Reinforced Plastics
ISSN: 0034-3617

AN OPTIMIZED NEURAL NETWORK MODEL FOR PLACEMENT RECRUITMENT ANALYSIS

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***Abstract*—** Recently, the usage of internet is increased and the web to do different things like booking, scholarly search, blogging, apply for any work, and so on This framework can be utilized as an application to oversee student data to related arrangement. The framework handles student just as organization information and productively shows this information to individual sides. This Framework accomplish all work in regards to situation like gathering student records, authenticate and initiate the student profiles, Notifying qualified student by means of automatic E-mail message, Check the number and level of set and unplaced student. Placement recruitment process performed with neural network based optimization algorithm. Here the feed forward neural network with artificial fish swarm optimization algorithm is used. The significant feature takes the experience of candidate and higher secondary mark for better recruitment process. This approach uses the ANOVA with Chi square calculation for better analysis, which uses the MATLAB 2020a tool.

Keywords-Artificial fish swarm optimization; Neural Network; Placement recruitment; Chi square test; ANOVA;

I. INTRODUCTION

The achievement of advanced education is estimated in former times by deciding the degree of information and abilities the students acquired during that period. However, as time progress, the marvels of globalization and huge amount of occupation creation in Information Technology ventures changed the situation so that new model of advanced education is seen which comprises of giving grounds position as a last piece of their advanced education administration. As of late, giving grounds arrangement to effective student is considered as institutional commitment and organizations are positioned dependent on number of occupation situation gave in the grounds to a given year alongside the normal compensation advertised. However, as time progress, the model of grounds arrangement will change and it is anticipated that businesses are considering embracing new model of position through on the web. Enrollment requires employing the most noteworthy like workforce, yet in addition meeting other hierarchical targets. For instance, there is a need to fulfill the need for representatives in various divisions, the help of variety in groups and the portion of the labor force among various offices in a fair way. Cuckoo search analysis based placement recruitment process is initiated [1].

Every one of these measurements may likewise incorporate various perspectives: the neighborhood perspective of each position, the positional perspective and the authoritative or administrative perspective. Neural network based job selection is performed in [2]. Neighborhood enhancement procedures will show

early intermingling to nearby optima, which are viewed as quicker than global optimization strategies. Machine learning, statistical analysis and other mathematical programming techniques were used for placement selection process [3]. The association additionally can go for private business offices who take every one of the duties of creating a Pool of possibility for enlistment as per the association's requirements. Ant colony optimization and other swarm intelligence based approaches are used for student selection process [4]&[5]. The organizations create the candidate pool what's more, do the fundamental meetings, in this way screening out unfit candidates and afterward send really qualified possibility to the association and that is likewise by using position standards given by the actual association. Neural network and other machine learning approaches are performed in [6]. The recruitment process uses the fisher information based optimization [7]. The framework additionally comprises of an organization login where different organizations visiting the institute can see a rundown of student around there and furthermore their separate resumes. Campus recruitment system with automated performance is presented in [8]&[9]. Nonetheless, the private work offices can be expensive subsequently few out of every odd association can bear the expense. Harmony search optimization is presented in [10].

Global optimization techniques then handle multimodal target capacities furthermore, will in general investigate the arrangement space trying to discover global optimization. A traditional fish schooling optimization is studied in [11]. In student placement interaction, Students are chosen on merit also, information premise on the distributed rules that changes as per diverse arrangement boards. Artificial neural model with back propagation and feed forward neural networks are reviewed in [12]. Position advisory groups guarantee that all through the selection process and candidates are treated with courtesy. Genetic algorithm, artificial fish schooling, artificial bee colony, bio inspired approaches etc are reviewed for ths application [13] to [16]. Section models and application methods are excessively distributed on the establishment's site for the data of students and those trying to work with the association [17]. ACO depends on insect's conduct of optimization algorithm. ACO points to look for an ideally best way in guaranteed arrangement as particle look for a best way between their settlement and food source. ACO can without much of a stretch address wide scope of mathematical and complex issues. PSO was at first expected to reproduce social conduct. PSO is a computational technique utilized for issue enhancement by constantly improving a up-and-comer arrangement regarding a given quality measure. The metaheuristic approaches are look for global optimization and consequently for tackling the well position advancement issues introduced in our investigation.

Major objective of this approach is increase the available and effective attribute to select the student using novel optimization algorithm. The student selection process is organized to provide the job based on the skills and experience. For this various machine learning and optimization algorithms are used. In this proposed work, the neural network analysis of feed forward neural network based classification and fish swarm optimization is applied to recruit the students for IT jobs. Here two main attributes were selected to optimize the student counts that are experience and high secondary marks.

This paper organized as follows. Section II describes the literature survey of various papers related to the topic. Section III presented the proposed work study and calculative analysis. This also describes the proposed algorithms. Section IV presents the results of calculation and analysis cases and discussion about study and calculative analysis. Section V concludes the proposed placement recruitment process. Finally, future scope analysis of proposed study is discussed.

II. LITERATURE SURVEY

Nedhal AI-Saiyd, Amjad S AI-Takrouri, (2015) has presented the IT job prediction using back

propagation based neural network model. To accomplish the undertaking result, informational indexes were taken from 50 graduated students. The issues with talking and choice of graduated understudies to work and possess the correct occupation as indicated by their capabilities, actually presents an extraordinary test for business association, and IT organizations. There are a few techniques by which one can anticipate the suitable occupation that is able to individual's abilities; however none of them is very exact. ANN is used for this application. This examination researches how IT occupations are changes concerning the abilities and encounters, information on the graduated students circumstances utilizing ANN.

Dana P, et al. (2020) has presented the employees recruitment process using machine learning approaches. In this paper, we propose a thorough examination system that can fill in as a decision support for HR in true settings to improve employing and situation choices. The system follows two primary stages: a nearby expectation plot for enrollments' prosperity at the level of a solitary occupation situation, and a numerical model that gives worldwide enlistment advancement conspire for the association, considering staggered contemplations. In the principal stage, a critical property of the proposed forecast approach is the interpretability of the AI model, which for this situation is gotten by applying the Variable-Order Bayesian Network model to the enrollment information. In particular, we utilized an interestingly enormous dataset that contains enlistment records of a huge number of representatives longer than 10 years and addresses a wide scope of heterogeneous populations.

Reetika N, et al. (2014) has presented the swarm optimization based recruitment selection process. Countless applications have been proposed utilizing swarm knowledge for various exploration region, for example, ACO, honey bee optimizer, particle swarm, bacterial searching advancement, CSO and some more. In this paper, presentation of multitude knowledge, its variations insect state improvement and PSO, and understudy determination measure has been given. Further, execution of Student Selection Procedure, it is a normalized interaction directed to give occupations to student inside instructive establishments or in a typical occupation reasonable is utilizing insect state advancement and particle swarm enhancement.

Pothuganti M, Neelam S, (2019) has presented the random forest, and decision tree for placement recruitment process. This model is proposed with a calculation to foresee the equivalent. Information relating to the examination were gathered structure the same establishment for which the arrangement expectation is finished and furthermore reasonable information pre-handling techniques were applied. This proposed model is additionally contrasted and other customary arrangement calculations, for example, Decision tree and Random woods regarding exactness, accuracy and review. From the results got it is tracked down that the proposed calculation performs altogether better in examination with the other calculations referenced.

M Amaleeshwari, et al. (2017). Automation Process in Campus Enrollment System of the institute is performed. This framework is utilized to acquire the data of all the organizations to work with students and plan for the situation. The utilization of Cell phones, Internet and World Wide reformed the arrangement of data also, the convenience for the client to take the data and get the organization association exercises. Automation of manual working of framework is favorable since automation gives quicker execution of work then physically working framework and mistakes are additionally decreased. Since, in physically working framework human endeavors are incorporated which may cause mistakes also, lessen the speed.

Rajnish T, et al. (2018) has reviewed the campus recruitment process for placement selection system. Placement recruitment targets giving the similarity to work on the interaction of placement for

students. This framework that comprises of an student login, organization login and an administrator login. This is valuable for undergrads, different organizations visiting the grounds for enrollment and surprisingly the institute position official. The product framework permits the students to create their profiles and transfer every one of their information counting their imprints onto the framework. The administrator can check every student profile and can eliminate defective accounts. The product framework permits students to see a rundown of organizations who have posted for opportunity.

III. PROPOSED METHOD

Here the neural network model is used in ideal way of recruitment selection, which utilizes the two significant attributes that are experience and higher secondary marks. From this viewpoint, these calculations are utilized to choose the ideal component of student data and inclinations for ANN. The ANN come in structures of feed forward neural network (FFNN), which is made out of three layers, each containing a bunch of hubs. These hubs are called artificial neurons. All neurons in one layer are interconnected with all ANs in the following layer, except for the primary layer whose hubs are too associated with the feature set. As of late, large numbers of the scientists have utilized a heuristic calculation to preparing the neural organizations. Furthermore, supplanted the customary calculation with the heuristic calculation showed preferred outcomes over the existing optimization.

A. Dataset

The placement recruitment process is based on the student profile and the objective parameters, which are selected by Optimized neural network model using FFNN and AFSO algorithm. Here the dataset is collected from https://www.kaggle.com/benroshan/factors-affecting-campus-placement .

In this, the 15 column dataset with marks, salary, experience, extra skills, salary offer, written test performance, etc these are predicting the single class value of output. The data handling progression with two fundamental segments: specific restraint of errand insignificant movement and hierarchical enrollment of assignment significant action.

B. Placement recruitment from campus interview

Organization can enlist with the institute. In organization module contact data, URL, Papers, opportunities will be given. Organization can perceive the number of students are qualified dependent on the measures gave. Organization can take criticism from placement officer. After recruitment measure is conveyed, the following significant interaction is the selection process. Determination is the way toward putting right men on right work. It is a method of coordinating with organizational necessities with the abilities and capabilities of individuals Enrollment is considered to be a positive cycle as it rouses a greater amount of contender to go after the position. They can contact with the organization and can get some information about organization. They can take criticism and can see filled input given by graduated class. Web based Training and Placement framework automates exercises of Training and arrangement cell furthermore, places the best coordination between students. It gives the student local area to utilize aggregate knowledge to build the determination proportion and facilitates out the interaction of formation of the executives data consequently. Web based training and placement centers around the arrangement.

C. Artificial Fish Swarm Optimization algorithm

In AFSO, objective is to track down the briefest way of cross all the given universities for best student determination in least time. Given arrangement space is the assortment of universities to be navigated and arrangement advisory groups address specialists to

carry out the calculation. Boundary that specialists use for choice is the information and characteristics of student of particular institute. The feature parameter of determination with most extreme number student inside least time addresses the most brief determination way, that is, ideal outcome in best least time. The fish swarm optimizer has different behaviors of selection that are random behavior, searching behavior, swarming behavior, chasing behavior and leaping behavior.

The Artificial fish swarm optimization is utilized as new preparing technique for feed-forward neural network and the proposed strategy is tried regarding arrangement exactness on a placement based student datasets. The proposed strategy depends on the two calculations in the field of multitude insight, which are utilized as the new preparing technique for neural network to beat the inadequacy in the conventional preparing calculations and get a high grouping exactness.

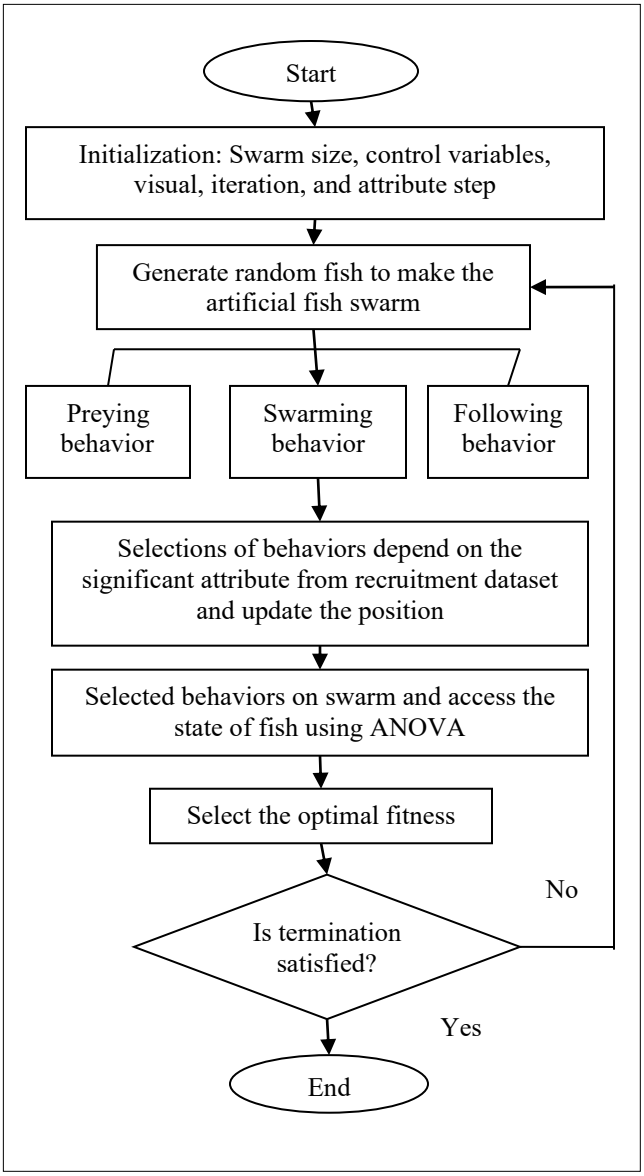

Figure 1. Flow diagram of artificial fish swarm optimization

From this flow chart (see figure1) the AFSO is described as follows. Prey: The fish sees the convergence of food in water to decide the development by vision or sense and afterward picks the propensity. Multitude: The fish will amass in bunches normally in the moving interaction, which is a sort of living propensities to ensure the presence of the state and keep away from threats. Follow: In the moving interaction of the fish swarm, when a solitary fish or a few fish discover food, the local accomplices will trail and arrive at the food. The AFSO algorithm

helps to choose significant feature set. The optimization approach is utilized to choose the ideal element of student data and predispositions for feed forward neural network.

D. Neural network model

Classification measure is perhaps the main tasks carried out on the data processing system to arrange the information. Accessibility of student's data measures of information expanded the requirement for compelling strategies to dissect and group information precisely. The principle objective of this approach is to construe on the suitable upsides, all things considered to decrease the error rate in FFNNs. Other than this, it is conceivable that a preparation calculation is applied to a FFNN with the end goal of surmising on the best construction for some issues, which is made by controlling the associations between neurons, the number of covered up layers and the quantity of hubs in layers of the FFNN (see figure 2).

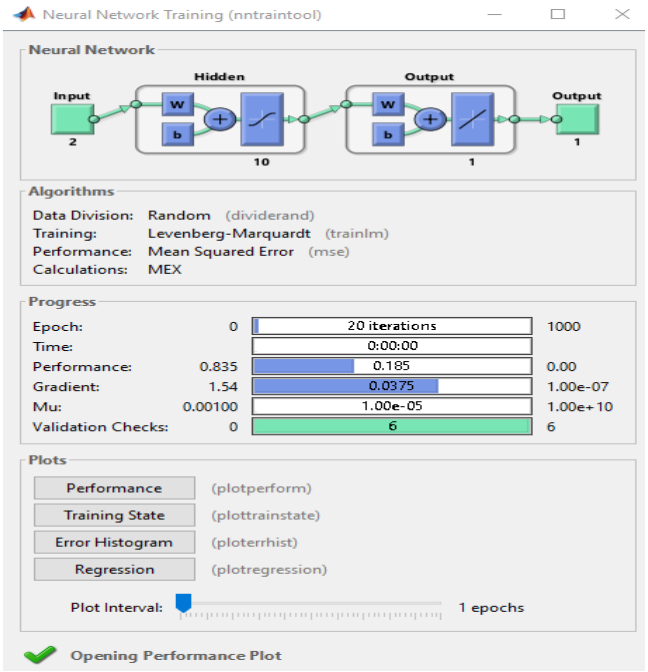

Figure 2. FFNN in placement selection process

Heuristic calculations can be applied on three viewpoints to improve the presentation of FFNNs. These strategies attempt to discover a mix of loads and inclinations, find a legitimate construction for a FFNN and utilize developmental calculation to tune the boundaries. When utilizing ANN the initial step that should be completed is to decide the fixed design of the ANN, which is later on prepared by the learning calculation.

IV. RESULTS AND DISCUSSION

Here the AFSO algorithm with neural network based class expectation is finished with the ANOVA. The chi square test is finished with the p esteem value, which assists with recognizing the ideal capacity of given information base. This proposed research work used the improvement approach with feature determination by feed forward neural organization model. From this, the data set choice, prevailing variable finding, and choosing the ideal worth with viable focuses are the central point to decided on placement selection process.

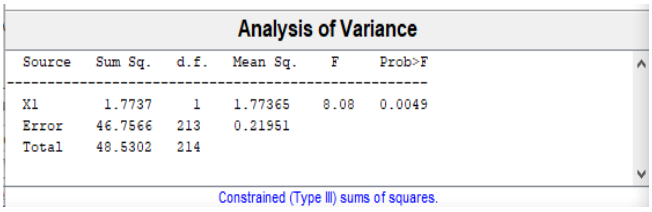

Figure 3. Chi square test report of secondary board

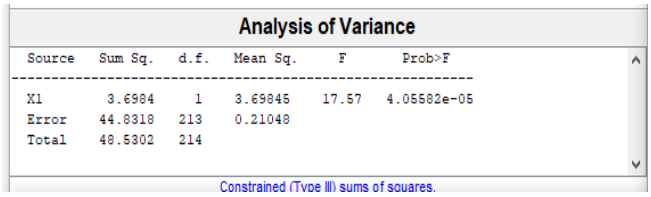

Figure 4. Chi square test report of higher secondary percentage

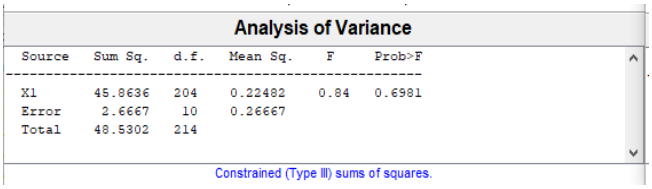

Figure 5. Chi square evaluation of PG specialization

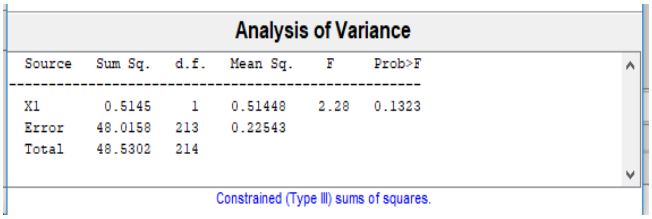

Figure 6. Chi square test evaluation of work experience

The chi square test reports of individual attributes are given in figure 3 to figure 6. Analysis of variance (ANOVA) is a factual procedure that is utilized to check if the methods for at least two featured placement data are altogether not quite the same as one another. ANOVA checks the effect of at least one element by contrasting the methods for various examples. Mean square report of training state in neural network model is given in figure 7.

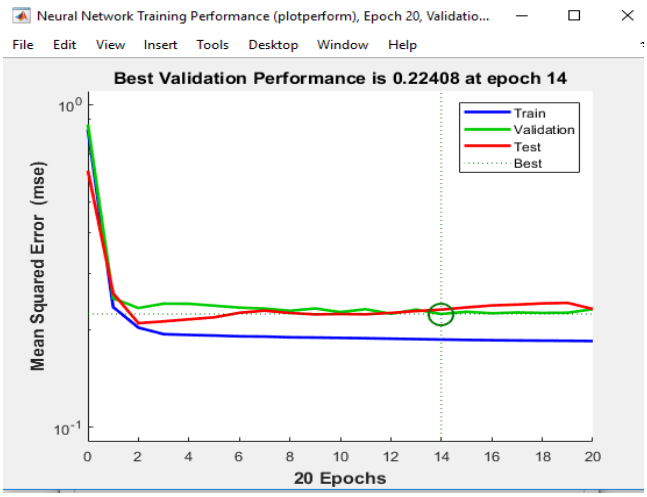

Figure7. Simulation result of mean square error

Hypothesis that you may have concentrated in insights, ANOVA likewise utilizes a Null theory and an Alternate hypothesis. The Null hypothesis in ANOVA is legitimate when all the feature data are equivalent, or they don't have any huge distinction. Then again, the statistical placement data is legitimate when at any rate one of the feature data is not the same as the remainder of the samples.

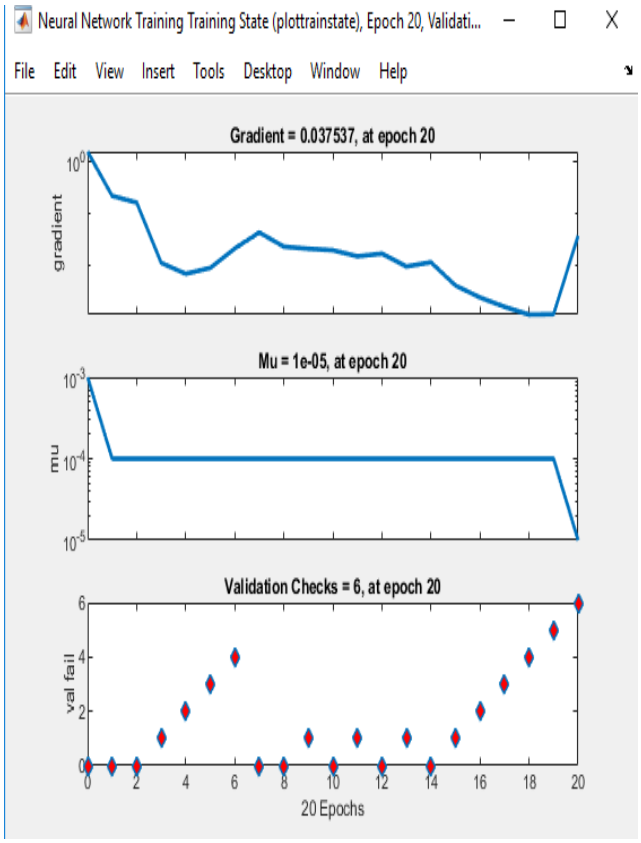

Figure 8. Performance on optimizer states

The training state validation is given in figure 8. Point of each higher instructive organization is to get their student with compensated occupation through their arrangement cell. Regression of FFNN is given in figure 9. The situation expectation is extra convoluted once the nature of instructional elements increment.

One of the viable approaches to address the challenges for improving the quality is to give new information identified with the instructive cycles and elements to the administrative framework. Student placement predictor is a framework which predicts student position status utilizing ANN with AFSO methods. Error histogram result is shown in figure 10.

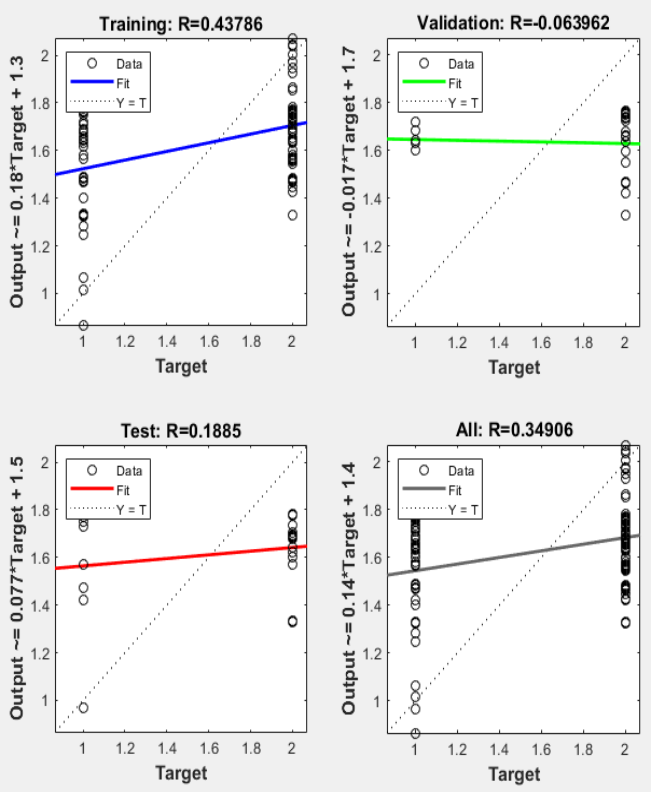

Figure 9. Simulated result of optimized neural network regression

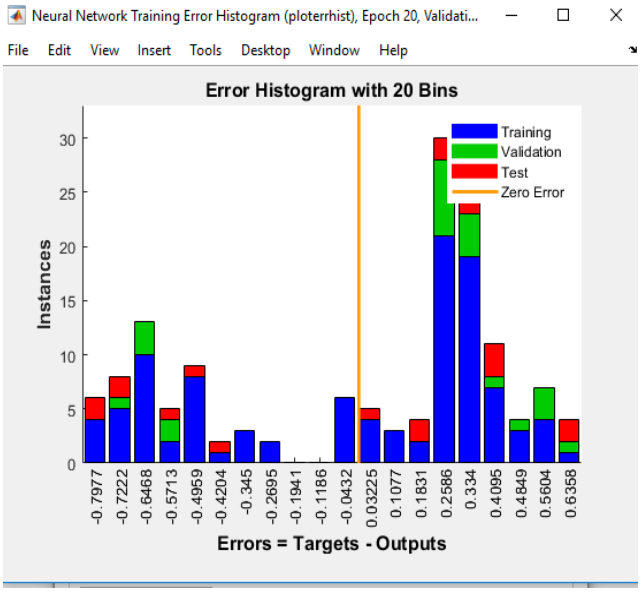

Fig10. Result of Error Histogram

The dataset is gathered from different wellsprings of situation dataset like pages of instructive establishments, corporate, consultancies, and analysts and so forth this examination zeroing in on the new patterns, and issues and this inspected to spur the contender to improve abilities, choosing definite area and going to courageous meet.

Table1: Comparison result

Existing work 1			
Parameter	**Chi-square statistic**	**p-value**	**significant at p**
H10	494.2949.	< 0.00001	p < .10
H20	226.4665	< 0.00001	p < .01
H30	20.5428	< 0.00001	p < .01
Existing work 2			
Parameter	**Chi-square statistic**	**p-value**	**significant at p**
H10	3.3372	<0.0001	P<.01
H20	3.7111	<0.0001	P<0.01
H30	10.5127	<0.0001	P<0.11
H40	8.6854	<0.0001	P<0.001
Proposed work			
Parameter	**Chi-square statistic**	**p-value**	**significant at p**
H10	3.2112	<0.001	P<.01
H20	3.1556	<0.001	P<0.01
H30	8.5462	<0.001	P<0.11
H40	7.9822	<0.001	P<0.0001

The comparison result shows the better performance of p value (see table 1). This examination is finished by Chi Square Test estimations. Relies upon the gathered information, the examination report shows the result, which assists with breaking down the different survey investigation of position enrollment measure in instructive foundations.

V. CONCLUSION

ANN models are compelling in selection process of placement on educational institution. To test the adequacy of the created ANN models, coefficient of assurance and probability work that limits the root mean squared mistake were utilized. The database selects the 15 column of student profile for placement selection process by selecting 2 to 14 columns for input data. This research contributes to various companies and organization takes their decision automatically by this method and also increases the availability of various applications based on this work. SI has been widely utilized in research territory since swarm frameworks are profoundly versatile, react well to quickly evolving conditions, work by and large without focal control and comprises of basic specialists or particles. This proposed work uses the artificial fish swarm optimization algorithm improves the performance than existing models.

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