

Scientists Want to Use People As Antennas to Power 6G

Why? Because your body is pretty great at harvesting wasted energy.



By [Tim Newcomb](#) Published: Jan 06, 2023 3:16 PM EST



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- The future of [6G](#) telecommunications could come from Visible Light Communication.
 - Researchers at the University of Massachusetts Amherst believe [using humans](#) as part of the antenna system offers the most efficient way to harvest waste energy.
 - In the process, humans could wear coiled copper.
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We don't yet know exactly how [6G wireless technology](#) is going to work. But researchers at the University of Massachusetts Amherst believe using humans as antennas to power 6G may be the most viable way to harvest additional energy that would otherwise get wasted.

In the always-present effort to speed up informational exchange, scientists have already started investigating Visible Light Communication (VLC), basically a wireless version of fiberoptics, that uses flashes of light to transmit information. Adding VLC to 6G spurred the UMass Amherst team to dig even deeper.

First, some background on 6G. As a refresher, [5G](#)—what is considered the fifth, and most recent generation of cellular broadband networks—is still in its infancy. True 5G networks operate in millimeter-wave frequencies between 30 and 300 Gigahertz, which are 10 to 100 times higher frequency than previous 4G cellular network. (Some cell phone providers cheat, however, by claiming the upper end of the 4G spectrum as 5G).

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The definition of these cellular generations are defined by a global partnership known as [3GPP](#). Given the history of the never-ending march of technology, it's inevitable that 5G will be replaced by a new network in the future. It just isn't entirely clear what 6G will be.

In the meantime, in the [new study](#), the UMass Amherst scientists found that humans can play a crucial role in making VLC more efficient by using their bodies as a carrier for coiled copper to catch waste energy from VLC. Lead study author Jie Xiong, UMass Amherst professor of information and computer sciences, [explains](#):

“VLC is quite simple and interesting. Instead of using radio signals to send information wirelessly, it uses the light from LEDs that can turn on and off, up to one million times per second.”

LEDs bulbs can then transmit data, and “anything with a camera, like our smartphones, tablets, or laptops could be the receiver,” Xiong says.

The downside of VLC comes from a high rate of “leakage” of energy with the emitting of side-channel radio wave signals. The researchers believe that if they can harvest the wasted radiofrequency (RF) energy, they can put it to good use by powering small electronic devices.

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After experimenting with wires, coils, and backgrounds, the scientists realized the human body offers the best medium—up to 10 times better than any other setting tested—for amplifying a copper coil’s ability to collect leaked RF energy. They then built the Bracelet+—an inexpensive gadget that is meant to be worn on the forearm, but can adapt into a ring, belt, or necklace—to harvest lost energy. The coiled copper Bracelet+ can reach up to micro-watts, enough to support on-body health monitoring sensors, which require little power to work, the team says.

Coupling the copper coils with VLC systems uses humans as antennas to power up the technology they use.

“Ultimately,” Xiong says, “we want to be able to harvest waste energy from all sorts of sources in order to power future technology.”

Additional reporting by Tim Childers



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Tim Newcomb is a journalist based in the Pacific Northwest. He covers stadiums, sneakers, gear, infrastructure, and more for a variety of publications, including Popular Mechanics. His favorite interviews have included sit-downs with Roger Federer in Switzerland, Kobe Bryant in Los Angeles, and Tinker Hatfield in Portland.