Solar Generation Forecasting

NICTA

More and more Australians are relying on the benefits of solar power, however the impact to electricity grid stability needs to be determined.

Further uptake of solar panels is at risk as electricity grid operators grapple with the instability caused by overflow solar energy entering the grid.

NICTA's Solar Generation Forecasting project is using sensor data from solar panels on residential houses across the city of Canberra to predict future energy production. The ability to predict energy production is the first step in enabling power grid operators to be able to ensure the quality and control of electricity supplies in an environment of greater solar panel usage.

Project Background

Seeking to solve the problem of the unpredictability of solar generation, NICTA is installing data loggers on residential solar systems across Canberra. 'Skycameras' are also being set up on the top of buildings to capture information about cloudbursts.

Energy production by solar panels is intermittent when it is cloudy.

Weather satellite images are not sufficient to predict solar energy output to the grid at a suburb or even finer locale level.

The data loggers will measure the real energy production of the inverter on the solar panel systems and send this information back to a central analysis platform every five minutes.

NICTA developed skycameras to record images of cloudbursts which is key to determining impacts of clouds on generation.

What is the technology?

Data samples collected from the loggers and skycameras are entered into powerful machine learning algorithms that will predict the energy output from solar panels across the entire city of Canberra over time.

By receiving information about the amount of energy distributed solar systems are giving back to the grid, grid operators will have the necessary data to put measures in place to control fluctuations on the grid as solar panel uptake increases. Ideally data from the system will be made available in real-time to all interested energy market participants.

NICTA's unique approach

NICTA is attempting to create a highly granular prediction capability for solar energy generation in Australia which will allow grid operators to better forecast the intermittency of solar generation and plan for alternatives in times of lower generation.

Collaborators

Australian National University

University of Central Florida

University of California

armada solar

LAROS Technologies

It's how we connect

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The Solar Generation Forecasting Project is part of the Security and Environment Business Team, creating and safeguarding an environmentally sustainable Australia.

Research Excellence in ICT
Wealth Creation for Australia

NICTA

Leading the Way

NICTA is Australia's Information and Communications Technology (ICT) Research Centre of Excellence, driving innovation through high quality research, research training, commercialisation and contract research.

NICTA has the largest concentration of ICT researchers in Australia. Our research focuses on use-inspired basic research that benefits industry, the community and the national interest.

Since NICTA's inception in 2002, NICTA has built strong research capability in:
- Software Systems
- Networks
- Machine Learning
- Computer Vision
- Optimisation.

Our Business Teams are the market focus of our research capabilities:
- Broadband and the Digital Economy
- Infrastructure, Transport and Logistics
- Security and Environment.

NICTA researchers work on Business Team projects supported by:
- An Engineering and Technology Development Team
- IP, Legal and other professional support.

Our work as a world-class research institute and Centre of Excellence in science and innovation brings together many of Australia's and the world's top ICT researchers. NICTA provides them with the facilities and support they require, making imagination to impact a reality.

NICTA's unique approach fosters and develops ICT research. We work closely with both industry and other research institutions to solve problems and make breakthroughs in ICT with real impact. NICTA's focus on use-inspired research means our projects have direct relevance to the challenges faced by business, government and individuals around the world. The result is breakthrough technologies that provide commercial opportunities and have a positive impact on Australia's export earnings.

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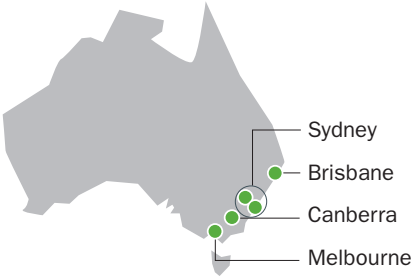

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