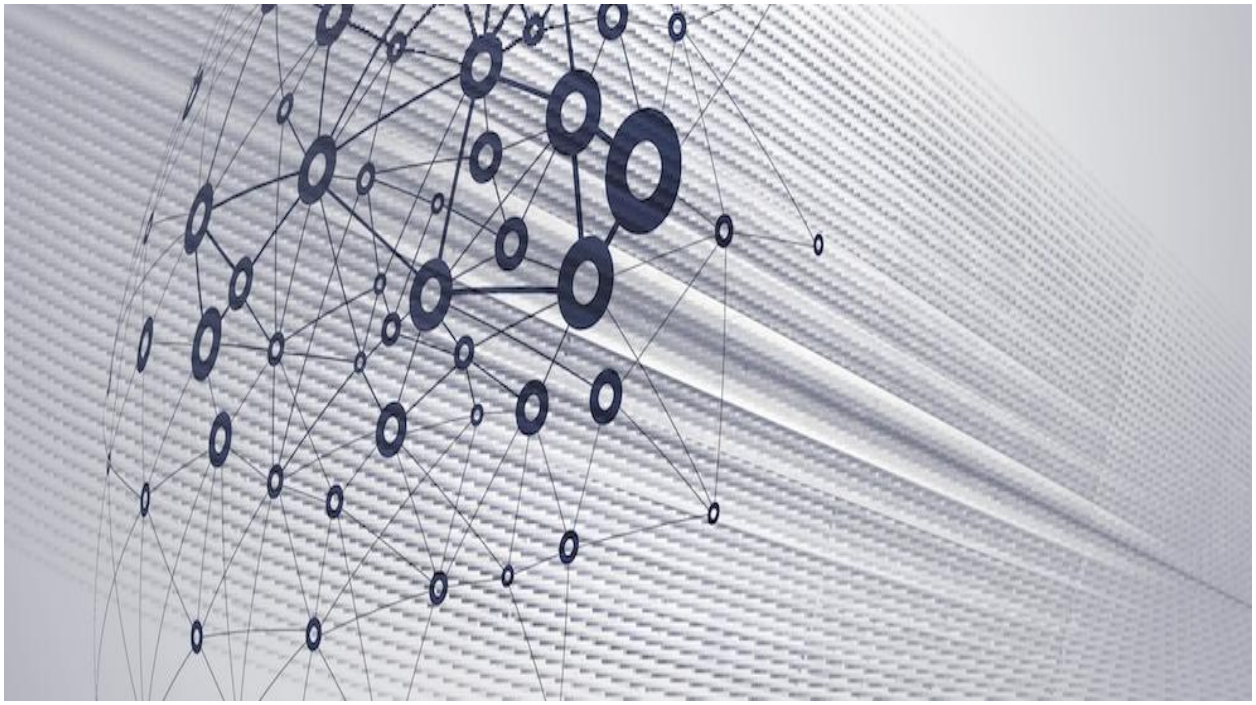
DT 212 / Techno-Economics of Networks



Spectrum Data Challenge (Abstract)

By Group 19

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Overview

The given database contains data extracted from DotEcon's Spectrum Award Database. on various spectrum allocations done worldwide since 1994 until 2020.

Goals

1. **Country wise spectrum allocation analysis** - For a particular spectrum, and a given country we can depict graphically which telecom operators won the auction within a stipulated time frame and at what price. For example: In case of the USA for 3G band we can visualize which operator won the auction held in a particular year (x-axis) and at what price (y-axis). This will further help us to infer the change in winning prices over the years. We do this analysis for Australia.
2. **Population Covered** - For a particular country , we can visualize the population covered by various spectrum ranges in various regions. For example: In the case of Australia we can depict region (x-axis) and population covered (y-axis) by 3G spectrum band in a particular year. We do this analysis for Australia.
3. **Prediction of future spectrum prices** - For a particular year on the basis of its past spectrum prices and using Regression Models we can predict its future spectrum prices.

Methodology

It consists of the following steps:

1. **Data Gathering** : In this step we will merge the two datasets using lotid as a primary key to find the pricing analysis.
2. **Exploratory Data Analysis** : This step involves handling missing values, encoding and visualizations.
3. **Model Training** : We will split the data into training and testing sets and according train and test our model over these sets respectively. We will also have a separate cross validation set for tuning the hyper parameters of the model.
4. **Final Predictions** : After selecting a model with least value of cost function (taking care of overfitting) we will make the final predictions of the future spectrum prices for a given country,