NimbusAI

Honolulu, HI

Problem

Intermittent solar generation limits solar adoption and penetration into electric grids; forecasting short-term solar patterns is critical for system efficiency, reliability, and operations as more solar comes online.

Traditional forecasting uses physics simulations with dynamic downscaling and/or ensemble approaches. They are expensive and too coarse-grained for complex topographies.

Solution & Approach

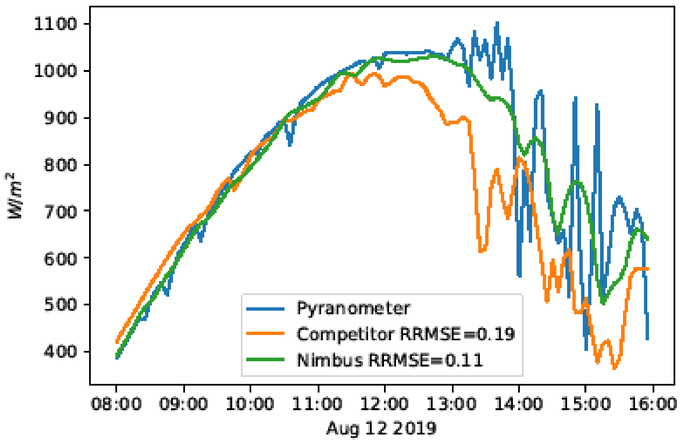
New high-resolution satellite data and machine learning techniques allow for accurate solar prediction and forecasting across the Americas without extra hardware at an unprecedentedly low cost and high speed.

We curate raw instrument data from the next generation NOAA GOES-16/17 geostationary satellites and combine it with best-practice models for clear-sky irradiance to make solar predictions. Next, our near-term solar forecasting uses these data to train convolutional deep neural networks for forecasting 10-60-minute solar patterns.

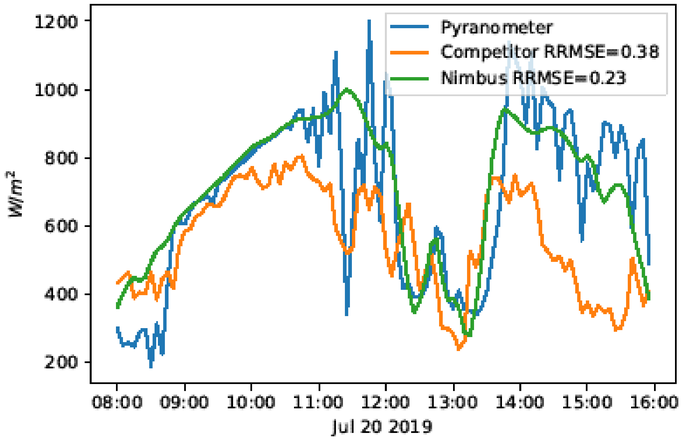
Satellite-based **machine learning** for solar prediction and **forecasting:**

- Fast & Inexpensive
- Geographically flexible
- Immediately available

Results & Competitor Comparison



Higher W/m^2 solar irradiance prediction accuracy than leading competitor: coastal Hawaiian location



RRMSE = relative root mean square error

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