**Title:**

**IOT based Product for Solar prediction for smart homes.**

**Motivation:**

Our motivation for predicting solar intensity is that it is directly proportional to solar power generation. if we are able to accurately model future solar intensity given current weather data for a specified area, then that area’s solar generation output in the near future can be estimated with greater accuracy.

Overall, nearly half of aggregate solar capacity now derives from small-scale home deployments (<10kW), many of which rely on net metering to transfer surplus energy to the grid, thereby eliminating the need for expensive battery-based energy storage. As the number of home deployments grows, the need for predictive tools that provide near-term forecasts of solar generation at the time-scales of tens of minutes to days is becoming increasingly important. Solar energy forecasts have a wide range of applications. For example, smart buildings could employ forecasts for

opportunistic scheduling of elastic loads, while utilities could use them to estimate aggregate demand across a customer base with a high penetration of solar energy.

**Background:**

Solar generation depends on

1. Panel characertistcis,
2. site ,
3. surrounding ,
4. seasonal,
5. weather
6. electrical
7. GPS coordinates

Solar configuration is mainly affected by

1. Impact of weather condition
2. Impact of configuration parameter

**Objective**

**Phase I:**

1. Build effective predictor for solar intensity for a given areas 48 hours into the future using a variety of machine learning techniques.
2. Analyse the system

**Phase II:**

1. Model Construction
   1. A development of model for each solar site that learns important static and dynamic parameters of the installation.
   2. Build a live service that continuously updates both its
2. model based on fresh data and
3. predictions based on new weather forecasts.
4. Predictor model
   1. Apply machine learning algorithms to predict solar power at high data resolution. (every minute at next hour)
5. Build a IOT based service (the service also offers a webbased API to enable application developers to incorporate Solar predictions into their energy management applications).
6. Implementation and evaluation

**Dataset :**

Indian meterological dataset:

<http://www.imd.gov.in/>

**Problem Statement 2**

**Title:**

Structural Damage Classification with Machine Learning

Three stages in case of natural disaster,

Phase 1:

Pre-Disaster stage- predicting natural disaster before it happens so that precaution can be taken, emergency resource s availability can be checked etc.

Phase 2:

During Disaster stage- predicting high impact areas using social feeds, weather data, etc so that emergency services can be provided to this highly impacted areas first.

Phase 3:

After Disaster Stage-

Providing post disaster services by analysing the actual impact/destruction,people affected, areas destroyed..etc, doing structural analysis of building(as discussed in paper) to predict if they are safe or vulnerable to fall