Acknowledgement

MANUFACTURING TECHNOLOGY

CRANFIELD INNOVATIVE MANUFACTURING RESEARCH CENTRE

Energy Harvesting Technology to Power Wireless Sensors For Aircraft Structural Load Monitoring

IMRC Innovative Manufacturing Research Centres

Students: A Giuliano and V Marsic

Project team: Dr Meiling Zhu, Dr M Pozzi, Prof. S Williams, Dr I Durazo-Cardenas & Dr X Zhang

Introduction

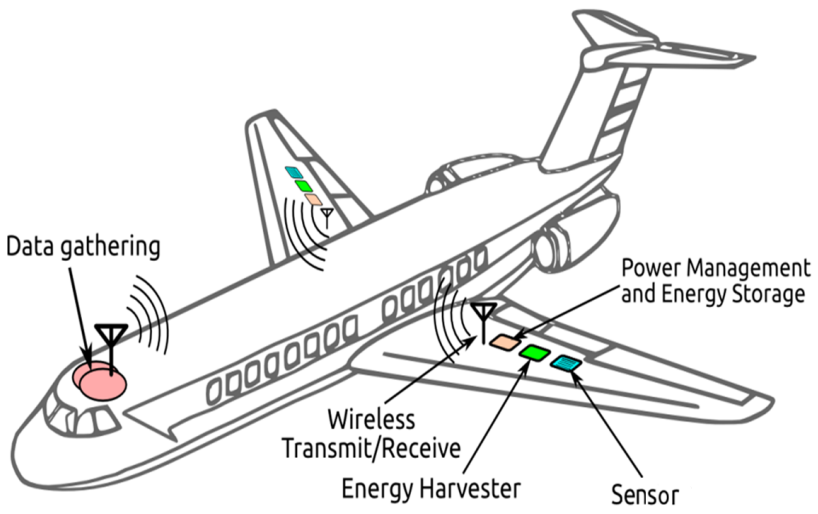
The Piezoelectric Energy Harvesting (PEH) Group within the Microsystems and Nanotechnology Centre at Cranfield University, through the Cranfield Innovative Manufacturing Research Centre (IMRC) financial support (IMRC-137) between 2009 and 2010, has designed and prototyped PEH devices with a cantilever structure, and achieved a maximum output power of 370μW/cm^3 at 15.5volts into a 325kΩ resistive load at the resonant frequency of 87Hz and under an acceleration of 0.23g. The achieved power value is very high and has the potential of being used to power wireless sensors and/or wireless sensor networks.

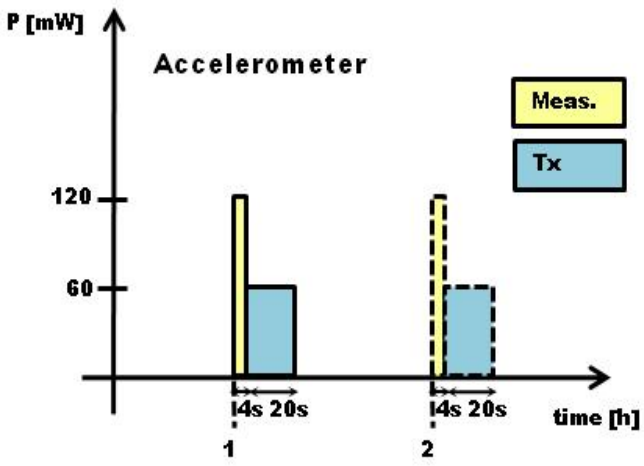
This project will be the follow-on research of Project IMRC-137.

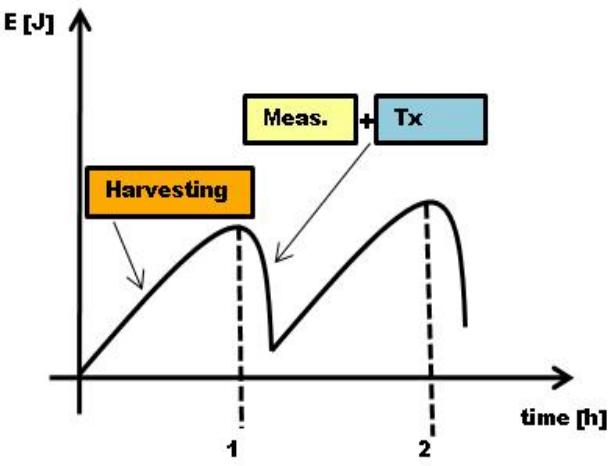
Aims

- Develop PEH technology with wireless sensing for the applications of aircraft structural load monitoring
- Transfer this technology to different industrial sectors, such as automotive and transport industry for engines, gear boxes and bearings monitoring

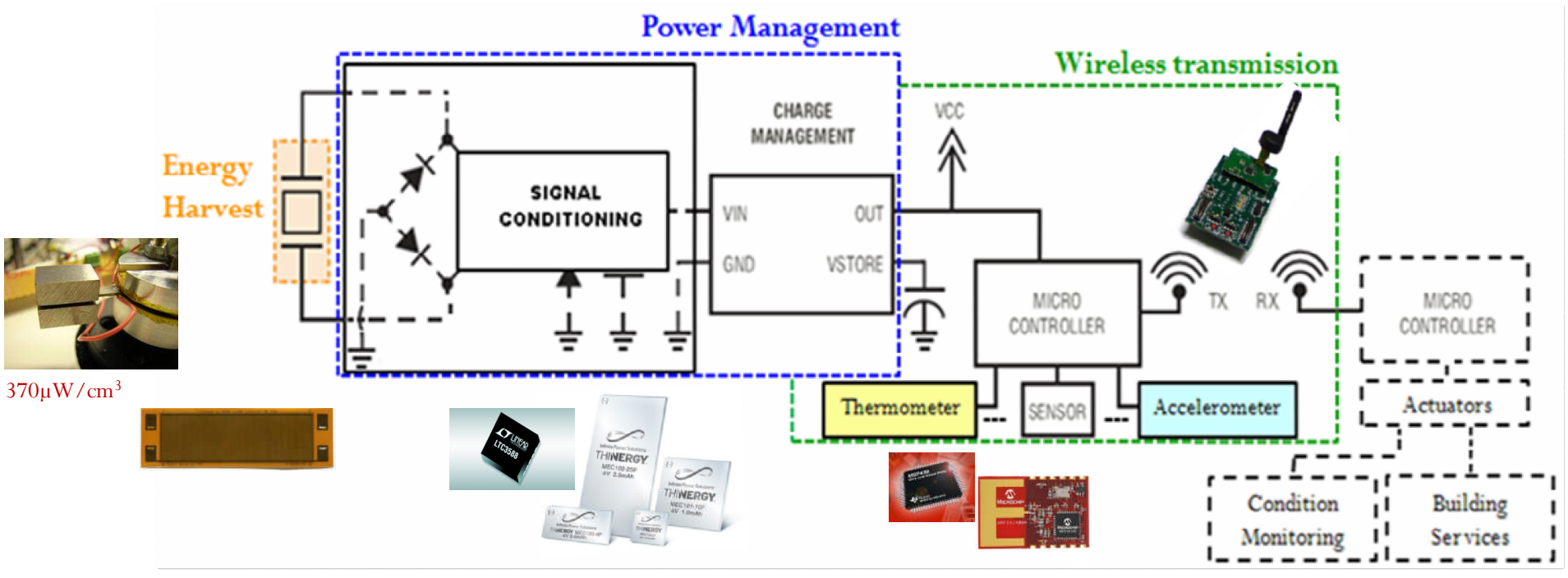
What are we developing?







Piezoelectric Energy Harvester + Power Management + Wireless Sensing



Contact details:
Dr. Meiling Zhu
Cranfield University
Bedfordshire
MK43 0AL UK
Tel: 01234750111-2092
m.zhu@cranfield.ac.uk

Summary

- The system will give structural health managements (SHM) easy access to up-to-date asset information for better decision making.
- The developed technology will enable SHM systems to be completely autonomous to run without constantly maintenance.

For further information please visit www.cranfield.ac.uk/imrc

Cranfield UNIVERSITY

IVHM

BOEING

EPSRC

Engineering and Physical Sciences Research Council