

Harnessing Energy from Human Motion using Mechanical Energy Harvester

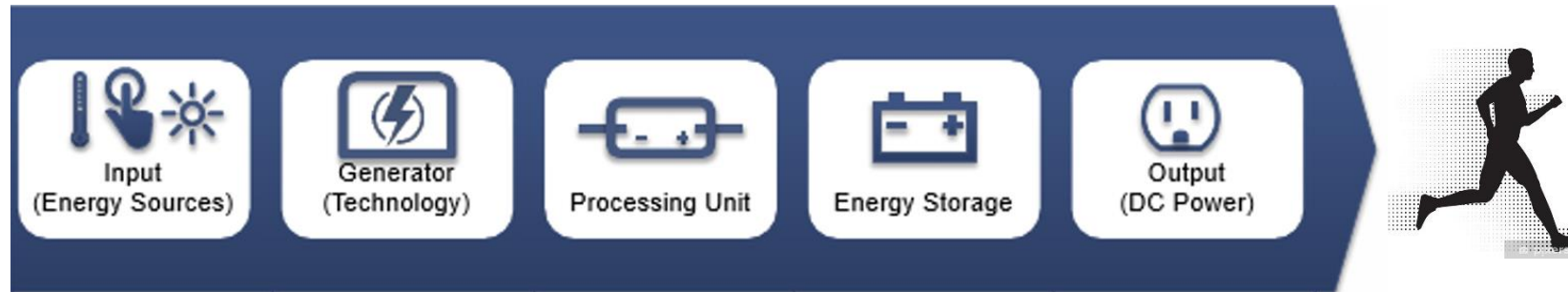
School of Engineering

Diploma Electrical & Electronic Engineering (DEEE)





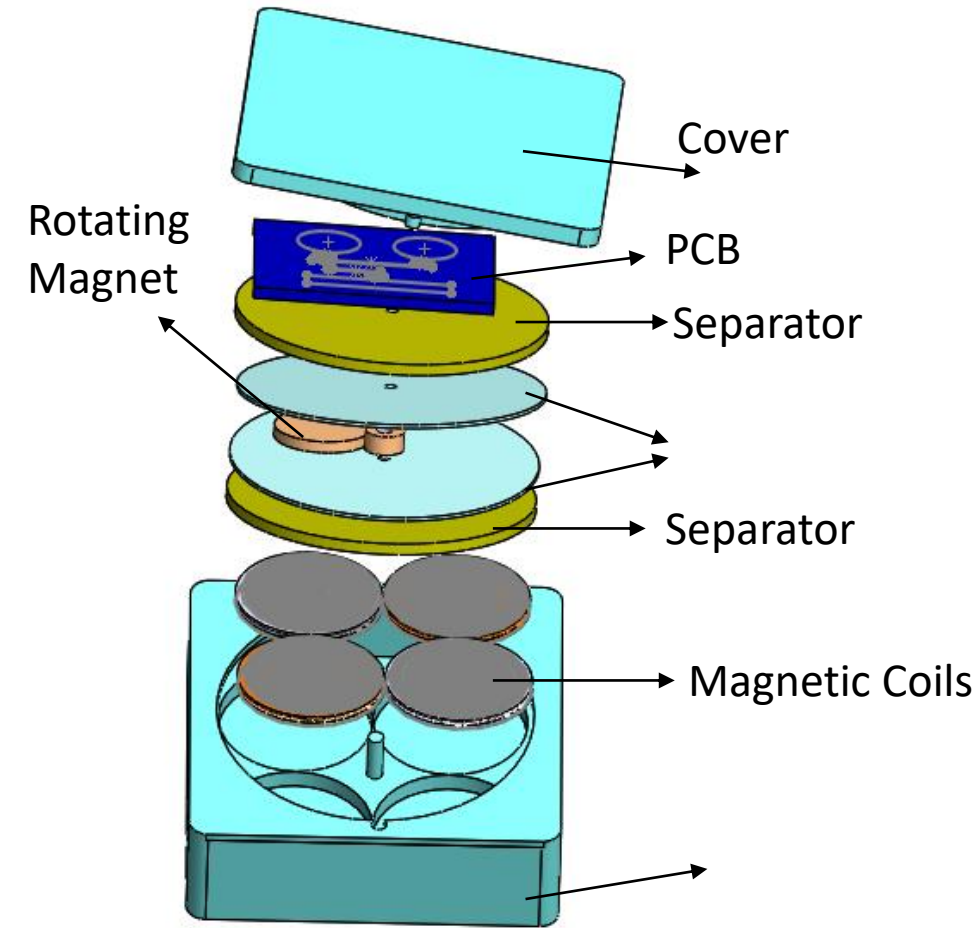
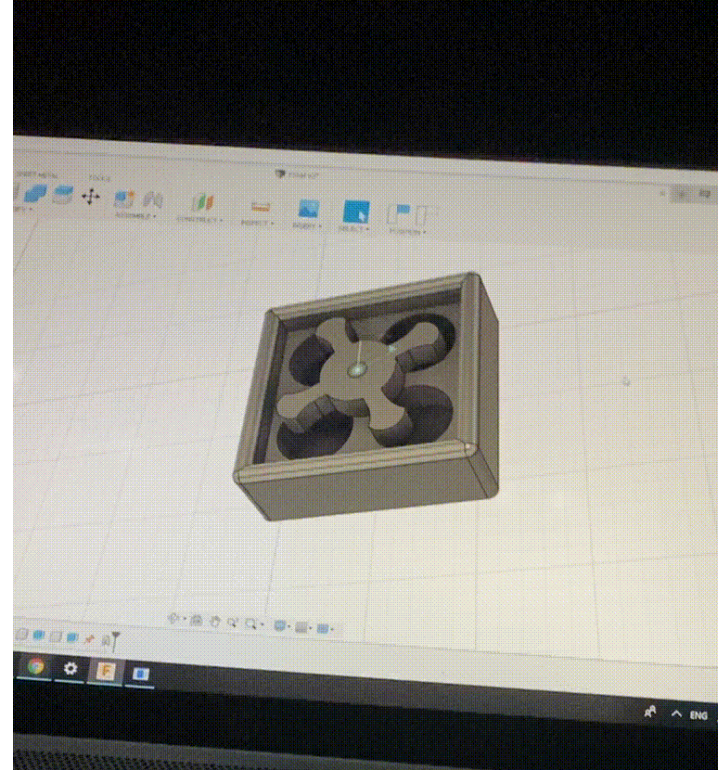
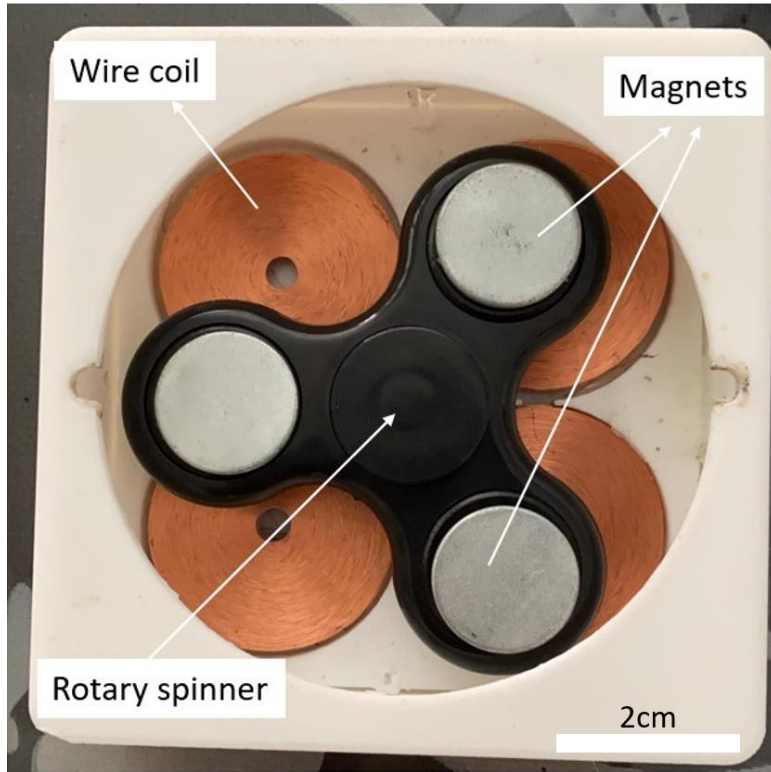
Project Objectives



- Develop a portable vibrational energy harvester (VEH) that is capable of generating energy from human motion or vibration.
- Transfer the generated energy into a power management circuit consisting of rectifier and energy storage e.g. supercapacitor, Li battery.
- Assemble the VEH and power management circuit into a portable prototype that can be worn by user in the form of armband or wristband, taking into consideration of human factor engineering.

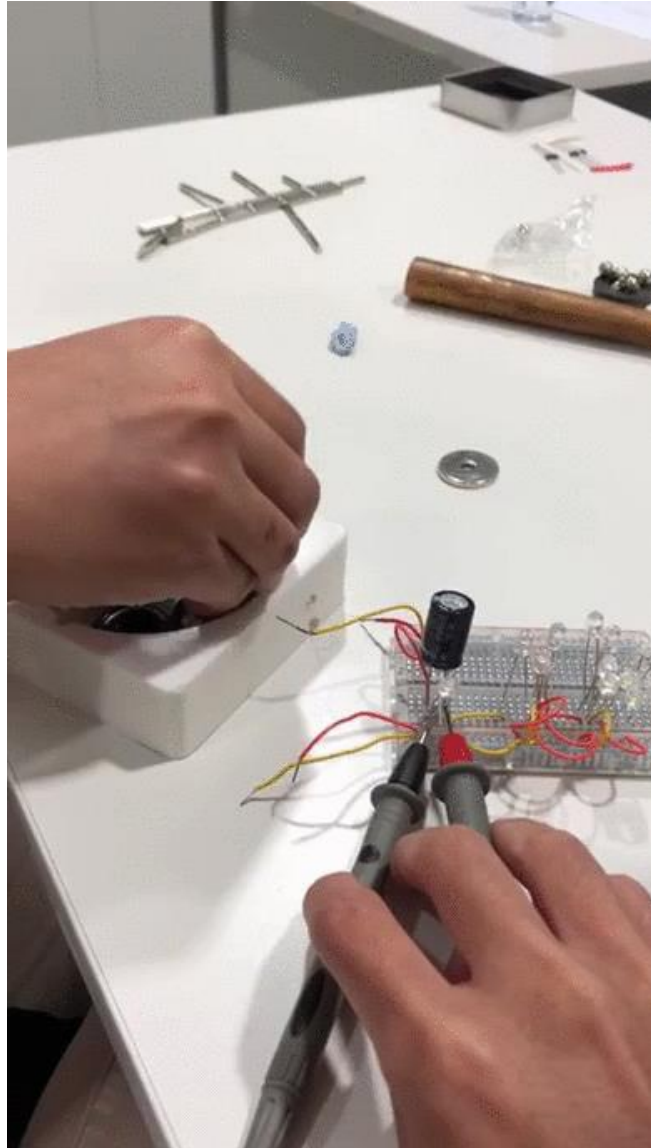


Vibrational Energy Harvester Prototype





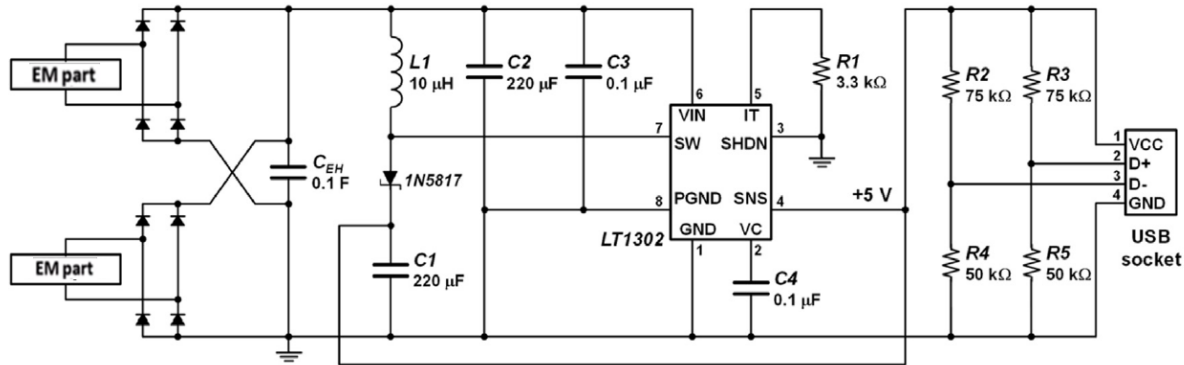
Vibrational Energy Harvester Characterization Results



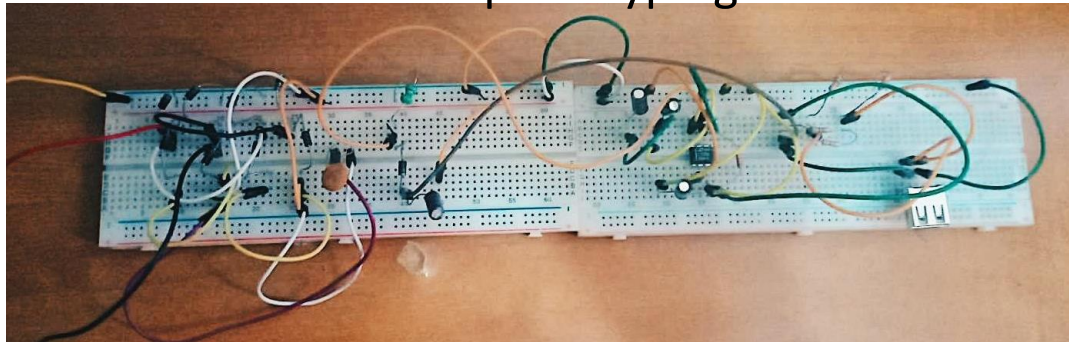


Power Management Circuit

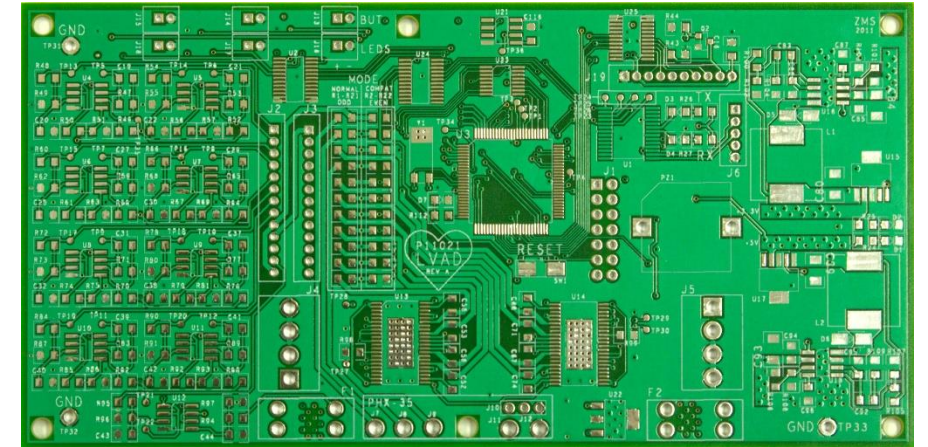
Schematic Circuit



Breadboard prototyping



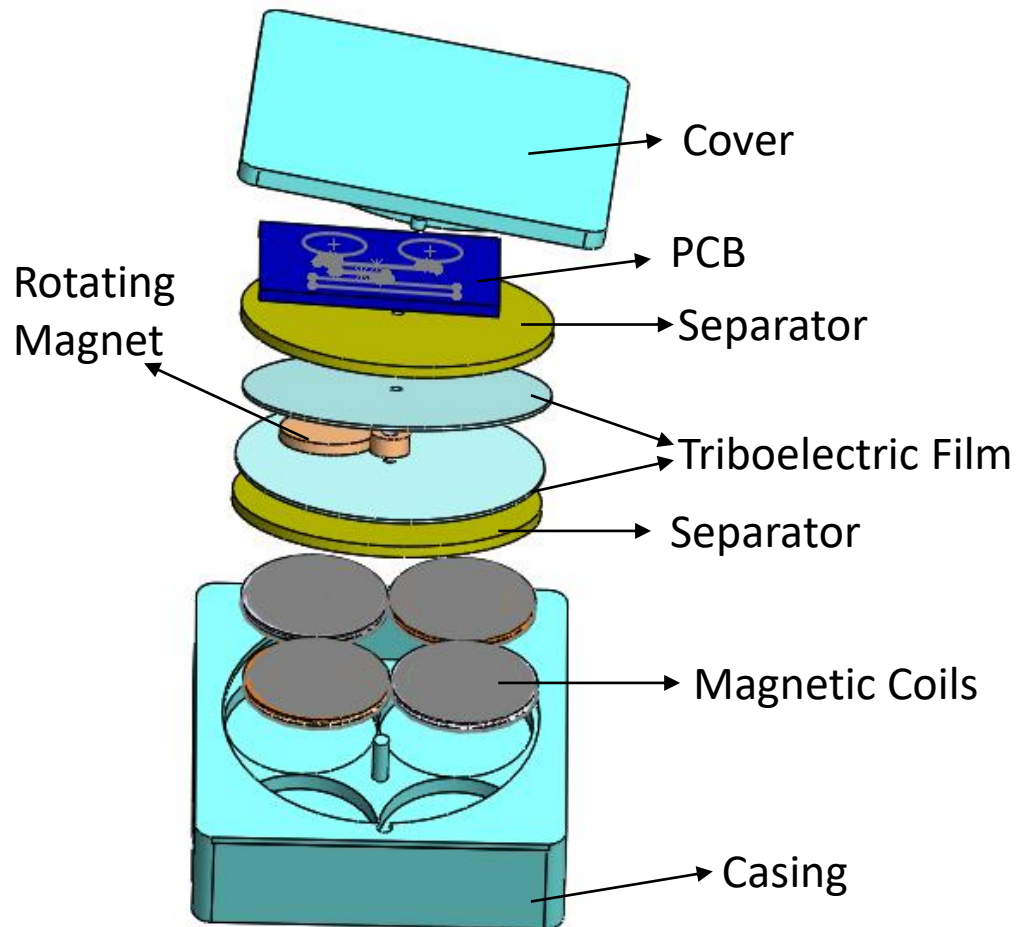
Printed Circuit Board (PCB)



Future Work



Unique Selling Points of Prototype



- Hybrid electromagnetic and triboelectric energy harvesting mechanisms allow more energy to be harness simultaneously.
- Design allows energy to be harnessed at low *frequency* (<10Hz) in non-resonant mode.
- Integrated energy storage (using PCB) allows energy harvested to be stored and provide a complete package for product commercialization



Eventual Project Goal



An example illustrating how our final prototype could possibly be worn as an armband during exercise to generate energy and serves as a portable energy source

THANK YOU

