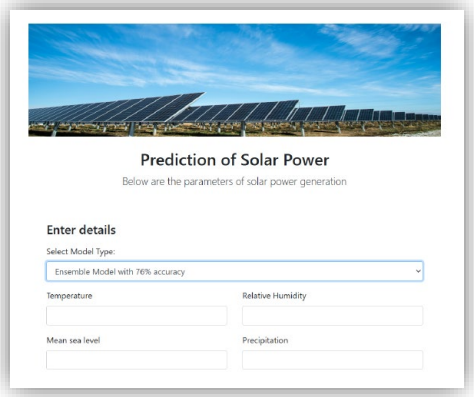
Case Study 1:
Ensemble Learning Methods for Forecasting Solar Power Generation depending on Meteorological Parameters
(Detailed Case Study Report)

Group members: Akash Sathish Kumar Pillai, Sarun Sabu, and Jesvin Jose

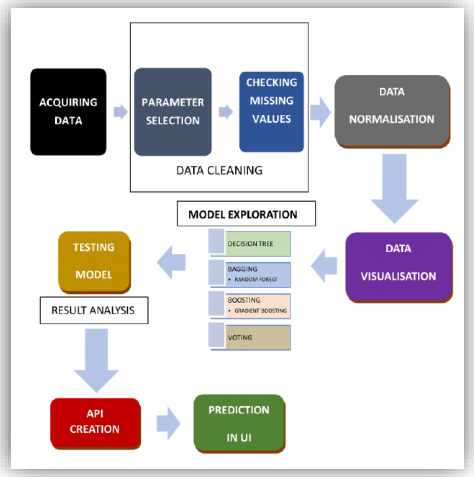
In this study, the students have used machine learning (ML) techniques to predict solar power output based on various meteorological parameters. They have employed regression (R), decision tree (DT), random forest (RF), and gradient boosting (GB) algorithms. To enhance predictive accuracy, the ensemble approach was applied using the voting regression. This ensemble model manipulating the strength of each base model, resulting in a robust and well generalized predictor for solar power generation.

A user-friendly and interactive web-based using Flask, a lightweight and extensible web framework for Python. The UI facilitates accessibility and usability.

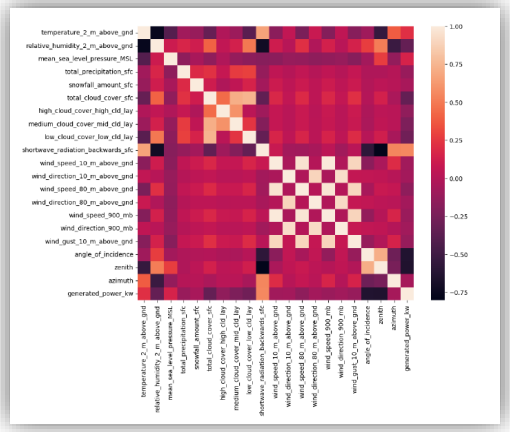
Keywords – Solar power generation, Meteorological, Regression, Decision Tree, Random forest, Gradient boosting, Ensemble method, Flask, and Graphical user interface



Graphical user interface using Flask



ML- Methodology Flow Chart



Heatmap: Correlation of Independent variables