Knowledge Transfer Office
香港城市大學
City University of Hong Kong

Technology Brief of CityU's IP

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- A Thermoelectric Device (IDF#733, US16/668,174)

[Ref.: https://www.sciencedirect.com/science/article/pii/S037877532030286X]

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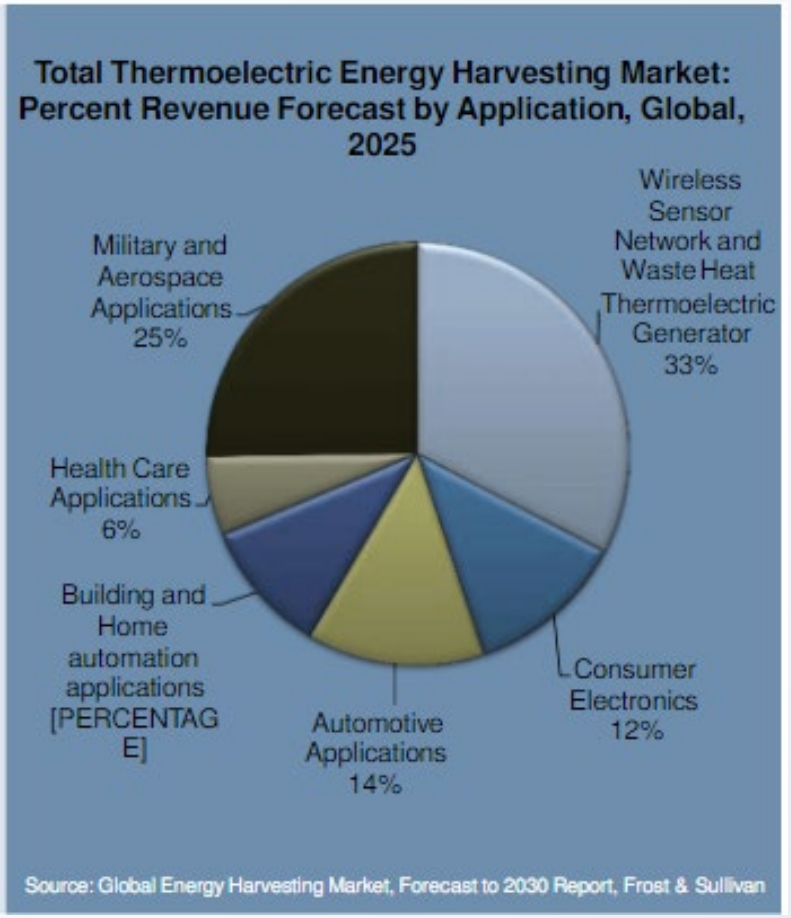
A Thermoelectric Device

Background:

- Concerns of disposal, environmental-friendly and capacity limitation about battery powering electronic devices/apparatus

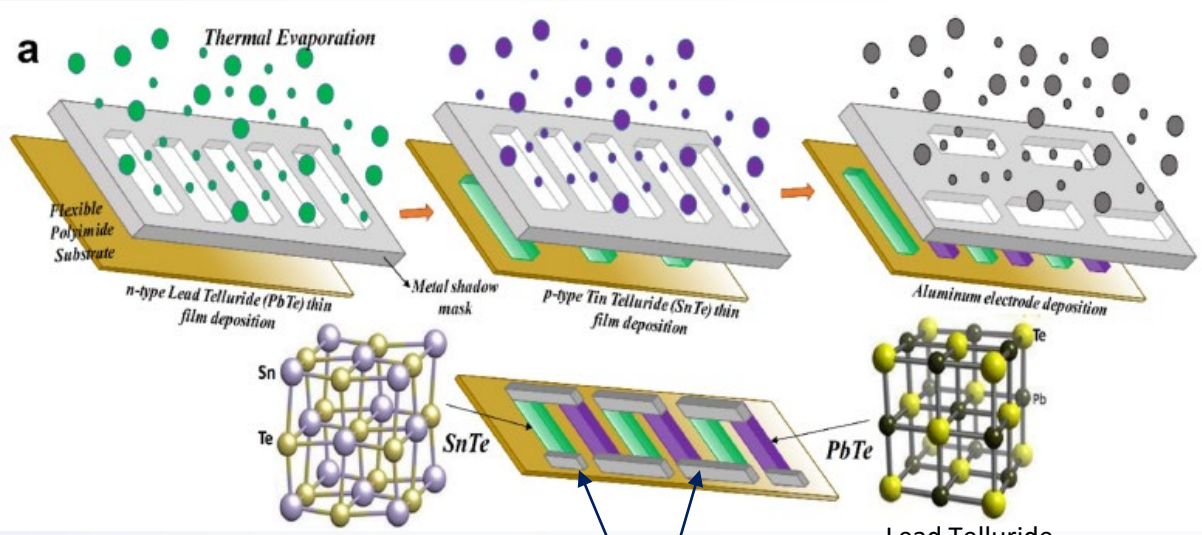
Thermal energy harvesting utilizes temperature differences or thermal gradients for generating electricity. Heat flow occurs between n- and p-type materials, electrically joined at a high temperature junction, and therefore the flow of charge from the high temperature to low temperature end. This establishes a voltage difference across base electrodes proportional to the temperature difference.

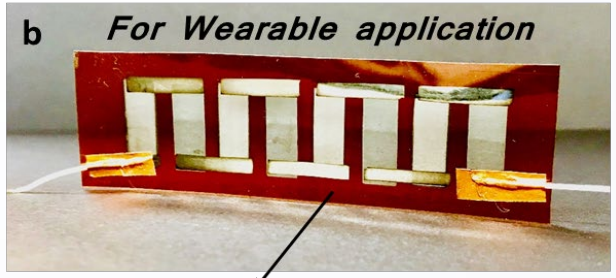


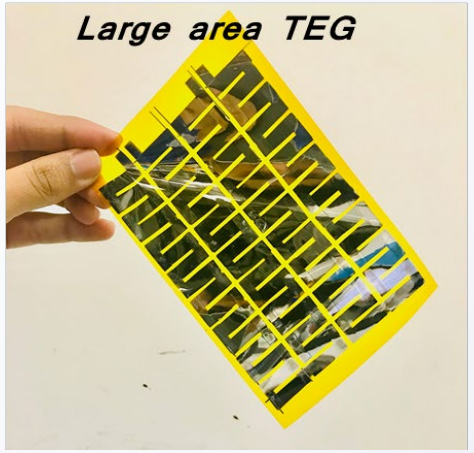
A Thermoelectric Device

Technology:

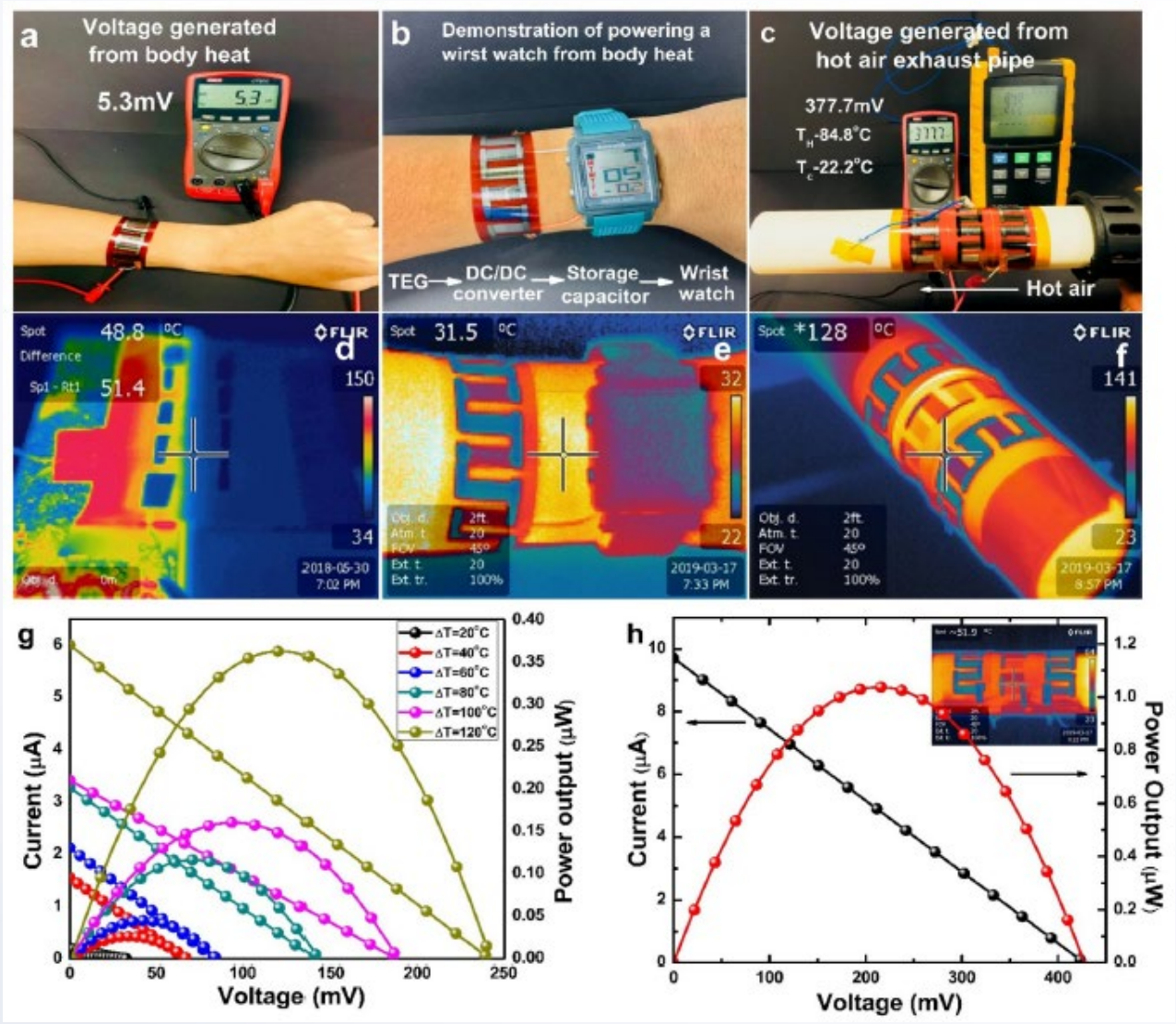
- A wearable thermoelectric device and its fabrication method converts heat to electricity

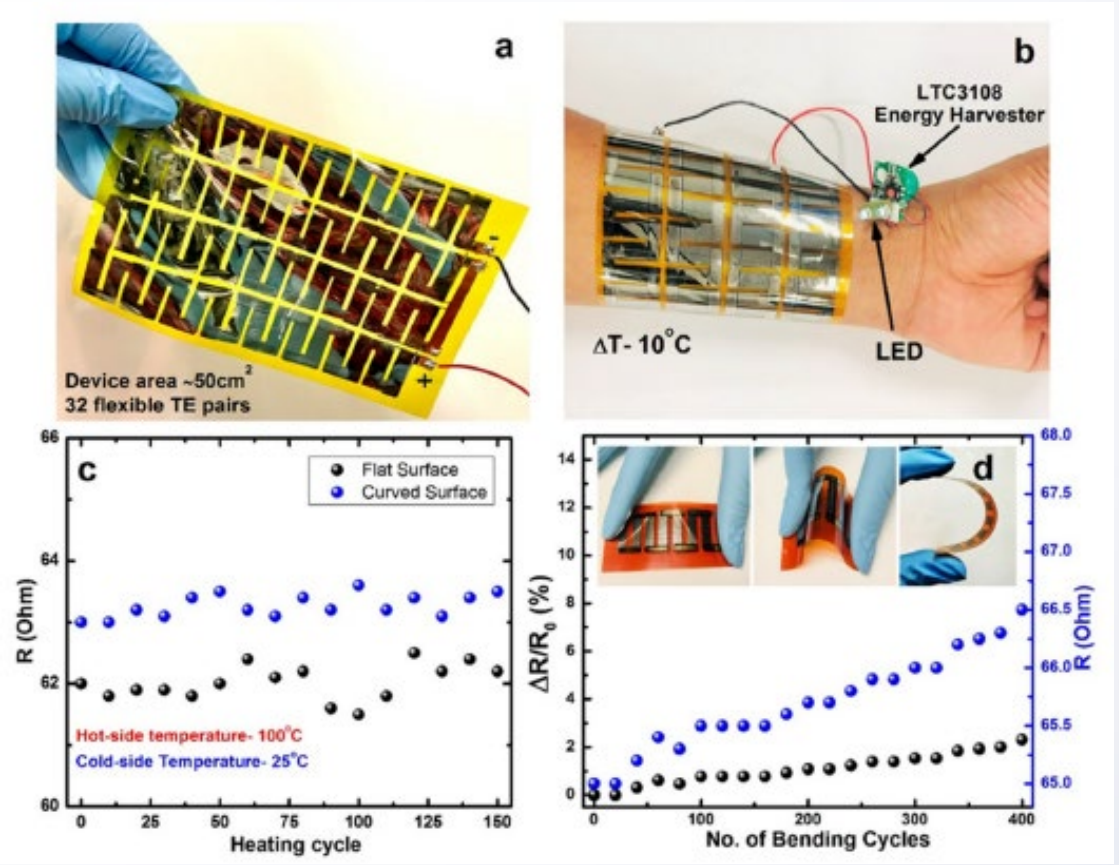






A Thermoelectric Device





A Thermoelectric Device

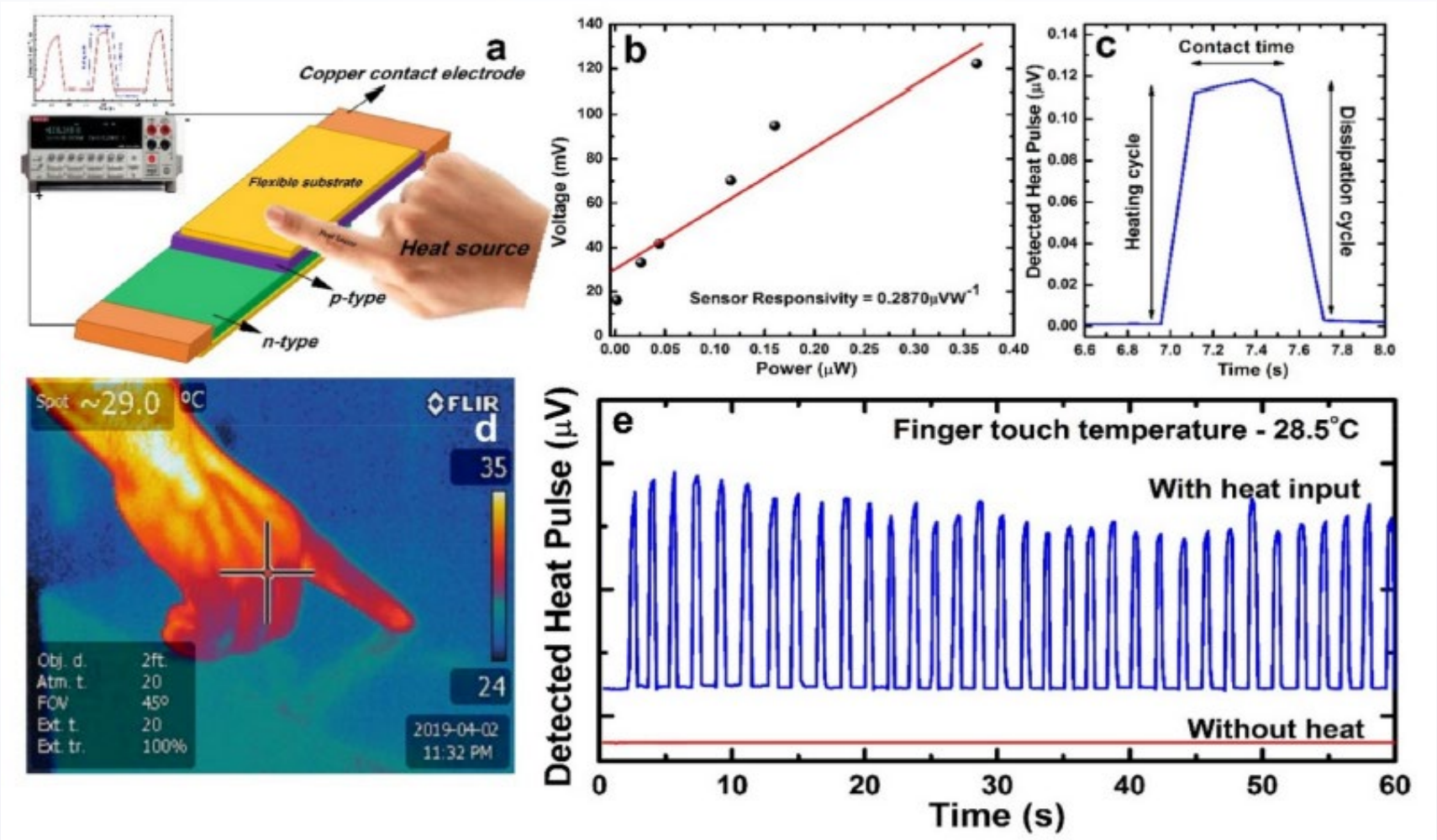


Fig. 6. Thermal touch sensor (a) schematic diagram shows the construction of flexible thermal touch sensor (b) shows the sensor responsivity [25] (c) Electrical response of the heat touch-induced pulse signal [67] (d) IR image of the figure touch (e) compares the electrical pulse signal from the sensor for with and without heat input at ambient atmosphere.

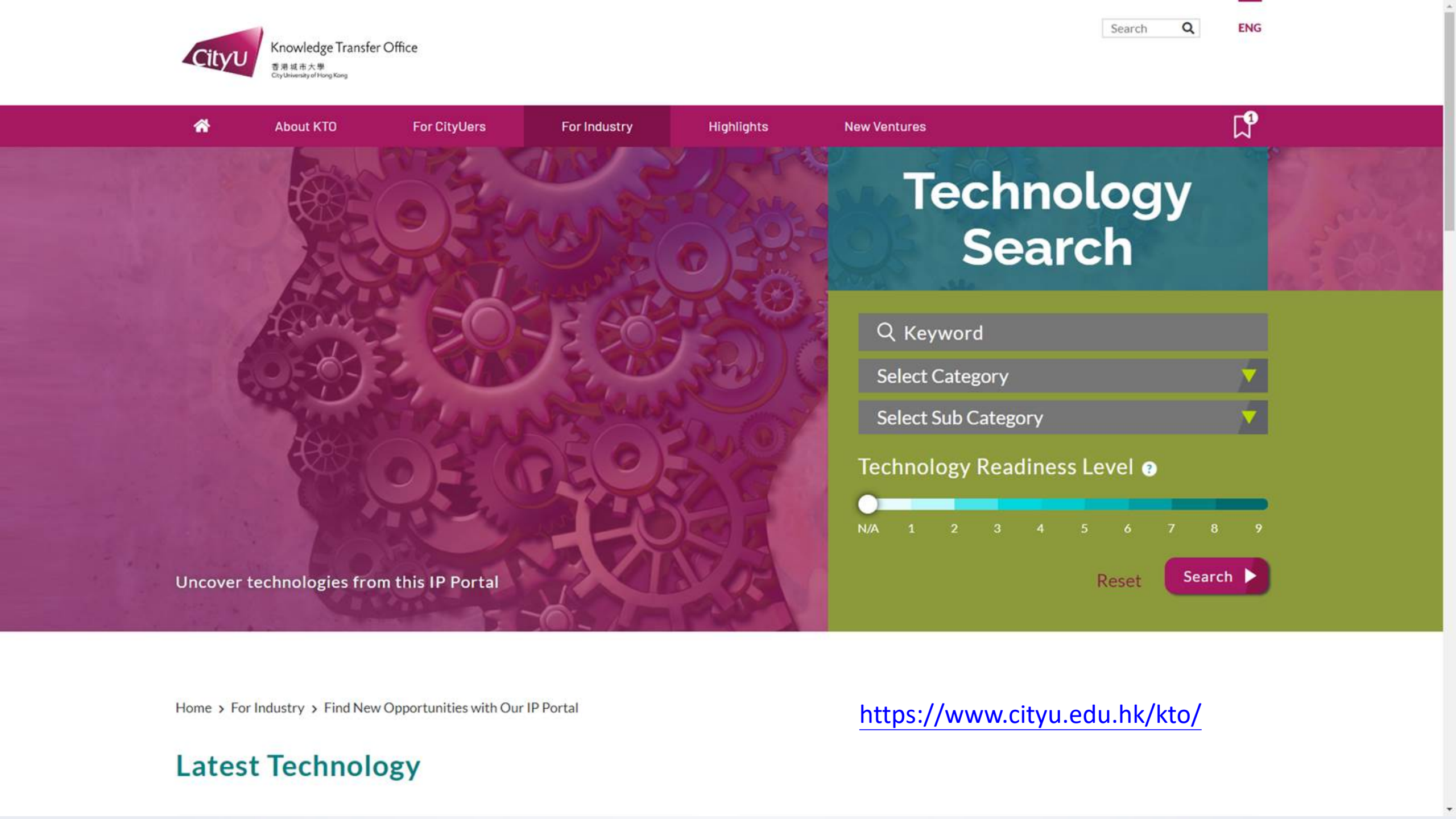
A Thermoelectric Device

Advantages:

- It continuously and efficiently generates electrical power as long as exposed to heat, even the low grade of body heat
- Unlike a battery having finite capacity due to chemicals, its power output has no capacity limit
- Higher temperature gradient generates greater current and power

Applications:

- Touch sensor for fast switching and high sensitivity, such as touch heat mapping or imaging applications
- A standalone senor/device not able to be supported by battery/ cabling-electricity



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Latest Technology

Thank you!

Q & A