HARNESSING ENERGY FROM HUMAN MOTION USING MECHANICAL ENERGY HARVESTER

REPUBLIC POLYTECHNIC

PROJECT OBJECTIVES

This project aims to develop a vibrational energy harvester capable of harnessing energy from motion. The energy generated will be transferred to and stored in an energy storage device (e.g. Li-Ion battery) via a power management circuit. Eventually, we hope to develop a wearable energy harvester prototype that can charge up portable electronic devices (e.g. mobile phones) through human motion.
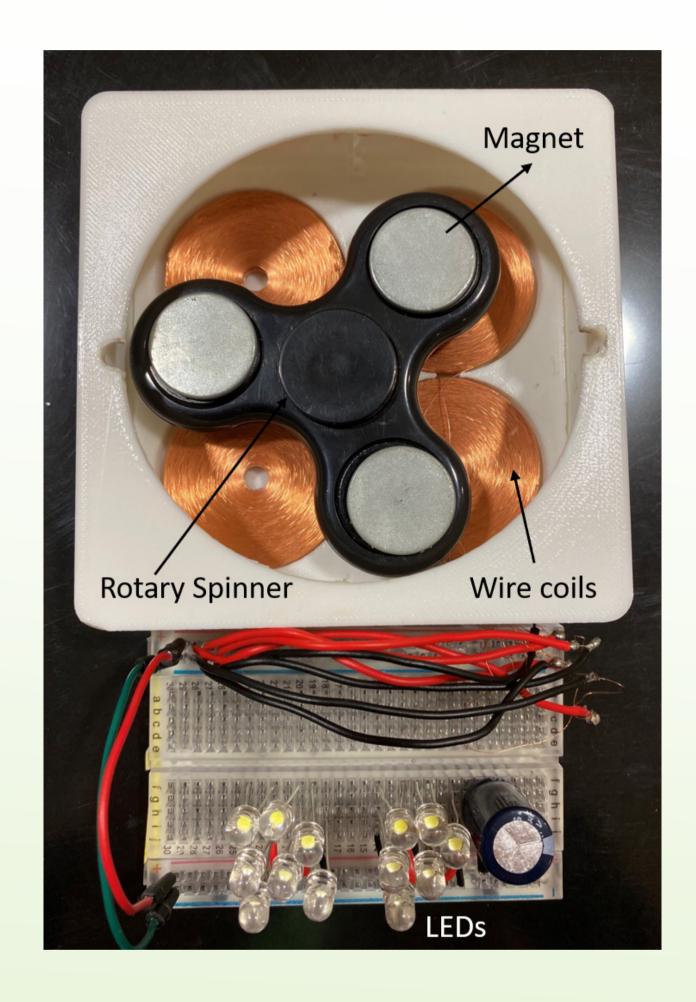
PROJECT SUMMARY

Energy scavenging is becoming an interesting way of powering our electronic devices. With the proliferation of wearables in recent years, the harvesting of ambient energy is being increasingly studied due to its almost infinite supply and low carbon footprint.

For this project, the team has designed, fabricated and assembled an energy harvester capable of generating energy via electromagnetic induction. Magnets are mounted on a spinner, with electromagnetic coils placed below. When the magnets spin, energy is generated. This energy generated is able to light up at least 7 LEDs at the same time. We are planning further enhancements to the project, including incorporating an additional mechanism to harvest more energy, an electronic circuit to manage and store the energy generated and improving on the ergonomics of the prototype.

PROJECT OUTCOMES

At the end of the project, we hope to develop a working energy harvester with a novel energy harvesting mechanism. The harvester will store the energy from walking, running, cycling and other movements to provide energy for charging wearables and mobile electronic devices. We are targeting to create at least 2-3 hours of standby smartphone battery life with an hour of exercise.

ENERGY HARVESTER LIGHTING UP LEDS FORMING RP WITH CAPACITOR

ENERGY HARVESTER LIGHTING UP LEDS FORMING RP

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