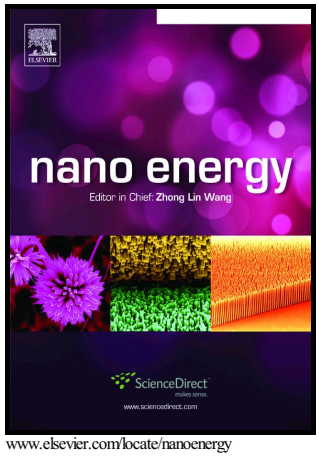

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PII: S2211-2855(18)30100-9
DOI: https://doi.org/10.1016/j.nanoen.2018.02.033
Reference: NANOEN2520

To appear in: *Nano Energy*

Received date: 27 December 2017
Revised date: 15 February 2018
Accepted date: 15 February 2018

Cite this article as: P. Maharjan, R.M. Toyabur and J.Y. Park, A Human Locomotion Inspired Hybrid Nanogenerator for Wrist-Wearable Electronic Device and Sensor Applications, *Nano Energy,* https://doi.org/10.1016/j.nanoen.2018.02.033

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ABSTRACT

The availability of realistic, wearable efficient energy harvesters for powering body-worn IoT devices and health monitoring sensors is essential, in order to reduce the dependence of these wearable electronic devices, on batteries. Herein, we demonstrate a novel curve-shaped wearable hybridized electromagnetic-triboelectric nanogenerator (WHEM-TENG), operating as a fully-enclosed light-weight low-frequency energy harvester, driven by human motion. The WHEM-TENG incorporates the swinging behavior of a human arm during locomotion, and the freestanding rolling mode of a magnetic ball. Simulations of the magnetic flux density and the triboelectric surface potential assisted in improving the design and performance of the nanogenerator. The harvester device was manufactured using a 3D-printing method, which makes the fabrication process faster, easier, and more cost-effective than traditional methods. The 3D-printing material was used as triboelectric material for the nanogenerator. Experiments illustrate that at the low input frequencies characteristic of