Design Oriented Project EEE-F376  
**Plan of Work**

**Title of the project:** Calculating the Maximum Power Point of Wind Energy Conversion Systems using Machine Learning.

**I.D. No:** 2014A3PS250G – 2014A8PS775G

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**Project Instructor:** Dr. C. Balakrishna Moorthy

**Project Areas:** MPPT algorithms, Artificial Intelligence, Machine Learning, WECS (Wind Energy Conversion Systems)

**Objective:** To obtain an efficient and feasible algorithm to extract the maximum power point by implementing machine learning (ML) into perturb and observe (P &O). In this project, we explain the advantages of using ML as a modified Hill Climb Search (HCS) algorithm to obtain the maximum power point. The Controller circuit is a digitalized controller coded in High Level Language Python. This takes in previously recorded data and logs in the data captured. The controller starts learning from the data logged and starts predicting the values closer to the maximum practical achievable power. As time progresses by, the machine becomes accurate and adapts to the versatile environment conditions. As of now, we try to achieve a simulation of the same in python or MATLAB.

**Project Plan:**

1. Device complete working system/simulation with the proposed algorithm.
2. Make sufficient changes in order to improve the working of the controller.
3. To run a final simulated comparison between the normal P&O and our Modified ML architecture HCS.

**Advantages:**  
The system theoretically calculates a value of Voltage and Current faster than the normal Perturb and Observe using TSR depending upon the present Input Parameters namely wind speed , rotor frequency , air density of the surroundings.

The system self learns and becomes intelligent with time and can adapt to the surrounding climate, gradual weather changes, and also ultimately becoming more efficient and accurate.

Uses state of the technology in Machine Learning.

Uses High level Language Python / MATLAB for simulation.

**Results:**We expect the following results:

1. A highly accurate learning controller that gives Optimum Power.
2. An adaptive and faster algorithm with limited constraints.

**Efficiency and Predictability:**As part of the accuracy explained above, a variable P is included onto the learning of the machine, so as to improve and calculate the accurate value obtained from P&O. Thus, the machine learns and Updates the algorithm automatically with changes in the parameters

**Tentative Plan of Action:**

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| Date | Task | Study |
| 1/8/16 – 30/8/16 | **Simulating a WECS with Data** | **WECS, DC Generators, DC machines** |
| 30/8/16-10/9/16 | **Implementing ML in python/ matlab** | **N.A** |
| 10/9/16-20/9/16 | **Testing the Code simulation and creating plots** | **Previous Data Simulations** |
| 21/9/16- | **Possibly working on hardware simulation** | **N.A** |

**26/08/2016**