



PREDICTING ONLINE RUMMY GAME MENTAL DISORDER CAUSED IN YOUNGSTERS USING DBN COMPARED OVER DECISION TREES WITH IMPROVED ACCURACY.

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Abstract:

Aim: Predicting online rummy game mental disorder caused in youngsters using Deep belief network compared over decision tree with improved accuracy.

Materials and Methods: The Deep belief network (N=10) and decision tree Algorithm (N=10) these two algorithms are calculated by using 2 Groups and I have taken 20 samples for both algorithm and accuracy in this work.

Results: Based on the Results Accuracy obtained in terms of accuracy is identified by Deep belief network algorithm (65.3%) over decision tree algorithm (75.9%). Statistical significance difference between Deep belief network algorithm and decision tree Algorithm was found to be 0.220 ($p < 0.05$).

Conclusion: The Prediction online rummy game mental disorder caused in youngsters using Deep belief network when compared with decision tree algorithm.

Keywords: Online Rummy Game, Deep Belief Network Algorithm, Decision Tree, Classification Machine Learning.

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1. Introduction

Wretchedness is the most steady type of psychopathology which influences one's perspective, conduct, and feel. It causes delayed sensations of misery and trouble (Sharma, Mantri, and Dua 2018). Sorrow is unique in relation to intermittent temperament swings or being vexed, which are for a couple of days to years. The justification for an individual to experience the ill effects of wretchedness is disputable, and the accessible medicines are insufficient for some patients ("Website," n.d.). In one of the clinical preliminaries star d it is recorded that as it were one-fourth of the patients impacted with sadness showed improvement as a result of its undercover heterogeneous nature (Jardri et al. 2012). As per who, it is assessed that 57 million individuals who are 18% of the worldwide gauge from India are casualties of wretchedness (Bui, Charney, and Baker 2019). Worldwide insights show that around 4.4% of the all out populace are impacted by misery, and it is found normal in females . In view of the DSM-5 scale, there are nine indications of discouragement among, which, if the person shows at least five indications from nine, and afterward he/she would be viewed as discouraged. Additionally, in those five, something like one ought to lose interest or discouraged mind-set (World Health Organization 2009). When there is a solid, extraordinary and durable sensation of gloom, then, at that point, it is announced as Major Depressive Disorder MDD. DSM (Diagnostic and Statistical Manual of Mental Disorders) is an instructional booklet, which gives a normal norm for grouping mental issues in view of oneself revealed appraisals. There are many elements for MDD; critical variables are stress, hereditary qualities, biochemical responses, and hormonal irregularity. The three pieces of the cerebrum that play a fundamental job in MDD are Hippocampus, Amygdala, and prefrontal cortex (Fried et al. 2014).

In Last 5 years 2017-2021 the Google Scholar has published more than 196 papers and the IEEE published more than 200 papers about online rummy games. The analysis of Deep belief network Algorithm and decision tree Algorithm in high performance efficiency has been made using an experimental approach. My study opinion is the efficient prediction of online rummy games using a compershive of the decision tree Algorithm.

The Accuracy of existing research is not properly existing in the system. The existence of the experiment is totally and the improvement of accuracy of a proposed algorithm system compared the existing model by improving. To overcome these issues a decision tree algorithm is

implemented to improve online rummy games by comparing the proposed one with a Deep belief network Algorithm. Our team has extensive knowledge and research experience that has translated into high quality publications (Pandiyana et al. 2022; Yaashikaa, Devi, and Kumar 2022; Venu et al. 2022; Kumar et al. 2022; Nagaraju et al. 2022; Karpagam et al. 2022; Baraneedharan et al. 2022; Whangchai et al. 2022; Nagarajan et al. 2022; Deena et al. 2022)

Now by the Above two Machine Algorithms that we have taken their own Advantages and Disadvantages in the Current survey (Mcewen and Lupien 2002) . On applying Deep belief network Algorithm Memory to the Dataset followed by Performing Observations using decision tree and the results were plotted on a graph then there two techniques are compared based on the Result. Finally getting the best algorithm for predicting.

2. Materials and Methods

The research work is carried out in the Machine Learning laboratory lab at Saveetha School of Engineering, Saveetha Institute of Medical and Technical Sciences, Chennai. The sample size has been calculated using the GPower software by comparing both of the controllers in Supervised learning . Two numbers of groups are selected for comparing the process and their result. In each group, 10 sets of samples and 20 samples in total are selected for this work. The pre-test power value is calculated using GPower 3.1 software (g power setting parameters: statistical test difference between two independent means, $\alpha=0.05$, power=0.80, Two algorithms (Deep belief network Algorithm and decision tree Algorithm) are implemented using Technical Analysis software. In this work, no human and animal samples were used so no ethical approval is required.

The data in this dataset explains about the online game predictions performed in different websites attended using game prediction.com by keeping threshold 0.05 and G power 80%, confidence interval 95% and enrollment ratio as 1. In this dataset we have information about online game about total prediction in websites The first format provides information about the Types of items and. The second format provides information about sales in a company . The statistical comparison of the online game prediction using two sample groups was done through SPSS version 21.0. Analysis was done for mean, standard deviation, independent sample T-test. The dataset named ONLINE GAME is downloaded from google <https://archive.ics.uci.edu/ml/datasets/Abcsicisic+A cid+Signaling+Network>

Deep Belief Network Algorithm

In AI, a profound conviction network is a generative graphical model, or on the other hand a class of profound neural organization, made out of numerous layers of dormant factors, with associations between the layers however not between units inside each layer.

Pseudocode Deep Belief Network

Step 1.Begin
Step 2.Set visible units to a training dataset.
Step 3.For m=1to max iterations
Step 4.For n=1 to a size training data
Step 5.Update all hidden units
Step 6.Update all visible units to get model dataset
Step 7.Update all hidden units again
Step 8.Udate weights and biases
Step 9.Select another training dataset
Step 10. end

Decision Tree Algorithm

A decision tree is a flowchart-like construction in which each inner hub addresses a "test" on a characteristic for example regardless of whether a coin flip comes up heads or tails, each branch addresses the result of the test, and each leaf hub addresses a class name choice taken in the wake of registering all ascribes.

Pseudocode Decision Tree

1.Place the best attribute of the dataset at the root of the tree.
2.Split the training set into subsets. Subsets should be made in such a way that each subset contains data with the same value for an attribute.
3.Repeat step 1 and step 2 on each subset until you find leaf nodes in all the branches of the tree.

Statistical Analysis

SPSS software is used for statistical analysis of novel approaches on efficient prediction of online rummy games using Deep belief network compared over Decision Tree with improved accuracy. The independent variable is LSTM accuracy and the dependent variable is efficiency. The independent T test analyses are carried out to calculate the accuracy of the LSTM for both methods.

3. Results

Below Table shows the simulation result of proposed Deep belief network algorithm and the existing system Decision Tree were run at different times in the google colab with a sample size of 10. From the table, it was observed that the mean accuracy of the Machine learning Algorithms like Deep belief network algorithm was 80.91% and the Decision Tree algorithm was 69.88%.

The Mean, Standard Deviation and Standard Error Mean were calculated by taking an independent variable T test among the study groups[("Stress, the Brain and Depression" 2004)]. The Deep belief network algorithm produces a significant difference than the Decision Tree algorithm with a value of 0.220 and effect size=1.612.

Table 2 represents the Mean of Deep belief network algorithm which is better compared with the Decision Tree algorithm with a standard deviation of 0.71799 and 0.73395 respectively. From Deep belief network algorithm and Decision Tree algorithm in terms of mean and accuracy (Klakk et al. 2018). The mean results, the Deep belief network algorithm (80.91%) gives better accuracy than the Decision Tree algorithm (69.88%). Figure 1 gives the comparison chart of Deep belief network accuracy of the Decision Tree algorithm is better than Decision Tree. It is therefore, conclusive that LSTM performs better than Decision Tree. The resultant plots are shown below in figure. The figure has been placed at the end of the paper (Grøntved et al. 2014).

4. Discussion

Deep belief network and Decision Tree algorithms are implemented and compared for online rummy games Prediction to improve the accuracy by review prediction[(Zhou et al. 2021)]. From obtained results it is concluded that the Deep belief network algorithm provides better accuracy results compared to the Decision Tree algorithm.

In the recent survey, In this paper, A considerable lot of the current works connected with MDD are for the most part based on sacking and helping. The helping strategy diminishes the predisposition, in this manner expanding the prescient power, and stowing decreases the difference in the expectation model (Cummings, Caporino, and Kendall 2014). Inclination is the inclination to get familiar with some unacceptable relations by not thinking about all the elements. The model with high predisposition won't gain proficiency with the connection between the characteristics productively (Chekroud et al. 2016). Change is the proportion of showing how subordinate the created model is on the preparation information. On the off chance that the reliance is high, that would make the model temperamental. High Variance and High Bias will essentially influence the precision of the model (Tack 2019). As spotlight on working on the prescient power and furthermore decline the fluctuation of the model, we have executed the stacking speculation outfit model. The stacking gathering model diminishes the change as well as the predisposition and builds the prescient force of the model (Tack 2019). In this review, we have

carried out a Stacking Ensemble model to move along expectation exactness as well as abatement the change. We have utilized MLP, RF, and SVM as base-students and MLP as the meta-student (Mohanty et al. 2020).

From the above discussion, only a few articles ensure that they provide better performance than the proposed Deep belief network and Decision Tree algorithm for improving accuracy of ddos attack in a network prediction (Nguyen et al. 2019). So, we can infer that the proposed Deep belief network and Decision Tree algorithm can be used to improve the accuracy. The future scope of proposed work will be Predicting online rummy game mental disorder caused in youngsters using class labels for lesser time complexity.

5. Conclusion

Predicting online rummy game mental disorder caused in youngsters using Deep belief network compared over Decision Tree with improved accuracy. The work Deep belief network algorithm Prediction to be proved with better accuracy of 80.91% when compared to Decision Tree accuracy is 69.88%.

DECLARATION

Conflict of Interests

No conflict of interest in this manuscript.

Authors Contributions

Author SHV was involved in data collection, data analysis and manuscript writing. Author JJT was involved in the conceptualization, data validation and critical review of manuscript.

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6. References

Baraneedharan, P., Sethumathavan Vadivel, C. A. Anil, S. Beer Mohamed, and Saravanan Rajendran. 2022. "Advances in Preparation,

Mechanism and Applications of Various Carbon Materials in Environmental Applications: A Review." *Chemosphere*. <https://doi.org/10.1016/j.chemosphere.2022.134596>.

Bui, Eric, Meredith E. Charney, and Amanda W. Baker. 2019. *Clinical Handbook of Anxiety Disorders: From Theory to Practice*. Springer Nature.

Chekroud, Adam Mourad, Ryan Joseph Zotti, Zarrar Shehzad, Ralitza Gueorguieva, Marcia K. Johnson, Madhukar H. Trivedi, Tyrone D. Cannon, John Harrison Krystal, and Philip Robert Corlett. 2016. "Cross-Trial Prediction of Treatment Outcome in Depression: A Machine Learning Approach." *The Lancet Psychiatry*. [https://doi.org/10.1016/s2215-0366\(15\)00471-x](https://doi.org/10.1016/s2215-0366(15)00471-x).

Cummings, Colleen M., Nicole E. Caporino, and Philip C. Kendall. 2014. "Comorbidity of Anxiety and Depression in Children and Adolescents: 20 Years after." *Psychological Bulletin*. <https://doi.org/10.1037/a0034733>.

Deena, Santhana Raj, A. S. Vickram, S. Manikandan, R. Subbairaj, N. Karmegam, Balasubramani Ravindran, Soon Woong Chang, and Mukesh Kumar Awasthi. 2022. "Enhanced Biogas Production from Food Waste and Activated Sludge Using Advanced Techniques – A Review." *Bioresource Technology*. <https://doi.org/10.1016/j.biortech.2022.127234>.

Fried, E. I., R. M. Nesse, K. Zivin, C. Guille, and S. Sen. 2014. "Depression Is More than the Sum Score of Its Parts: Individual DSM Symptoms Have Different Risk Factors." *Psychological Medicine*. <https://doi.org/10.1017/s0033291713002900>.

Grøntved, Anders, Mathias Ried-Larsen, Niels Christian Møller, Peter Lund Kristensen, Niels Wedderkopp, Karsten Froberg, Frank B. Hu, Ulf Ekelund, and Lars B. Andersen. 2014. "Youth Screen-Time Behaviour Is Associated with Cardiovascular Risk in Young Adulthood: The European Youth Heart Study." *European Journal of Preventive Cardiology*. <https://doi.org/10.1177/2047487312454760>.

Jardri, Renaud, Arnaud Cachia, Pierre Thomas, and Delphine Pins. 2012. *The Neuroscience of Hallucinations*. Springer Science & Business Media.

Karpagam, M., R. Beaulah Jeyavathana, Sathiya Kumar Chinnappan, K. V. Kanimozhi, and M. Sambath. 2022. "A Novel Face Recognition Model for Fighting against Human Trafficking in Surveillance Videos and Rescuing Victims." *Soft Computing*. <https://doi.org/10.1007/s00500-022-06931-1>.

- Klakk, Heidi, Peter Lund Kristensen, Lars Bo Andersen, Karsten Froberg, Niels Christian Møller, and Anders Grøntved. 2018. "Symptoms of Depression in Young Adulthood Is Associated with Unfavorable Clinical- and Behavioral Cardiovascular Disease Risk Factors." *Preventive Medicine Reports*. <https://doi.org/10.1016/j.pmedr.2018.05.017>.
- Kumar, P. Ganesh, P. Ganesh Kumar, Rajendran Prabakaran, D. Sakthivadivel, P. Somasundaram, V. S. Vigneswaran, and Sung Chul Kim. 2022. "Ultrasonication Time Optimization for Multi-Walled Carbon Nanotube Based Therminol-55 Nanofluid: An Experimental Investigation." *Journal of Thermal Analysis and Calorimetry*. <https://doi.org/10.1007/s10973-022-11298-4>.
- McEwen, Bruce, and Sonia Lupien. 2002. "Stress: Hormonal and Neural Aspects." *Encyclopedia of the Human Brain*. <https://doi.org/10.1016/b0-12-227210-2/00333-2>.
- Mohanty, Sachi Nandan, Jyotir Moy Chatterjee, Sarika Jain, Ahmed A. Elngar, and Priya Gupta. 2020. *Recommender System with Machine Learning and Artificial Intelligence: Practical Tools and Applications in Medical, Agricultural and Other Industries*. John Wiley & Sons.
- Nagarajan, Karthik, Arul Rajagopalan, S. Angalaeswari, L. Natrayan, and Wubishet Degife Mammo. 2022. "Combined Economic Emission Dispatch of Microgrid with the Incorporation of Renewable Energy Sources Using Improved Mayfly Optimization Algorithm." *Computational Intelligence and Neuroscience* 2022 (April): 6461690.
- Nagaraju, V., B. R. Tapas Bapu, P. Bhuvaneswari, R. Anita, P. G. Kuppusamy, and S. Usha. 2022. "Role of Silicon Carbide Nanoparticle on Electromagnetic Interference Shielding Behavior of Carbon Fibre Epoxy Nanocomposites in 3-18GHz Frequency Bands." *Silicon*. <https://doi.org/10.1007/s12633-022-01825-1>.
- Nguyen, Ngoc Thanh, Richard Chbeir, Ernesto Exposito, Philippe Aniorté, and Bogdan Trawiński. 2019. *Computational Collective Intelligence: 11th International Conference, ICCCI 2019, Hendaye, France, September 4–6, 2019, Proceedings, Part II*. Springer Nature.
- Pandiyan, P., R. Sitharthan, S. Saravanan, Natarajan Prabakaran, M. Ramji Tiwari, T. Chinnadurai, T. Yuvaraj, and K. R. Devabalaji. 2022. "A Comprehensive Review of the Prospects for Rural Electrification Using Stand-Alone and Hybrid Energy Technologies." *Sustainable Energy Technologies and Assessments*. <https://doi.org/10.1016/j.seta.2022.102155>.
- Sharma, Rajnish, Archana Mantri, and Sumeet Dua. 2018. *Computing, Analytics and Networks: First International Conference, ICAN 2017, Chandigarh, India, October 27–28, 2017, Revised Selected Papers*. Springer.
- "Stress, the Brain and Depression." 2004. *Stress, the Brain and Depression*. <https://doi.org/10.1017/cbo9780511544422.010>.
- Tack, Christopher. 2019. "Artificial Intelligence and Machine Learning | Applications in Musculoskeletal Physiotherapy." *Musculoskeletal Science and Practice*. <https://doi.org/10.1016/j.msksp.2018.11.012>.
- Venu, Harish, Ibham Veza, Lokesh Selvam, Prabhu Appavu, V. Dhana Raju, Lingesan Subramani, and Jayashri N. Nair. 2022. "Analysis of Particle Size Diameter (PSD), Mass Fraction Burnt (MFB) and Particulate Number (PN) Emissions in a Diesel Engine Powered by Diesel/biodiesel/n-Amyl Alcohol Blends." *Energy*. <https://doi.org/10.1016/j.energy.2022.123806>.
- "Website." n.d. Mayo Clinic Staff. Depression. Accessed: Jul. 22, 2015. [Online]. Available: <https://www.org/diseasesconditions/depression/basics/definition/con-20032977>.
- Whangchai, Niwooti, Daovieng Yaibouathong, Pattranan Junluthin, Deepanraj Balakrishnan, Yuwalee Unpaprom, Rameshprabu Ramaraj, and Tipsukhon Pimpimol. 2022. "Effect of Biogas Sludge Meal Supplement in Feed on Growth Performance Molting Period and Production Cost of Giant Freshwater Prawn Culture." *Chemosphere* 301 (August): 134638.
- World Health Organization. 2009. *Global Health Risks: Mortality and Burden of Disease Attributable to Selected Major Risks*. World Health Organization.
- Yaashikaa, P. R., M. Keerthana Devi, and P. Senthil Kumar. 2022. "Advances in the Application of Immobilized Enzyme for the Remediation of Hazardous Pollutant: A Review." *Chemosphere* 299 (July): 134390.
- Zhou, Huiyu, Ling Li, Shiguang Shan, Shuo Wang, and Jian K. Liu. 2021. *Discrimination of Genuine and Posed Facial Expressions of Emotion*. Frontiers Media SA.

TABLES AND FIGURES

Table 1. Accuracy Values for DBN and DT

S.NO	DBN	DT
1	90.10	87.10
2	85.00	83.20
3	87.50	85.60
4	90.10	86.00
5	89.40	87.10
6	90.10	87.10
7	88.30	85.00
8	86.10	86.70
9	90.10	85.50
10	88.40	87.10

Table 2. Group Statistics Results-DBN has an mean accuracy (90.1000%), std.deviation (5.77), whereas for DT has mean accuracy (87.10%), std.deviation (4.5).

Group Statistics					
Accuracy	Groups	N	Mean	Std deviation	Std. Error
	DBN	10	90.100	5.77	2.58
	DT	10	87.100	4.5055	2.01

Table 3. Independent Samples T-test - DBN seems to be significantly better than RF (p=0.99)

Accuracy	Independent Samples Test								
	Levene's Test for Equality of Variances					T-test for Equality of Means			
	F	Sig	t	df	Sig(2-tailed)	Mean Difference	Std.Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
	0.297	0.600	0.916	8	.386	3.000	3.274	-4.55018	10.55018

assumed									
Equal variances not assumed			0.916	7.556	.388	3.000	3.274	-4.62819	10.62819

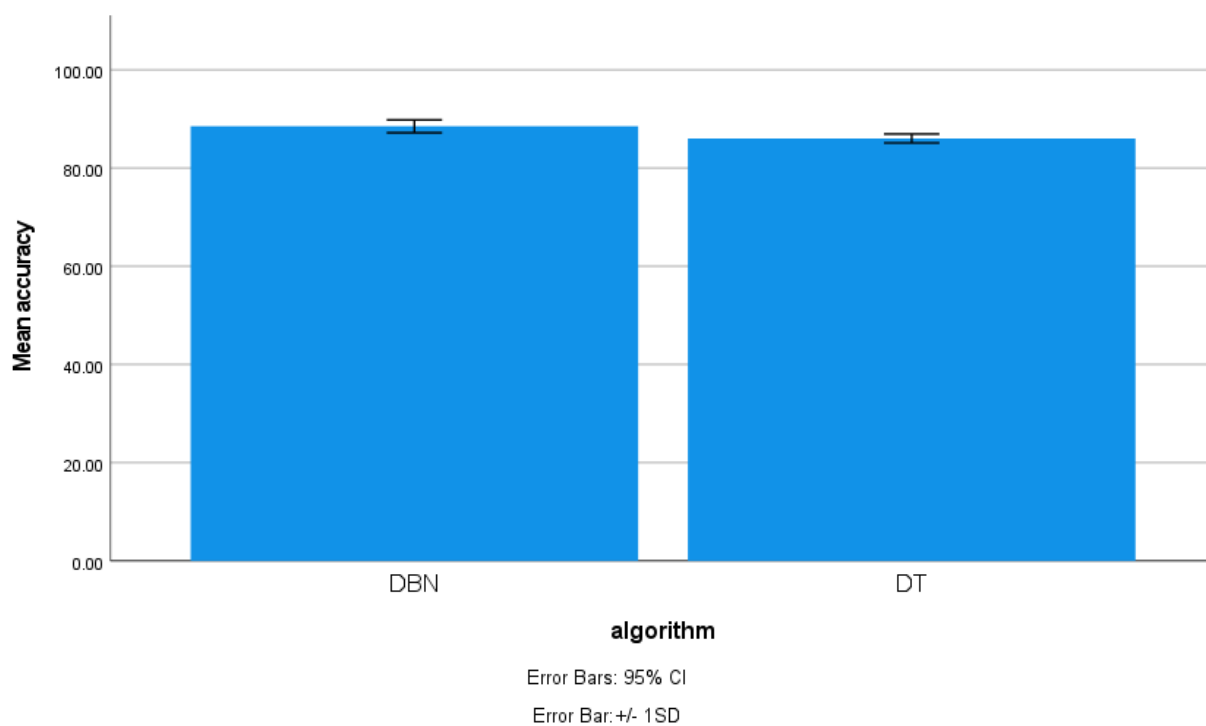


Fig. 1. Bar Graph Comparison on mean accuracy of DBN (90.10%) and RF (87.10%). X-axis: DBN, RF, Y-axis: Mean Accuracy with ± 1 SD.