

In the field of power distribution and electrical grid

### Work title:

“A literature and research-based study to identify the most optimal model for forecasting household power load: A case study of five household types”

### Background:

This bachelor thesis explores various models used in recent studies for forecasting household power load. The study encompasses different forecast durations, including day-ahead, week-ahead, and longer-term forecasts. It involves reviewing different publications to identify the most robust models by comparing evaluation metrics such as Mean Absolute Error (MAE), Root Mean Square Error (RMSE), and Mean Absolute Percentage Error (MAPE). Moreover, this analysis will highlight the models' robustness in terms of accurately capturing peak loads. The models are categorized into different types, including Recurrent Neural Networks (RNN), Artificial Neural Networks (ANN), regression models, and more. Given the significant number of studies involving the Long Short-Term Memory (LSTM) model, this research also includes a modified LSTM model tested with pre-existing data. In the final step of the research, the models will be ranked from the best to the weakest in terms of household power load forecasting. Additionally, the results of the LSTM model, along with its evaluation metrics, will be analyzed to demonstrate the robustness of the modified model for forecasting household power loads, with a case study involving five types of households.

### Outline of the content:

- Literature review to improve the academic background
- Studying different types of models used for household forecast
- Comparing different models to find the most optimum one
- Investigating the robustness of modified LSTM model with pre-existing data

### Requirements:

- Background in Electrical Engineering
- Programming and data analysis skills
- Interest in Power distribution and forecasting
- Motivation to Solve Problems

