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*Optimal Sensor Design for Photovoltaic Power Plants.*

Assessment of a utility scale photovoltaic (PV) power plant's potential performance is a critical aspect in the initial plant design and construction, and accurate monitoring of plant efficiency is crucial to profitable plant operation. Both assessment and monitoring rely on measurement of irradiance at the plant's location. These measurements are typically made using pyranometers which provide temporally dense, but spatially sparse data. Because plant output is directly related to total irradiance over the plant's footprint, a natural question is, "What is the optimal number and layout of sensors for predicting solar irradiance?" We propose a sensor design algorithm in an attempt to answer this question. The algorithm makes use of nonlinear time series models to determine if an optimal sensor design exists. To illustrate utility, we apply the algorithm to irradiance data collected from a 1.2 MW PV plant located in Lanai, Hawaii. (Received September 10, 2014)