1. a new residual ensemble learning approach, which consists of two advanced base models, namely Deep Neural Networks (DNNs) and Recurrent Neural Networks (RNNs), is proposed for solar irradiance forecasting
2. Firstly, a mechanism is proposed for the collection and analysis of multiple-site data surrounding the target location. A hexagon gridding system based algorithm is proposed for selection of multiple sites neighboring the target location. Then, correlation and feature importance scores are utilized as measures for feature selection to choose the most relevant data for forecasting target solar irradiance.
3. e. In the second module, a residual ensemble learning model is proposed to forecast solar irradiance.
4. t, the proposed framework is validated with data from four different solar power sites obtained from NASA’s POWER repository
5. . The residual ensemble model is trained on past 36 years of data as input for forecasting one day ahead, four days ahead and ten days ahead values of solar irradiance.
6. The proposed model shows an improvement in forecast performance by approximately 2.5 percent in prediction error.
7. This research is motivated to develop the feature selection mechanism for data selection utilizing a single feature in a multivariate manner considering data relevance and dependency