Office of Innovation and Industrial Relations (OIIR)

LICENSING & PARTNERING OPPORTUNITY

جامعة حمد بن خليفة
HAMAD BIN KHALIFA UNIVERSITY
عضو في مؤسسة قطر
Member of Qatar Foundation

A Unique Approach to Solar Now-Casting

ADDRESSING GRID STABILITY

Renewable energy sources such as solar heating and photovoltaics (PVs) offer the potential to improve energy security world-wide while minimizing environmental impact. Yet power-grid integration of these sources can be challenging due to sudden shifts in solar irradiance caused by meteorological change. These sudden changes can trigger grid instability, driving the need for near-real time forecasting (or "now-casting") of solar irradiance.
However, no single now-casting model can consistently account for all potential weather trends at every time of year.

A MULTI-MODEL, ADAPTIVE SOLUTION

HBKU has addressed this shortcoming with a novel approach to solar now-casting that leverages diverse forecasting approaches from multiple models.
The method employs machine learning to classify and select the best forecasting model based on prevailing conditions.
This forecast-classify-select approach has been shown in field testing to consistently deliver more reliable and accurate predictions than single-model forecasting methods.

APPLICATIONS

- Solar energy integration and management
- Grid-tied solar power generation
- Utility scale solar farms

VALUE PROPOSITIONS

Accurate: Leverages diverse forecasting approaches in order to arrive at superior predictions

Enabling: Addresses the power-grid integration challenges of PVs and other solar and renewable energy sources, which may help promote wider adoption of these technologies

Intelligent: Enables use of several modeling techniques as forecasting methods – individually, superposed, or in combination – including Persistence, Support Vector Regression, and autoregressive models

Proactive: Provides forecasts of solar irradiance shifts to optimize power resource allocation, ensuring grid balance and preventing power surge damage.

Demonstrated: Outperforms other forecasting methods, with a 48% improvement over the Persis-tence baseline and 22% over the best single-model approach.

PATENT STATUS

Patent US11,063,555 / US201801755790A1 has Granted

LICENSING OPPORTUNITIES

Hamad Bin Khalifa University is offering this technology for license.

For more information, please contact: innovation@hbku.edu.qa