

**DATA ANALYTICS**

**PROJECT REPORT**

**PROJECT NAME:  
SOLAR PANEL FORECASTING**

**Team :**

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**Pavan**

## SOLAR PANEL FORECASTING

### 1. Introduction

During our short-term internship with Smart Bridge, we have delved into the world of data analytics, with a primary focus on solar panel forecasting. In this introductory section, we will provide an overview of the importance of data visualization in conveying insights and our objective to create informative visualizations, including dashboards, reports and data stories.

#### a. Overview:

Short-term forecasting provides predictions up to seven days ahead. Due to the power market regulation in many jurisdictions, intra-day forecasts and day-ahead solar power forecasts are the most important time horizons in this category. Basically all highly accurate short-term forecasting methods leverage several data input streams such as meteorological variables, local weather phenomena and ground observations along with complex mathematical models.

### b. purpose

Solar power forecasting is the process of gathering and analyzing data in order to predict solar power generation on various time horizons with the goal to mitigate the impact of solar intermittency. Solar power forecasts are used for efficient management of the electric grid and for power trading.

### 2. Literature Survey:

Before delving into our own works, it is essential to review the existing literature on solar panel forecasting. This section will provide a comprehensive look at prior research and established methods in the field. We will explore how data analytics and visualization have been applied in the context of solar energy predictions.

### a. Existing problem

1. Solar panels are not always efficient in converting sunlight into energy.
2. Solar panels can be damaged by severe weather also environmental problem with Solar panels.

# Dashboard



3. Solar panels require regular maintenance.
4. Solar panels can be aesthetically displeasing
5. Electrical issues; Solar panels are connected to the electrical grid. If not fixed, this can lead to a loss of power or even a fire.

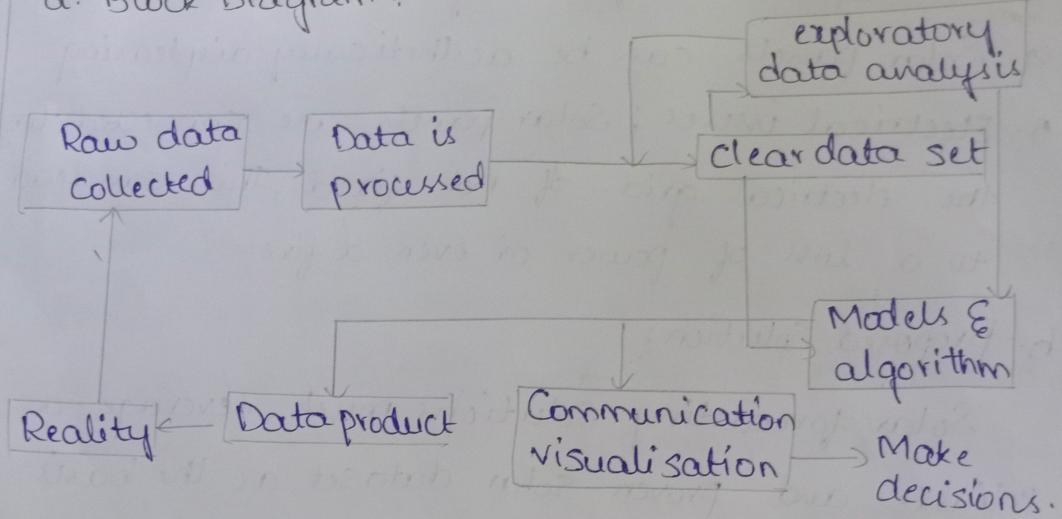
#### b. proposed Solution:

Solar forecasting solutions must leverage a reliable and proven solar dataset as the basis for delivering a quality forecast. The solar forecast must be built on a foundation of trusted, reliable and accurate solar data.

#### 3. Theoretical Analysis:

In this section, we will transition from the literature survey to our own theoretical analysis. We will delve into the principles, models and methodologies we have employed to forecast solar panel performance. This is where we outline the concepts and theories that underpin our work including the factors considered in solar energy prediction.

a. Block Diagram :



b. Hardware / Software designing :

Aurora Solar design software that helps solar companies quickly design photovoltaic systems that are tailored to each client's specific needs.

Open Solar is a free solar design, sales and management software with a built-in CRM, digital scheduling, real-time customer alerts.

The Collected data :

First hour of period

Is Daylight

Distance to Solar noon

Average temperature(day)

Average wind direction(day)

Average wind speed (day)

Sky Cover .



Visibility  
Humidity  
Average wind speed (period)

#### 4. Result :

The result section will delve into the specific findings we have uncovered during our internship. It will include a summary of the insights gained from our data visualizations and analytical work. This section should highlight key takeaways from the project, such as notable trends, performance indicators, and data driven recommendations.

## 5. Advantages & Disadvantages

Advantages :

Clear energy source

Reduction in electricity bill

Multiple Applications

Low maintenance cost

Independent Source of energy

Sustainable

Lower water pollution.

Low impact on environment.

Disadvantages :

Installation cost is too high

Reliability

Lots of space required for installation.

Not efficient

Pollution and impact on environment.

## 6. Applications:

Our work extends beyond the theoretical realm, as we aim to apply our findings in practical scenarios. This section will explore the real-world applications of solar panel forecasting, including how our data analytics and visualizations can be used in

# Report



energy management, solar panel installation planning, and sustainable energy initiatives.

#### 7. Conclusion:

In the conclusion, we will summarize the significance of our internship project with Smart bridge. This section will emphasize the value of data analytics and data visualization in the context of solar panel forecasting. We will reiterate the key takeaways from our work and highlight its potential impact on the field.

#### 8. Future Scope:

The future scope section will provide insights into what lies ahead. We will discuss potential areas for further research and development in solar panel forecasting, as well as how our work can serve as a foundation for future projects and innovations. This will open the door to ongoing exploration and improvement in this critical field.

# Index. Html

```
<!DOCTYPE html>
<html lang="en">

    <head>
        <meta charset="utf-8">
        <meta content="width=device-width,
initial-scale=1.0" name="viewport">

        <title>solar panel</title>
        <meta content="" name="description">
        <meta content="" name="keywords">
        <!-- Favicons -->
        <link
            href="{{ url_for('static',filename='assets/
img/favicon.png')}}" rel="icon">
        <link
            href="{{ url_for('static',filename='assets/
img/apple-touch-icon.png')}}" rel="apple-touch-icon">

        <!-- Google Fonts -->
        <link href="https://fonts.googleapis
.com/css?family=Open+Sans:300,300i
,400,400i,600,600i,700,700i|Raleway:
300,300i,400,400i,500,500i,600,600i,700
,700i|Poppins:300,300i,400,400i,500,500i
,600,600i,700,700i" rel="stylesheet">

        <!-- Vendor CSS Files -->
        <link
            href="{{ url_for('static',filename='assets/
vendor/aos/aos.css')}}" rel="stylesheet">
        <link
            href="{{ url_for('static',filename='assets/
vendor/bootstrap/css/
bootstrap.min.css')}}" rel="stylesheet">
        <link
```

```
    href="{{ url_for('static',filename='assets/
    vendor/bootstrap-icons/
    bootstrap-icons.css')}}" rel="stylesheet">
        <link
    href="{{ url_for('static',filename='assets/
    vendor/boxicons/css/
    boxicons.min.css')}}" rel="stylesheet">
        <link
    href="{{ url_for('static',filename='assets/
    vendor/glightbox/css/
    glightbox.min.css')}}" rel="stylesheet">
        <link
    href="{{ url_for('static',filename='assets/
    vendor/remixicon/remixicon.css')}}""
    rel="stylesheet">
        <link
    href="{{ url_for('static',filename='assets/
    vendor/swiper/swiper-bundle.min.css')}}""
    rel="stylesheet">

    <!-- Template Main CSS File -->
    <link
    href="{{ url_for('static',filename='assets/
    css/style.css')}}" rel="stylesheet">

    <!-- =====
=====
    * Template Name: Gp
    * Updated: Sep 18 2023 with Bootstrap
v5.3.2
    * Template URL: https://bootstrapmade.com/gp-free-multipurpose-html-
bootstrap-template/
    * Author: BootstrapMade.com
    * License: https://bootstrapmade.com/
license/
=====
```

```
=====
-->
</head>

<body>

<!-- ===== Header ===== -->
<header id="header" class="fixed-top ">
  <div class="container
d-flex align-items-center
justify-content-lg-between">

    <h1 class="logo me-auto me-lg-0"><a
href="index.html">solar panel<span>.</
span></a></h1>
    <!-- Uncomment below if you prefer to
use an image logo -->
    <!-- <a href="index.html" class="logo
me-auto me-lg-0"></a>-->

    <nav id="navbar" class="navbar
order-last order-lg-0">
      <ul>
        <li><a class="nav-link scrollto
active" href="#hero">Home</a></li>
        <li><a class="nav-link scrollto"
href="#about">dashboard</a></li>
        <li><a class="nav-link scrollto"
href="#services">story</a></li>
        <li><a class="nav-link scrollto "
href="#portfolio">report</a></li>
        <li><a class="nav-link scrollto"
href="#team"></a></li>
        <li class="dropdown"><a
href="#"><span></span> <i class="bi
bi-chevron-down"></i></a>
          <ul>
```

```
</div>
</header><!-- End Header -->

<!-- ===== Hero Section ===== -->
<section id="hero" class="d-flex align-items-center justify-content-center">
  <div class="container" data-aos="fade-up">

    <div class="row justify-content-center" data-aos="fade-up" data-aos-delay="150">
      <div class="col-xl-6 col-lg-8">
        <h1>solar panel forecasting<span>.</span></h1>
        <h2>analysis using dashboard,story,report.</h2>
      </div>
    </div>

    <div class="row gy-4 mt-5 justify-content-center" data-aos="zoom-in" data-aos-delay="250">
      <div class="col-xl-2 col-md-4">
        <div class="icon-box">
          <i class="ri-store-line"></i>
          <h3><a href=""></a></h3>
        </div>
      </div>
      <div class="col-xl-2 col-md-4">
        <div class="icon-box">
          <i class="ri-bar-chart-box-line"></i>
          <h3><a href=""></a></h3>
        </div>
      </div>
      <div class="col-xl-2 col-md-4">
        <div class="icon-box">
          <i class="ri-calendar-todo-line"></i>
```

```
<h3><a href=""></a></h3>
</div>
</div>
<div class="col-xl-2 col-md-4">
<div class="icon-box">
<i class="ri-paint-brush-line"></i>
<h3><a href=""></a></h3>
</div>
</div>
<div class="col-xl-2 col-md-4">
<div class="icon-box">
<i class="ri-database-2-line"></i>
<h3><a href=""></a></h3>
</div>
</div>
</div>

</div>
</section><!-- End Hero -->

<main id="main">

<!-- ===== About Section ===== -->
<section id="dashboard"
class="dashboard">
<div class="container"
data-aos="fade-up">

<div class="row">
<iframe src="https://us3.ca
.analytics.ibm.com/bi/?perspective
=dashboard&pathRef=.my
_folders%2Fsolar_dashboard&
closeWindowOnLastView=true&
ui_appbar=false&ui_navbar
=false&shareMode=embedded&
action=view&mode=dashboard

```

```
amp;action=view&mode=dashboard
&subView=model0000018b21bf8684
_00000000" width="1000" height="800"
frameborder="0" gesture="media"
allow="encrypted-media"
allowfullscreen=""></iframe>
</section><!-- End About Section -->

<!-- ===== Clients Section =====
-->

</section><!-- End Clients Section -->

<!-- ===== Features Section =====
-->

</section><!-- End Features Section -->

<!-- ===== Services Section =====
-->
<section id="services"
class="services">
<div class="container"
data-aos="fade-up">

<div class="section-title">
<h2>story</h2>
<p>about story</p>
</div>

<div class="row">
<iframe src="https://
us3.ca.analytics.ibm.com/bi/
?perspective=story&pathRef=
.my_folders%2FSOLAR%2Bstory&
amp;closeWindowOnLastView=true&
amp;ui_appbar=false&ui_navbar
&ui_header=false"></iframe>
</div>
</div>
```

```
=false&amp;shareMode=embedded
&amp;action=view&amp;scenId=-1
&amp;sceneTime=0" width="1000"
height="800" frameborder="0"
gesture="media" allow="encrypted-media"
allowfullscreen=""></iframe>
</section><!-- End Services Section -->

<!-- ===== Cta Section ===== -->

</section><!-- End Cta Section -->

<!-- ===== Portfolio Section =====
-->
<section id="portfolio"
class="portfolio">
<div class="container"
data-aos="fade-up">

<div class="section-title">
<h2>report</h2>
<p>report</p>
</div>

<div class="row" data-aos="fade-up"
data-aos-delay="100">
<iframe src="https://us3.ca
.analytics.ibm.com/bi/?pathRef=
.my_folders%2FSOLAR%2Breport&
amp;closeWindowOnLastView=true&
amp;ui_appbar=false&amp;ui_navbar
=false&amp;shareMode=embedded&
amp;action=run&amp;format=HTML
&amp;prompt=false" width="1000"
height="800" frameborder="0"
gesture="media" allow="encrypted-media"
allowfullscreen=""></iframe>
```

```
</section><!-- End Portfolio Section -->

<!-- ===== Counts Section =====
-->

</section><!-- End Counts Section -->

<!-- ===== Testimonials Section
===== -->

<!-- ===== Team Section ===== -->

</section><!-- End Team Section -->

<!-- ===== Contact Section =====
-->

</section><!-- End Contact Section -->

</main><!-- End #main -->

<!-- ===== Footer ===== -->

</footer><!-- End Footer -->
```

```
<div id="preloader"></div>
<a href="#" class="back-to-top
d-flex align-items-center
justify-content-center"><i class="bi
bi-arrow-up-short"></i></a>

<!-- Vendor JS Files -->
<script
src="{{ url_for('static',filename='assets/
vendor/purecounter/
purecounter_vanilla.js')}}"></script>
<script
src="{{ url_for('static',filename='assets/
vendor/aos/aos.js')}}"></script>
<script
src="{{ url_for('static',filename='assets/
vendor/bootstrap/js/
bootstrap.bundle.min.js')}}"></script>
<script
src="{{ url_for('static',filename='assets/
vendor/glightbox/js/
glightbox.min.js')}}"></script>
<script
src="{{ url_for('static',filename='assets/
vendor/isotope-layout/
isotope.pkgd.min.js')}}"></script>
<script
src="{{ url_for('static',filename='assets/
vendor/swiper/
swiper-bundle.min.js')}}"></script>
<script
src="{{ url_for('static',filename='assets/
vendor/php-email-form/validate.js')}}"></
script>

<!-- Template Main JS File -->
```

```
<!-- Template Main JS File -->
<script
src="{{ url_for('static',filename='assets/js/
main.js')}}"></script>

</body>

</html>
```

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# flask code

```
from flask import Flask, render_template,  
request
```

```
app = Flask(__name__) # initializing the  
flask app
```

```
@app.route('/')  
def helloworld():  
    return render_template('index.html')
```

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