employee Dataset, DenseNet, ANN, Accuracy Value, Python Programming, Prediction, Forecasting

**INTRODUCTION**

The growth of a company depends on employee effectiveness in achieving its objectives. Future individual employee forecasting is essential for businesses to succeed [1]. All firm, regardless of size, benefits from having employees. It is essential to understand an individual's value to keep the performance of the worker and expertise level [2]. Most organizations and businesses have a systematic procedure in place for evaluating employees, which is often done once or twice each year. An organization can gain significantly from a strong performance assessment system [3].

Over the past 5 years, nearly 300 research magazines were available on GS (Google Scholar) and more than 150 research magazines were offered in science-direct research journals with various DL concepts. Numerous publications on employee performance prediction using ML and DL methods have been published recently. Because of the rising likelihood of predicting employee performance prediction, current research utilizes cutting-edge IT techniques like DL algorithms, which can be used to predict working people's performance from the employee’s online dataset.

Predicting is a numerical approach for estimating upcoming data that incorporates data from the past. It is a conclusion drawn from the data and facts. Performance evaluation values are derived yearly by the HR department in any organization using a variety of metrics and inputs. A record of worker performance information utilized for forecasting is created [6]. The implementation of AI has an influence on an industry's decision-taken processes in several sectors within organizations [12,13]. The caliber and talents of workers are a positive factor and a true competitive benefit for businesses, therefore HR) has received more notice recently [14].

To predict the performance in the employee dataset, this experimental study suggests a unique prediction model using DenseNet and ANN.

**MATERIALS AND METHODS**

This recommended research task was implemented at the DL(Deep Learning) Laboratory, Saveetha School of Engineering, SIMATS (Saveetha Institute of Medical and Technical Sciences). This developed working personality prediction model consists of two types of groups Group 1 is taken as DenseNet and ANN are computed many times by 150 sample sizes. After gathering the worker dataset from an online Kaggle site, repetitive and unwanted data from the dataset were retrieved during the data pre-processing approaches. Then, it is associated with the applicable data sets, and the accuracy value of the DenseNet and ANN is measured and evaluated.

The enterprise working people’s online dataset is collected and applied in this research study on a trial basis. It uses Python programming for making a performance forecasting model in the online Kaggle employee dataset. Among various software tools, Python software is one of the common tools for creating and evaluating the outcome of DL models. It contains a huge number of library built-in functions and various tools that are used for whole processes associated with the DL classifiers

**DenseNet**

Every layer inside the network is intrinsically linked with every other type of layer, which is the foundation of DenseNets. Every layer receives input value from across all earlier levels and transmits its attribute to all succeeding layers to maintain the FF(feed-forward) nature[8]. Several distinct datasets have been subjected to DenseNet analysis. There are various kinds of dense-type components utilized, depending on the input dimensionality[9].

DenseNet was created primarily to enhance the decreased efficiency brought on by high-level NNs' loss of functionality. In plainer terms, the data disappears before getting there because of the lengthier journey between the layers of input and output. One of the most recent advancements in NN  for visual object detection is DenseNet. ResNet and DenseNet are fairly similar, however, there are several key distinctions. Because although DenseNet inserts (.) the output of the preceding stage with the result of the subsequent layer, ResNet utilizes a correct technique (+) that combines the earlier layer with the subsequent layer[10].

**ANN**

Here this research article illustrates how ANN modeling can be used to build working groups educationally; nevertheless, it is also thought to be useful in the business community. Since the network weights are adjusted by procedures, ANN modeling, which has built-in capabilities and the flexibility to adapt to unfamiliar sets of data, enables the system to forecast the outcome with a minimum amount of error. The signal is passed among neurons in a hidden state of the ANN nodes, which computes the weight value of the signals. The input data is handled in the ANN nodes. Tests and mistakes were used to determine the unseen layer's number of neurons, and in this instance, the output level is described by the performance of the team[7].

**STATISTICAL ANALYSIS**

Statistical software tool IBM SPSS with the familiar version 26.0 to recognize the value of SD (Standard Deviation), mean deviation data, significance point data and also drawing the graphical demonstrations, etc. The SPSS tool was inclined in the current research process for investigating the concerned working people's performance online dataset. Group statistics practice and self-determining sample tests were directed at the experimental outcomes and the visual design was created for two different graphs with two various kinds of features under the specific investigational phase.

Datasets for training and testing are preferred for the online Kaggle employee dataset. The training dataset is recognized by reclaiming the test dataset from the real dataset as long as 400 records as a whole.

**RESULTS**

MATLAB software tool is used to observe the online employee Kaggle dataset and the accuracy value is measured among DenseNet and ANN network systems. For the given datasets, the proposed DenseNet offers more accuracy rate than the ANN. The accuracy value of the DenseNet and ANN is illustrated in Table 3. DenseNet and ANN classifiers' accuracy rates are 91.60 percent and 87.90 percent. Table 4 illustrates group statistics depending on the online working people Kaggle dataset of the developed research work.

# DISCUSSION

The ANN classifier is used in the earlier research work; with a mean rate value of accuracy, the rate is 87.90 %. DenseNet is developed, which has a mean accuracy value is 91.60 %.

Performance evaluation forecasting in a corporation using ML  was presented by Riyanto Jayadi et al., 2019. The forecasting model is constructed using the NB(Naive Bayes) technique. The outcome demonstrates that NB properly identified situations in as many as 95.48 % of the cases[1]. Ananya Sarker et al. (2018) demonstrate how the data classification model can be used to improve staff performance and decision-making. Several measuring performance characteristics, including attitude, timeliness, oral communication tact, etc., have been researched. The outcome of this study makes predictions about the number of employees who will be designated for elevation or fired based on their results. This study provides a reasonably simple approach that may be used to identify unproductive workers, quantify losses, and assist reduce them [3].

N. Magesh et al (2013) .'s study focuses on gathering information about workers, creating a DT from past data, evaluating the DT with an individual's traits, and determining whether to either offer promotions or not. To use the graphical interface, data on a worker are gathered. The training data kept in the DT is matched to this knowledge. Whether or not a worker will receive an annual promotion or raise is the ultimate objective node [5].

In P. Sujatha et al., 2021, the implementation of several ML classifiers, including SVM, KNN, DT, RF, and LR(Logistic Regression), is focused on making the most accurate forecast of a worker's performance The effectiveness of the predictor is assessed using assessment measures like accuracy, reliability, F1-score, and logarithmic loss. According to the research observations, RF offers superior correctness (88%), a better F1 score (0.93), a higher score of precision (0.88), and a reduced log loss (0.33). Hence, compared to other models, the RF model is more accurate at forecasting employee productivity using the provided data set [6].

The purpose of M.B. Shet et al., 2021 is to make predictions about whether or not a company's employee will depart. The primary purpose of the research was to gauge worker unhappiness and determine why they would choose to switch employment. The organization can take action following the observed worker unhappiness element(s) and potentially lower the turnover rate. This development's foundation is the development of a system that forecasts staff turnover using data from the Worker dataset on the GitHub website [11].

C**ONCLUSION**

The DenseNet and ANN used in this study offer a better method for identifying and predicting the performance of working people.

When compared to the ANN classifier, the recommended DenseNet generates a better result with an accuracy value is 91.60 percent. The necessary execution time takes place in a quicker stage of 0.5 seconds

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The accuracy of Dense net is 95.8 and ANN is 94.0

