Managing Demand Response and Renewables in Smart Grid

Kyle Kastner

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Presenter

Dr. Nikolaos Gatsis

What is the research trying to do?

Dr. Gatsis' research is focused on smart grid scheduling using convex optimization techniques.

Articulate the objectives using absolutely no jargon

Scheduling of smart appliances is a critical objective for the "smart grid", and is crucial for future growth.

How is it done today, and what are the limits of current practice?

Currently, no scheduling at all is performed (at least at the grid level), which results in huge amounts of inefficiency and waste for both consumers and producers of electrical power.

What's new in the approach and why do we think it will be successful?

This scheduling is currently done using convex optimization techniques, built from special models for different types of devices.While convex methods may not fully cover all the problems, they are a very good start for stepping into the future of electrical distribution.

Who cares?

More efficient electrical distribution affects every single person who uses electricity, as reducing electrical waste can save money for every customer.

If successful, what difference will it make?

We will be able to use electrical energy more efficiently, reducing fossil fuel consumption, saving costs in both infrastructure and bills. It also increases the effectiveness of green energy sources.

What are the risks and the payoffs?

This research is fairly low risk, as there is little existing literature. The payoff may be enormous, if a highly efficient scheduling algorithm is created, tested, and adopted in industry.

How much will it cost?

Simulated testing of this research will cost nearly nothing, as the improvements are algorithmic.

Is it economically feasible?

It will be many years before a solution is implemented, and current limitations for the smart grid are lack of infrastructure, complex politics, and consumer buy-in. However, this research is important in making sure that good technical solutions are available when these other issues are solved.