Building a better thermostat

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An algorithm developed and field-tested by ORNL researchers uses machine learning to maintain homeowners' preferred temperatures year-round while minimizing energy costs. Credit: ORNL, U.S. Dept. of Energy

Oak Ridge National Laboratory researchers designed and field-tested an algorithm that could help homeowners maintain comfortable temperatures year-round while minimizing utility costs.

The algorithm learns over time to keep the home at residents' desired temperature settings while minimizing energy costs and adjusting to environmental conditions, all with no existing knowledge of the building. Results suggest the algorithm could save homeowners as much as 25% on annual utility bills.

"We found it's not practical to try to create a different model for each individual building across a neighborhood or city," ORNL's Helia Zandi said.

"We wanted an algorithm we could apply to different buildings that would automatically learn the characteristics of the environment and how to minimize operating costs while maximizing comfort."

The team's goal is to make the model universal so it can adapt to any system with the least amount of data necessary.

Provided by Oak Ridge National Laboratory