

Wireless energy harvesting and storage in textiles

Brief Overview

Energy storing and harvesting textiles are currently being developed at Drexel University. Antennas are tuned to harvest or scavenge energy at 2.4 GHz from the WiFi frequency band. The antenna is fully knitted from conductive yarns on industrial knitting machines. The antenna is connected to a small circuit that can collect the harvested signals for specific applications. This harvested energy can either be used to power other textile devices, or can be stored in a supercapacitor, which is embedded in the same piece of fabric. Custom fitted pockets can be made to house non-textile components, and conductive leads can be knitted as a part of the fabric to connect all system components.

Applications

- Power other wearable electronics
- Power small portable electronics
- Can be incorporated into interiors to store charge collected from other renewable sources
- Flexible and stretchable electronic applications

Advantages

- Passive system, no need for the wearer to be moving to harvest energy
- When no WiFi is available, devices can draw power from the energy storage device
- Mass customization in terms of size, material, and device configuration
- Manufacturing processes are readily scalable

Intellectual Property and Development Status

Patent application covers materials, manufacturing methods, and applications. Sample materials have been created on industrial looms and are available for inspection.

Commercialization Opportunities

Drexel is currently seeking commercial partners to license and/or sponsor research to further develop this technology.

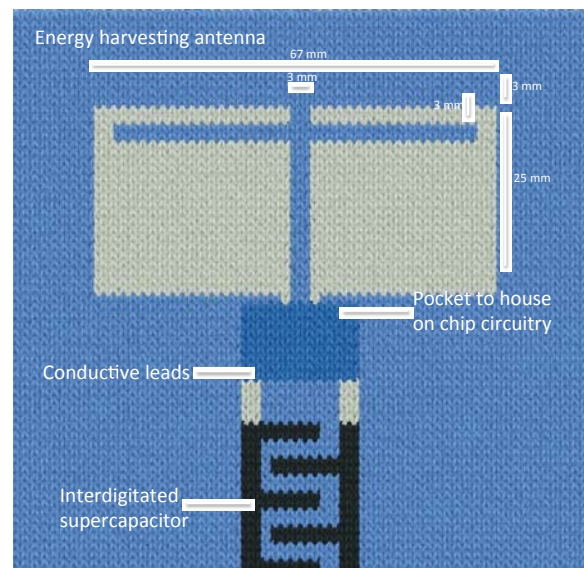


Figure: Schematic for an antenna connected to a supercapacitor made as a single sheet of fabric.



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Web Site

<http://nano.materials.drexel.edu>

<http://drexel.edu/excite/research/shimaSeiki/>

<http://wireless.ece.drexel.edu/>

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