|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Methods | Variable | Location | Article | Personal Comment |
| Traditional  (not neural network) |  |  |  |  |
| Copula functions and first order Markov process | wind speed and PV | (NREL) | A Copula Function Based Monte Carlo Simulation Method of Multivariate Wind Speed and PV Power Spatio-Temporal Series | Temporal and spatial not at the same time. Actually is two simulations combined. |
| FCSAR  (auto regressive) | GHI | Lanai, Hawaii | A semiparametric spatio-temporal model for solar irradiance data | Time: functional coefficient autoregressive model of order p (Spline-backfitting kernel estimation)  Spatial: simultaneous autoregressive (SAR) model  Separate modeling as well as spatio-temporal model |
| linear Auto-Regressive models with eXogenous inputs | PV | NREL radiometer grid – Hawaii | Impact of network layout and time resolution on spatio-temporal solar forecasting | This paper has a summary of methods. Worth to check it. |
| kriging and a naïve Bayes Classifier | PV (irradiance) | South Korea | Probabilistic Forecasting Model of Solar Power Outputs Based on the Naïve Bayes Classifier and Kriging Models | Kriging first, then NBC.  Kriging for spatial  NBC for time. |
| Space–time kriging//  Vector autoregressive (VAR) model//  parameter shrinkage models | GHI | Singapore | Solar irradiance forecasting using spatio-temporal empirical kriging and vector autoregressive models with parameter shrinkage | Many cross–correlation analysis involved  3 models are all useful. |
| Kernel Density Estimation (KDE) and the Extreme Learning Machine (ELM) | PV | a mid-west region of France | Probabilistic Models for Spatio-Temporal Photovoltaic Power Forecasting | KDE: density model  ELM: nonparametric  Not useful for certain days ahead, but for total cdf. |
| sequential reconciliation  (generalized least squares) | PV | California | Reconciling solar forecasts: Sequential reconciliation | spatial-then-temporal reconciliation or temporal-then-spatial  hierarchy involved but separate between time and space |
| Gaussian process//  Quantile regression// ARIMA | PV/ Electricity/ Net load | Hawaii | Spatio-temporal probabilistic forecasting of solar power, electricity consumption and net load | Consider electricity with CV, care about Net load. |
| Lasso on data matrix | PV | Hawaii | Ultra-fast preselection in lasso-type spatio-temporal solar forecasting problems | It has many stations also and still claimed to be fast method using Lasso. |
|  |  |  |  |  |
| Neural Network |  |  |  |  |
| EEMD-SOM-BP method  (ensemble empirical mode decomposition)  (Self-organizing map)  (back-propagation) | PV (hourly) | China east coast | Day-ahead spatio-temporal forecasting of solar irradiation along a navigation route | First decompose the radiation and then do NN.  Decompose is not what we need since we are working on daily sum, so what we care is SOM and BP. |
| Generative Learning | GHI | near the Lake Michigan | Convolutional Graph Autoencoder: A Generative Deep Neural Network for Probabilistic Spatio-temporal Solar Irradiance Forecasting | Generative Learning for PDF,  Is for PDF , not predict ahead |
| Echo state network-based spatial-temporal | PV | China | Echo state network-based spatial-temporal model for solar irradiance estimation | One-hour ahead prediction |
| Tensor(which are a higher dimensional extension of vectors and matrices.) | PV | Kansas  (NREL) | Multivariate Spatio-temporal Solar Generation Forecasting: A Unified Approach to Deal With Communication Failure and Invisible Sites | short-term prediction strategy to forecast six-hour-ahead |