

App Development for Solar Sensor System Monitoring and Analytics

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Abstract—Utility scale photovoltaic (PV) facilities for power production are becoming increasingly common, but tools to monitor them for production and safety are lagging behind. The ongoing project has developed methods for improving facility resilience through monitoring and analytics. Part of these goals involve integrating this data into mobile technologies. This paper will discuss past work and ongoing work towards developing software for mobile platforms. First, completed work involving an app monitoring application for a small-scale PV array simulator is discussed. Next, emerging work on integrating the new utility-scale PV facility is discussed.

I. PROJECT DESCRIPTION

Past work has focused on developing mobile apps for a small solar array prototype. This tool was able to read current and voltage for 16 small PV cells and display the data on pc through LabVIEW. An Android application was developed to receive and display this data in real-time. The application and plot many or some of the many data points being collected several times per second. In future releases steps must be taken to optimize memory management.

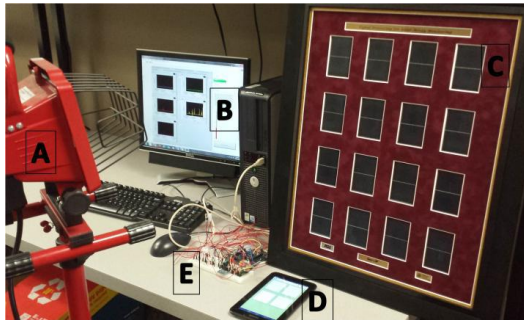


Fig. 1. A PV Array Monitoring Simulator.



Fig. 2. Remote Solar Manager Android application.

II. UTILITY SCALE TESTBED

The newly developed 18kW utility-scale experimental facility will now be the focus of development. Each of the 104 PV panels has a smart monitoring device (SMD). These SMDs are all wirelessly enabled and have dynamic switching capabilities to improve power generation and quickly recover from an array fault.



Fig. 3. Utility-scale Solar Array Testing Facility.

Future work involves interfacing with SMDs, gathering data, and publishing data to mobile platforms. An onsite industrial pc or embedded system will be used for data collection. Next a video game development platform is being used to create apps for many platforms at once. Within the end system there is potential to have not only a data platform for monitoring and machine learning analytics, but also a control platform to alter the switches and topology of the SMDs. Additional in this area is reported at [6-9]

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