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Researchers at the University of Washington solve one of the issues the Internet of Things poses by 3D-printing plastic objects with built-in wifi capabilities-- no power source or electronics required!



"Our goal was to create something that just comes out of your 3D printer at home and can send useful information to other devices," a team member says. "But the big challenge is how do you communicate wirelessly with wifi using only plastic? That's something that no one has been able to do before."

The team 3D-printed three wifi-enabled objects-- a weighing scale, a flow sensor and an anemometer able to measure wind speed using commercially available plastics and wifi receivers. A combination of 3D-printed springs, gears and switches (based on the same principles allowing battery-free watches to keep time) translates motion into antenna-transmitted data, while backscatter techniques reflect radio signals emitted by a wifi router or other devices.

A receiver built out of a conductive printing filament decodes the information found in the reflected pattern, and physical motion (such as the push of a button, flowing liquid or a turning knob) triggers gears and springs in the 3D-printed object to change the reflective state of the antenna. The faster the gears spins, the more rapidly signals are transmitted.

Also printed by the team are 3 widgets-- a button, knob and slider-- able to talk to other smart devices using the same principles, as well as detergent bottle with an attached flowmeter able to track the amount of remaining detergent and order when it gets low, and a test tube holder able to measure the amount of liquid test tubes contain and track inventory. Another interesting development is a means to print iron into 3D objects in distinct patterns, allowing devices such as a smartphone to "read" information about it.

The public can already 3D-print the objects themselves, and the curious can learn more about the team's findings through the links below.

Watch 3D Printing Wireless Connected Objects

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