Project Title: Design and fabrication of vibration energy harvester

Supervisor's Name: Musaab Zarog

Co-Supervisor(s): *(if already known)*

Sources of Fund: self

Research Field(s): Energy harvesting

Summary and Problem Statement:

Keywords: Electromechanical systems, power generators, Energy scavenging, Piezoelectric energy

Objectives: Developing high power broadband micro energy harvester

Tentative Methods of Approach:

1- Investigating and measuring the ambient mechanical vibration (e.g. level and frequency of vibration and the broadband range)
2- Geometrical design of the vibration structure using ANSYS Workbench or COMSOL.
3- Design of integrating vibrating element and energy harvesting element for power production
4- Design optimization of the vibrating structure and the harvesting element (through e.g. material selection, shape, dimensions,..etc) for maximum power output.
5- Design optimization for broadband vibration frequencies
6- Design and development of experimental setup
7- Carrying tests and measurement at SQU (Mechanical and Industrial Engineering department)
8- Carrying tests and measurement at SQU (Mechanical and Industrial Engineering department) for the MEMS device.
9- Analyzing results and suggesting improvements
10- Results documentation

Required backgrounds and skills

Backgrounds:

Mechanical, electrical, or electronic engineering degree. Or degree in physics

Computing Skills:

Other requirements:

References:

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