

Is it Possible to Design a Battery as Bio-Fuel Cells for Charging the Smart Phone using Thermal Radiation of Human Body? A New Proposal

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Abstract

All objects including the human body emit electromagnetic radiation, whose wavelength is related to the temperature of the object, so this radiation is sometimes called thermal radiation. A smart phone is a computing platform portable device, which combines mobile telephone and computing functions e.g. video, cameras, and gaming. Usually the temperature of human body is stable, so that the amount of thermal radiation is also stable. A battery can be designed and is used in the smart phone, then, anytime it will be convenient to charge the battery as bio-fuel cells with stable amount of thermal radiation. It is a new proposal in this study.

Keywords: Electromagnetic Radiation; Thermal Radiation; Smart Phone; Bio-Fuel Cells.

1. Introduction

All objects, including the human body, also emit electromagnetic radiation (or electromagnetic waves), whose wavelength is related to the temperature of the object, so this radiation is sometimes called thermal radiation [1]. Most of the thermal radiation emitted by the human body has a wavelength of about 12 microns (1 micron = 10⁻⁶ meters), which is infrared (wavelength 0.75 to 1,000 microns), which is longer than the wavelength of visible red light, thereby this electromagnetic wave is called infrared. That is, electromagnetic waves other than red light. The amount of thermal radiation emitted by an object is related to its surface temperature, area and characteristics. Objects with higher temperatures emit a larger amount of thermal radiation. Portable ear probes or forehead infrared thermometers detect infrared rays to measure body temperature. Infrared cameras used for quarantine at airports, ports and border crossings can also quickly check whether passengers have symptoms of fever.

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Therefore, the amount of thermal radiation depends on the temperature variants. However, when the amount of thermal radiation is independent on the temperature variants [2] and then amount of thermal radiation is stable. Therefore, then such amount can be designed as the source of energy. In this paper, an idea is proposed, that is, to design a battery of smart phone.

2. Smart Phone

A smart phone is a computing platform portable device, which combines mobile telephone and computing functions (Figure.1). It is the hardware with capabilities and extensive mobile operating systems. It facilitates wider software, internet and multimedia functionality e.g. video, cameras, and gaming [3]. Smart phone is necessary for our life today. However, its battery is a very important issue. To design a battery of smart phone, temperature of human body is considered under the condition of stable temperature. Usually the temperature of human body is stable with stable amount of thermal radiation. When such a battery is designed and is used in the smart phone, then, anytime it will be convenient to charge the battery as bio-fuel cells [4] with stable amount of thermal radiation like.



Figure 1: iphone11 (source: <https://www.apple.com/hk/>)

3. Conclusion

All objects, including the human body, also emit electromagnetic radiation. Therefore, this radiation is sometimes called thermal radiation. A smart phone is a computing platform portable device, which combines mobile telephone and computing functions. It is the hardware with capabilities and extensive mobile operating systems. Smart phone is necessary for our life today. However, its battery is a very important issue. Usually the temperature of human body is stable with stable with stable amount of thermal radiation. A battery as bio-fuel cells for smart phone is designed and is used, then, anytime it will be convenient to charge the battery using stable amount of thermal radiation

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4. Conflicts of Interest

The author Jyh-Woei Lin declares that there are no conflicts of interest.

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