Tiny Micro-Robotic Windmill Recharges Phone Batteries

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A UT Arlington research associate and electrical engineering professor have designed a micro-windmill that g phone batteries constantly in need of recharging and home energy generation where large windmills are not

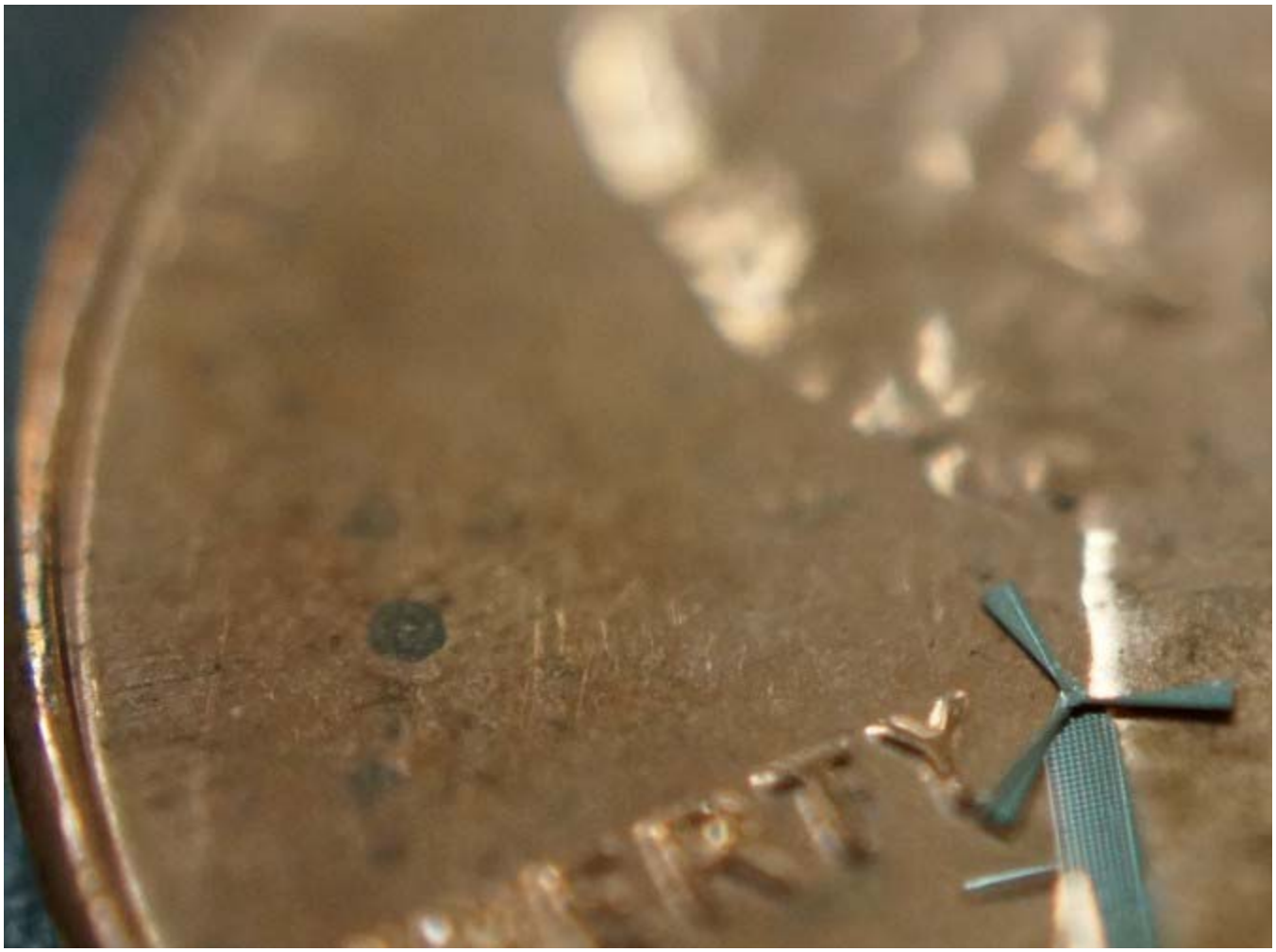
Smitha Rao and J.-C. Chiao designed and built the device that is about 1.8 mm at its widest point. A single g windmills could be embedded in a sleeve for a cell phone. Wind, created by waving the cell phone in air or hc electricity that could be collected by the cell phone's battery.

Rao's works in micro-robotic devices initially heightened a Taiwanese company's interest in having Rao and company's fabrication techniques, which are known in the semiconductor industry for their reliability.

"The company was quite surprised with the micro-windmill idea when we showed the demo video of working them and their investors."

Rao's designs blend origami concepts into conventional wafer-scale semiconductor device layouts so comple two-dimensional metal pieces utilizing planar multilayer electroplating techniques that have been optimized b took an initial interest in Rao's work.

"The micro-windmills work well because the metal alloy is flexible and Smitha's design follows mi for



One of Rao's micro-windmills is placed here on a penny. (Credit: University of Texas at Arlington)

UT Arlington Research Associate Smitha Rao.

WinMEMS became interested in the micro-electro mech
Company representatives visited with the UT Arlington

An agreement has been established for UT Arlington to
commercialization opportunities. UT Arlington has appli

Currently, WinMEMS has been showcasing UT Arlingto
micro-windmills, gears, inductors, pop-up switches and
human hair.

These inventions are essential to build micro-robots tha
zones or manufacturing tools to assemble micro-machi

“It’s very gratifying to first be noticed by an international company and second to work on something like this
earned her Ph.D in 2009 at UT Arlington. “However, I think we’ve only scratched the surface on h e m

The micro windmills were tested successfully in September 2013 in Chiao's lab. The windmills operate under the durable nickel alloy and smart aerodynamic design.

"The problem most MEMS designers have is that materials are too brittle," Rao said. "With the nickel alloy, w

The micro-windmills can be made in an array using the batch processes. The fabrication cost of making one wafer, which enables for mass production of very inexpensive systems.

"Imagine that they can be cheaply made on the surfaces of portable electronics," Chiao said, "so you can pla battery power, all you need to do is to put on the sleeve, wave the phone in the air for a few minutes and you

Chiao said because of the small sizes, flat panels with thousand of windmills could be made and mounted on or environmental sensing and wireless communication.

He added that it has been fulfilling to see his former student succeed and help move innovation toward the m

"To see a company recognize that and seek you out for your expertise speaks volumes about what UT Arling

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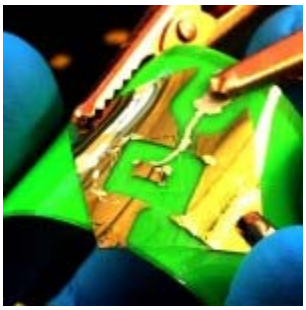

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