|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Citation | Summary | Technology  they have used  (How did they  solve the  problem) | Limitations of  their work  (Research Gap) | Contribution  they have made | Critical Review |
| (Maina et al., 2017)  Maina, E.M., Oboko, R.O. and Waiganjo, P.W. (2017). Using Machine Learning Techniques to Support Group Formation in an Online Collaborative Learning Environment. International Journal of Intelligent Systems and Applications, 9(3), pp.26–33. doi:10.5815/ijisa.2017.03.04.  ‌ | A novel approach for grouping student in an online learning group task based on individual learners | Skmeans and Expectation Maximization (EM) machine learning algorithms are used | Grouping for  Only individual leaners |  | The initial fuzzy clustering approach to find the clusters center, which will serve as average of every cluster. |
| Suraya, G.R. and Wijayanto, A.W. (2022). Comparison of Hierarchical Clustering, K-Means, K-Medoids, and Fuzzy C-Means Methods in Grouping Provinces in Indonesia according to the Special Index for Handling Stunting. *Indonesian Journal of Statistics and Its Applications*, 6(2), pp.180–201. doi:10.29244/ijsa.v6i2p180-201.  ‌ | The government's development has not all been evenly distributed to small districts that are difficult to access in Riau Province, which causes inequality in the welfare of society. | Fuzzy C-Means and K-Medoids, | high state of community welfare, cluster two is a group with low community welfare conditions |  |  |
| Wu, Y. and Yoshii, K. (2022). Joint Chord and Key Estimation Based on a Hierarchical Variational Autoencoder with Multi-task Learning. *APSIPA Transactions on Signal and Information Processing*, 11(1). doi:10.1561/116.00000052.  ‌ | Recently e-learning is considered one of the progressive methods in online education in long-lasting terms, | Fuzzy Logic  K-Means Clustering  DBSACN and SVM |  |  |  |

# Steps of machine learning research

1. Data save (Collect data)

* Primary dataset

1. Data preparing
2. Model training (Choose model)
3. Development (Evaluating model)

!.Reading research papers

2.summerise in research papers

1. Identify the contribution to body of knowledge
   * + 1. Contribution to problem domain

We empirically validate that joint learning of IAR and people grouping is effective for GAR.

Since our joint learning can be integrated with any IAR methods, its effectiveness is validated with various IAR methods.

By employing existing GAR methods for ensembling with our proposed method, the GAR results outperform the similar SOTA GAR methods.

* + - 1. Contribution to research domain

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1. Again, answer the following question:
2. What is the contribution
3. Why is it a contribution? (Justification)
4. Also try to answer following question where it is applicable
   * + 1. How is it a contribution?
       2. When and where it is applicable

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