

Division of Electrical Engineering and Computer Science	Research field	Magnetostrictive energy harvesting and actuator	Lab. ID
			EC19
Laboratory web site	http://vibpower.w3.kanazawa-u.ac.jp/index-e.html		
Research subjects			
Vibration based power generation technology which extracts electrical energy from ordinary vibration of automobile, machine and infrastructure, and motion of human and object. The device using iron-based magnetostrictive material features simple, highly robust, high efficient and low output impedance. This technology realizes battery-free wireless sensor system and remote useful for health monitoring of bridge and factory machine, and prevention of crime and disaster.			
Master/Doctor course: Education policy, curriculum, typical activity in the laboratory			
Policy of instruction is developing independence and activity. Students are required to master basis and application of electrical circuit, electromagnetics, power electronics, vibration, material mechanics, energy conversion, smart material and structure, magnetic, circuit design and analysis, and manufacturing. Students develop abilities of information gathering, subject and goal setting, experiment and calculation, writing and presentation via research activity. Seminar is held once a week to present and discuss about research progress.			
Daily life in the laboratory, etc.			
Students are provided individual PC and enough space for experiment. Facilities for manufacturing, experiment and calculation are completed. Students must concentrate into research activity from 10 a.m. to 5. p.m. (core time) and are required to do more experiments to get good results. Laboratory room is equipped with television, refrigerator, microwave oven and sofa to spend comfortable research life.			
Message or comments by the laboratory faculty staffs			
Vibration based power generation technology is growing up rapidly and will realize battery free IoT near future. The ability and knowledge to learn via research activity will be useful in work of engineer. Join our laboratory and enjoy research with us.			
Recent Master theses in these 3 years (+ more if appropriate)			
year.month	Thesis title (including English translation of Japanese thesis title)		
2021.3	Study on battery-free self-sensing wireless system using magnetostrictive vibration power generation		
2021.3	Research on output improvement of multi-mass magnetostrictive vibration power generation device by approaching resonance frequency		
2020.3	Battery-free temperature / humidity wireless sensor by door movement using magnetostrictive vibration power generation		
2020.3	Optimal design of two-degree-of-freedom magnetostrictive vibration power generation device		
2020.3	Battery-free wireless sensor using magnetostrictive shock vibration power generation		
2020.3	Scale up of magnetostrictive vibrational power generator for power regeneration		
2019.3	Output improvement by magnetic circuit of magnetostrictive vibrational power generator for resonance frequency control		
2019.3	Development of wind vibrational power generator for battery-free IoT application		
2018.3	Development of battery-free acoustic monitoring system using magnetostrictive vibration generator		
2018.3	Study on battery free wireless sensor system by improving efficiency of magnetostrictive vibration power generator		
2018.3	Study on wide frequency bandwidth of magnetostrictive vibration power generator using coupled vibration and its application		
2018.3	High sensitization of magnetostrictive vibration generator and its application to floor power generator		
2017.3	Study on wide operation frequency band magnetstrictive vibration power generator using nonlinear effect and its application		
2016.9	Study of resonant frequency tuning of magnetostrictive vibration energy harvesting using spring constant adjustment		
2016.9	Research on application of magnetostrictive impact power generation for sports equipment		
2016.3	Resonant frequency control of magnetostrictive vibration power generation for bridge health monitoring		
2016.3	Study on high power output of Magnetostrictive Impact Power Generator using two degree of freedom system		
2016.3	Study on Magnetostrictive Power Generation System Using Wave Energy in Seawall		

2016.3	Improvement of Efficiency of Magnetostrictive Vibration Power Generator Considering Magnetic Properties
2015.3	Wideband of magnetostrictive vibrational power generator by multi resonant mechanism
2015.3	Improvement of efficiency of magnetostrictive vibrational power generator considering structure, magnetic and electrical coupling
2014.3	Study on battery-free remote using magnetostrictive vibrational power switch
2013.3	Wideband of magnetostrictive vibrational power generator by frequency up converter
2013.3	Improvement of efficiency of magnetostrictive vibrational power generator by flame shape
Recent Doctoral theses in these 3 years (+ more if appropriate)	
year.month	Thesis title (including English translation of Japanese thesis title)
Laboratory mail address	
	Toshiyuki Ueno <ueno@ec.t.kanazawa-u.ac.jp>