**CEI Radiometer Data Project**

Background

In late 2012 the Advanced Materials Institute installed an MFR7 rotating shadow band radiometer from Yankee Environmental Systems on the roof of the Power Plant adjacent to several types of solar panels and a test bench setup. The device collects detailed measurements of direct and indirect solar radiation at different wavelengths.

<http://www.yesinc.com/products/data/mfr7/index.html>

The radiometer is connected to a dedicated computer in a room in the Power Plant where it stores data using the Yesdas Manager software. Currently the only way to access the data is to physically copy it on to a flash drive or email it from the control machine. The Clean Energy Institute (CEI) has taken over the administration of the radiometer and data and would like to make the information available for research and education.

Possible data uses

* Solar energy engineering research. Students can collect data from experimental devices located next to the radiometer and use the radiometer measurements to explore how the new devices perform under realistic circumstances. Other research might compare the output from commercial panels installed there with the minute by minute solar data.
* Education /outreach. Currently solar generation data is available through the UW Energy Dashboard. The addition of irradiance data would give a graphic representation of the performance of the panels under typical northwest conditions.
* Interdisciplinary Research. Irradiance data is used in other disciplines such as atmospheric science, climate change, biology, agricultural research. There are national repositories and networks such as the University of Oregon Solar Radiation Monitoring <http://solardat.uoregon.edu/SiteMap.html> and the Earth System Research Laboratory http://www.esrl.noaa.gov/gmd/dv/rad/ and atmospheric radiation measurement (ARM) http://www.arm.gov/ which we could contribute data to. http://uvb.nrel.colostate.edu/UVB/

Technical Tasks

1. Set up Web server for remote access of Radiometer data using the Yesdas Data Manager. This may require IT support from UW to open up port and routing. End result will be that we can remotely access data using the existing Yesdas interface. Example site <http://134.74.16.39/>
2. Setup an automated web repository which allows anyone to download the data files for a specific period for research purposes. This might involve setting up a chron script that executes the download of files using an ftp server set up on the remote machine.
3. Setup a user friendly graphing program for archival data. Example: http://solardat.uoregon.edu/cgi-bin/PlotArchivalData.cgi
4. Setup a live feed of radiometer data so that the web site can display the current irradiance. This could be displayed on our “sun dawg” or touchscreen app.
5. Automate collection of output data from existing and experimental solar panels or devices so that it can be displayed with an app. This could be coordinated with the McKinistry panel which is being revamped.
6. Setup a graphic representation of the archival and real time output from the solar panels compared with actual irradiance. Example <http://depts.washington.edu/uwame/content/solar-panels-seattle> (manually created) and http://dashboard.mckinstry.com/uw/ (the Mckinstry dashboard is built with Dundas dashboard. The office of sustainability is interested in displaying live data as well but the Dundas system is does not appear to be open.
7. Design investigations that students can do with the available data

Qualifications

* Experience with web connectivity, ports, routing for remote instruments
* Ability to design data back end data repository
* User GUI for data downloading, query, customization of reports
* Experience design software that can graph data sets and generate outputs
* Experience with data integration protocols for sharing with other institutions or databases
* Experience with Dundas dashboard and customization.

Contact Shaun Taylor sntaylor@uw.edu