

# Warming up to the future with Nest thermostat

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During cold spells, Andy Law likes to keep his San Jose, Calif., house warm and toasty, which used to be a problem whenever the 29-year-old Yahoo mobile app designer traveled out of town.

He'd sometimes forget to turn down the thermostat and run up a nasty heating bill by the time he returned. But he hasn't had to worry about

that since buying one of Google's Nest thermostats.

Typically selling for \$249, the device "learns" its users' daily heating and cooling preferences, including when they're away. Then it mimics those temperature variations on its own, which was just what Law was looking for.

"There's things that I'd much rather do with my time than be worrying about a thermostat," he said. "It's kind of a cliché, but I like the idea of setting it and forgetting it. If more of the products in my life could do that, that would be great."

In fact, companies are developing a wide array of smart devices - from refrigerators to coffee pots - that will tailor their functions to what they learn about their users' needs. It's all part of the so-called Internet of Things. But many of these gadgets are still on the drawing board, so the Nest thermostat provides an intriguing example of what is fast coming down the road.

Officials at Google Inc., which bought Palo Alto, Calif.-based Nest Labs for \$3.2 billion earlier this year, say the gadget's proprietary algorithms and sensors give it the brainpower to understand what its owners want.

"The first three to four days is when it's most eager to learn," said Maxime Veron, director of product marketing for Nest. "It's going to start looking for patterns. It gathers data, temperature and the time it was set. Also occupancy, whether someone was home or not, and it crunches this information."

After four days, Nest learns enough about its human user to keep the house as hot or cold as the person generally prefers at different times during the day. The temperature can still be adjusted manually or with a smartphone, but by then, the device has learned a schedule and is slow to

modify it.

One feature that will click in about a week after Nest starts learning is its "Auto-Away" function, which automatically adjusts the thermostat to reduce the heating or air conditioning when no one is there. Nest motion sensors detect when the user has left the house, and if it knows from experience that no one else lives there, Nest will automatically adjust the temperature to whatever the person previously has indicated they prefer when they're gone.

During the winter on weekdays, for example, Nest might lower the temperature several degrees from 9 a.m. to 6 p.m., because it knows the homeowner usually is at work then. But it's careful not to make a hasty assumption, according to a Nest blog.

"If you're always home in the afternoons, but Nest senses no activity at 1 p.m., then it may wait two hours before turning on Auto-Away. That way Nest can ensure that you're really gone, not just watching a movie in the living room."

Moreover, the blog said, "if you're gone for longer than two days, Nest will start ignoring all the temperatures on your schedule. It assumes you're on vacation and won't be coming home anytime soon."

The Auto-Away sensors also are designed to scan a room for movement "above most pets' heads," so it doesn't mistake a dog or cat for a person and assume someone is still in the home. But the thermostats can be fooled by large pets.

"Between a Great Dane and a small child, we can get confused," Veron said. "It happens."

Another feature many people seem to like is "Nest Leaf," which gives

the user feedback whenever the temperatures they set save energy. So if the person manually raises the [temperature](#) sufficiently on a hot day or down on a cool one, a green leaf appears on the [thermostat](#).

Yahoo app designer Law says he knows he is saving money with Nest. Although he's not exactly sure how much, "it's substantial enough to notice."

Not everyone is enamored with the gadget. Some people have grouched that it is not without glitches and is too expensive. But after trying it out, PC Magazine contributing editor John Delaney hailed it "a must have for high-tech homeowners or anyone looking to save on heating and [air conditioning](#) costs."

Law agrees, noting that Nest also is cool looking.

"I've seen other products that try to be smart, but they don't do it in an elegant way," he said. Nest, he added, "is like a piece of art on your wall. You could almost put a frame around it."

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