**Paper Summary 2**

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| Paper number | 2 |
| Read by | Param Jagani |
| Title of paper and author details | Customer churn prediction system: a machine learning approach  Authors - Praveen Lalwani, Manas Kumar Mishra, Jasroop Singh Chaddha, Pratyush Sethi |
| Publication year, publication body | 2022  Springer-Verlag GmbH, a segment of Springer Nature. |
| Domain of paper [sentiment analysis/ ontology construction…etc] | Finance and Banking  Customer Relationship Management (CRM)  Predictive Analytics |
| Dataset used/ Datasources [if any] | Dataset that was divided into categorical and numerical features. It consisted of 21 features, with 16 being categorical and 5 numerical. |
| Implementation tools/ technlologies used [if any] | Support Vector Machine (SVM)  Logistic Regression  Gravitational Search Algorithm (GSA)  Naive Bayes  Random Forest (RF)  Boosting Technique: Adaboost and XGBoost |
| Results given and evaluation parameters used | The study highlights that the highest accuracy of 81.71% and an AUC score of 84% were achieved using Adaboost and XGBoost classifiers |
| Highlights/summary of paper in your words | The paper used the Gravitational Search Algorithm (GSA) for feature selection, which improved the accuracy of the machine learning models by reducing dimensionality.  Evaluation: The models were evaluated using K-fold cross-validation, confusion matrices, and AUC curves, ensuring robust performance validation. |
| Future enhancements suggested | **Model Optimization**: Explore advanced optimization techniques such as Bayesian Optimization or Genetic Algorithms for hyperparameter tuning to further enhance model performance.  **Real-Time Prediction**: Implement real-time prediction capabilities to allow banks to immediately identify at-risk customers and take prompt action to retain them.  **Continuous Learning**: Develop mechanisms for continuous model training and updating to adapt to changing customer behaviors and market conditions, ensuring the model remains relevant and accurate over time. |