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Solar Energy Prediction System

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Abstract: *Solar power will become even more affordable in the coming years thanks to advancements in technology. It's possible that solar energy will be the most important source of energy for the production of electricity in a significant portion of the world by the year 2030. Climate change and the environment will also benefit from this. In this paper, we implement the SVM method to achieve the quick and accurate real-time prediction of solar radiation may be, in contrast to the majority of existing research works on solar radiation prediction, which largely focus on the offline solar radiation prediction.*

Keywords: Solar Power

I. INTRODUCTION

1.1 Detailed Introduction

The increasing demand for renewable energy and the dramatic cost reduction in photovoltaic modules (PV) have been promoting the expansions of solar power world-wide, which is expected to grow by The uncertainty in PV power outputs due to the intermittency of solar radiation in changing weather conditions can affect the operation and economies of PV systems, and therefore hinder their expected growth By allowing for the optimization of solar energy integration, guaranteeing grid stability, and controlling energy markets, the capability to predict solar radiation with reliability offers a solution to this issue. The essay is organized as follows for the remaining portions. Section II provides an explanation of the suggested embedding and extraction algorithms. Section III presents the experimental findings. Section IV has the conclusion.

1.2 Need for the New System

Solar power will become even more affordable in the coming years thanks to advancements in technology. Solar power will become even more affordable in the coming years thanks to advancements in technology. It's possible that solar energy will be the most important source of energy for the production of electricity in a significant portion of the world by the year 2030. Climate change and the environment will also benefit from this.

1.3 Motivation

Our motive for estimating solar intensity is that it is directly proportional to solar electricity generation. The output of solar generation in a specific area in the near future can be more precisely predicted if we are able to accurately model future sun intensity given present meteorological data. Through the use of image processing and forecasting algorithms, these satellites make it possible to generate solar power forecasts for large areas.

1.4 Presently Available Systems for the Same

- Photovoltaics Concentrating Solar Power
- Solar Heating and Cooling

II. PROPOSED ALGORITHM

3.1 Support Vector Machine Algorithm

Support Vector Machine, also known as SVM, is a linear model used to solve classification and regression issues. It works well for many practical problems and can solve linear and nonlinear problems. The fundamental idea behind SVM is that information is separated into classes by a calculation that creates a line or hyperplane.

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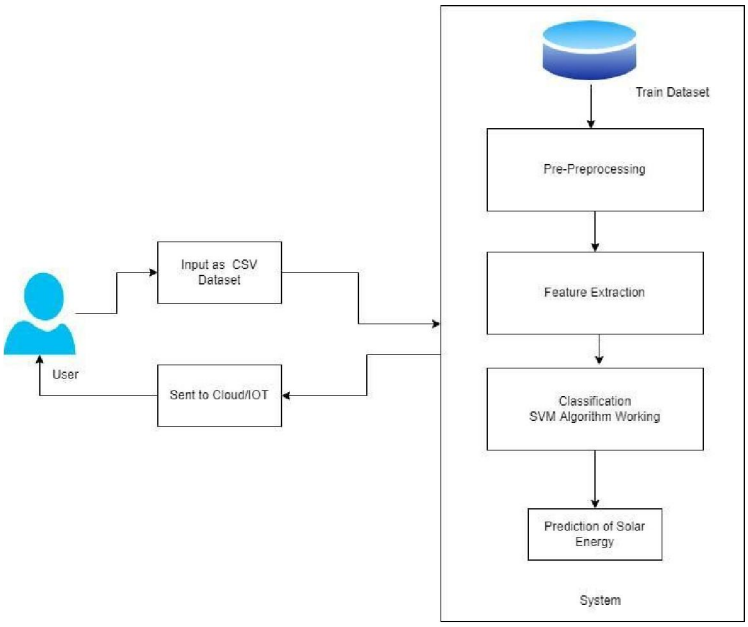
The ability to create non-linear dependencies between the input and output data sets gives Artificial Neural Networks (ANN) one advantage over natural neural networks. Predictions of the advanced quality can be achieved by SVM. To study further possible advancements in vaticination quality, a study on datasets fetched from Kaggle, is performed to estimate their felicity as input features. The Results showed that the SVM model performed more than ANN model.

III. EXPERIMENT AND RESULT

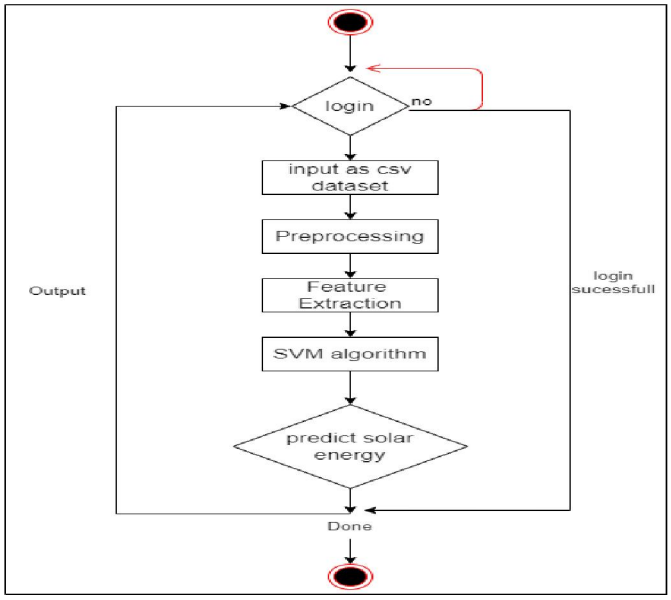
3.1 Objectives and Goals

- To predict the solar energy,
- To increase the accuracy,
- Time and cost saving,
- Our application is effective and efficient to us.

IV. SYSTEM ARCHITECTURE



4.1 Activity Diagram



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V. CONCLUSION

Results demonstrate that our algorithm outperforms other algorithms when faced with unpredictable weather. In order to further improve performance of our algorithm, we are considering dynamic tuning of scaling parameters used in our algorithm so that it could dynamically tune its performance in run time. Using SVM algorithm we can predict the solar energy. More accuracy can be detected.

REFERENCES

[1]. S. Sobri, S. Koohi-Kamali, and N. A. Rahim, "Solar photovoltaic generation forecasting methods: A review," Energy Convers. Manag., vol. 156, pp. 459–497, Jan. 2018.

[2]. O. Ayvazogluy˘uksel¨ and U. B. Filik, "Estimation methods of global solar radiation, cell temperature and solar power forecasting: A review and case study in Eskisehir," Renew. Sustain. Energy Rev., vol. 91, pp. 639–653, Aug. 2018.

[3]. S. Sperati, S. Alessandrini, And L. Delle Monache, "An Application Of The Ecmwf Ensemble Prediction System For Short-Term Solar Power Forecasting," Sol. Energy, VOL. 133, PP. 437–450, AUG. 2016.

[4]. T. Eseye, J. Zhang, and D. Zheng, "Short-term photovoltaic solar power forecasting using a hybrid Wavelet-PSO-SVM model based on SCADA and Meteorological information," Renew. Energy, vol. 118, pp. 357–367, Apr. 2018.

[5]. M. Abuella and B. Chowdhury, "Random Forest ensemble of support vector regression models for solar power forecasting," in 2017 IEEE Power Energy Society Inovative Smart Grid Technologies Conference (ISGT), 2017, pp. 1-5.

[6]. M. K. Behera, I. Majumder, and N. Nayak, "Solar photovoltaic power fore- casting using optimized modified extreme learning machine technique," Eng. Sci. Technol. an Int. J., vol. 21, no. 3, pp. 428–438, Jun. 2018.