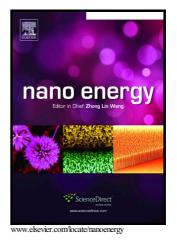
## Author's Accepted Manuscript

A Human Locomotion Inspired Hybrid Nanogenerator for Wrist-Wearable Electronic Device and Sensor Applications

P. Maharjan, R.M. Toyabur, J.Y. Park



 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 2017Revised date:15 February 2018Accepted 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

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

## A Human Locomotion Inspired Hybrid Nanogenerator for

#### Wrist-Wearable Electronic Device and Sensor **Applications**

P. Maharjan, R. M. Toyabur, and J. Y. Park\*

Department of Electronic Engineering, Kwangwoon University, Seoul, Republic of Korea.

nuscri \*Corresponding author. Email: jaepark@kw.ac.kr (J. Y. Park)

### 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 3Dprinting 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 Download English Version:

# https://daneshyari.com/en/article/7952851

Download Persian Version:

https://daneshyari.com/article/7952851

Daneshyari.com