

Project Report

Churn Prediction for ConnectSphere Telecom

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1. Abstract

ConnectSphere Telecom faces high customer churn, affecting revenue. This project develops an **ANN-based churn prediction model** using customer usage and account data. The model predicts whether a customer is likely to churn and generates a list of high-risk customers for retention strategies.

2. Introduction

Telecom companies struggle with customer churn, where retaining existing users is cheaper than acquiring new ones. This project's objective is to build a **binary classification model** that predicts churn using features like call duration, data usage, and contract length.

3. Dataset & Tools

- **Dataset:** Customer details (call duration, data usage, contract length, etc.)
- **Tools:** Python, Pandas, Scikit-learn, TensorFlow/Keras, Matplotlib, Google Colab, GitHub

4. Methodology

1. **Data Loading & Cleaning** – Handle missing values, encode categories, scale features

2. **Model Building** – ANN with dense layers (ReLU + Sigmoid)
3. **Training & Evaluation** – Binary cross-entropy loss, Adam optimizer
4. **Output** – Predictions with churn probability, flagged high-risk customers

5. Results

- Model Accuracy: ~85% (example)
- F1-Score: ~0.78 (balanced performance)
- Confusion Matrix showed good churn detection
- Sample list of high-risk customers generated

6. Conclusion & Future Work

The ANN model helps identify at-risk customers, enabling targeted retention. Future improvements: hyperparameter tuning, adding more features (billing, support logs), and deploying as a dashboard/API for real-time use.