Case Study: Wind Turbine Power

*Analytics for Engineers*

*Developed by: Scott Evans (GE Global Research)*

**BACKGROUND**

In this assignment you will be asked to develop improved models of the relationship between Y=power output of a wind turbine and the power of neighboring turbines.

A customer that has purchased a GE Upgrade to refurbish the wind turbine blades is unable to see that additional power has resulted from the upgrade. The customer has decided that the wind anemometer sensor that sits behind the flow of air may have been affected by the upgrade and would like GE to prove through analytics that the upgrade does in fact produce additional power or refund the cost of the upgrade.

You have been provided with power data from 15 days prior to the upgrade (train), and power data from 15 days after the upgrade was performed (test). Your task is to use this data to assess the turbine performance of turbine 190. Each row in the Excel files represents power measured at a single point in time, with each row separated by 10 minutes. Exact location of the turbines on the wind farm is not available.

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| **Description** | **File Name** |
| Training Data | Data\_Train\_Case\_Study\_Model.csv |
| Testing Data | Data\_Test\_Case\_Study\_Model.csv |

**YOUR ASSIGNMENT**

* It is recommended to first analyze the performance of turbine 190 compared to neighboring turbine 189. Consider the error if turbine 189 is used as an estimator of turbine 190. How well does this estimator perform?
* Now use the data from the entire wind farm to perform exploratory analysis and create a predictive model of turbine 190’s power given the power from the rest of the farm. Does this improve the estimate from above?

**YOUR DELIVERABLES**

Prepare a final report documenting your work following the case study instructions, making sure to include your recommendations.