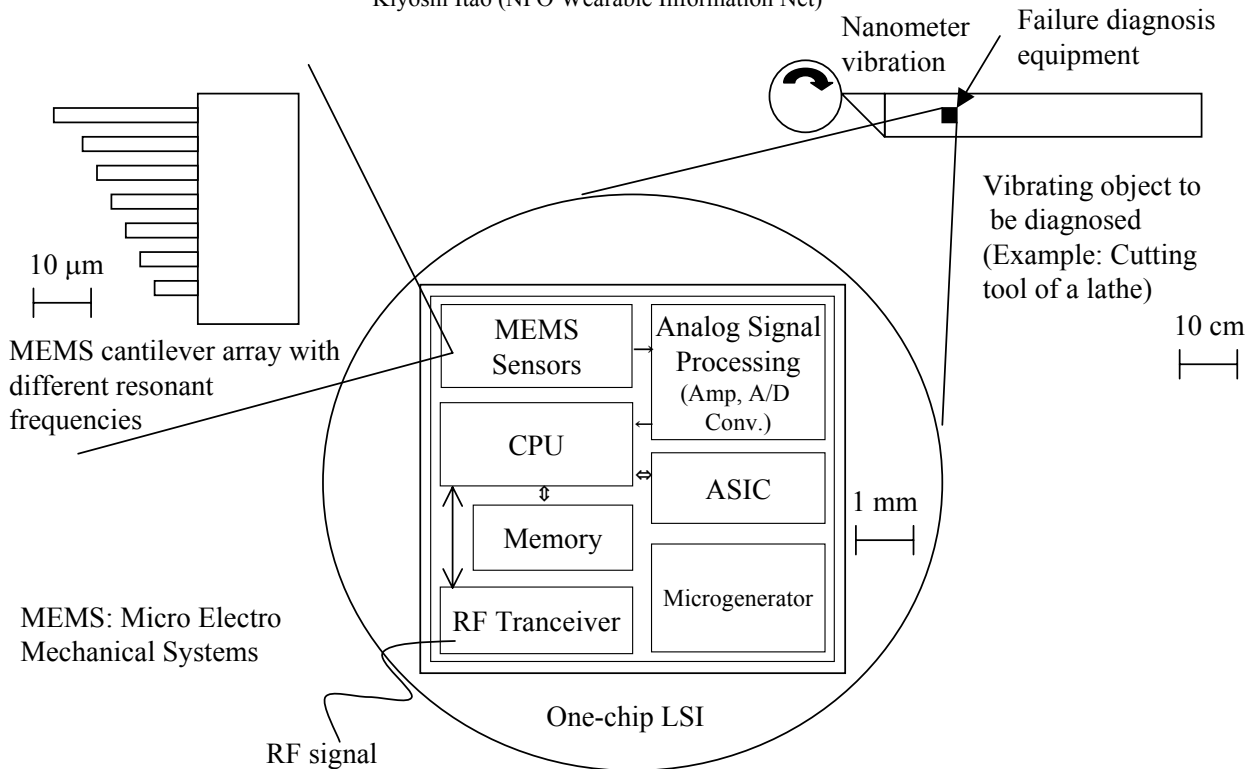


Technical Subject:

Ultra-small failure diagnosis module using a system LSI chip integrated with MEMS vibration sensors

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Goal & Contribution to well-being for all humanity

The goal is to achieve failure diagnosis equipment in which all the basic functions, including vibration sensing, analog signal processing, digital signal processing, memory, communications, and micropower generation are integrated on one silicon chip. This equipment and the network system using it will enable real time monitoring of objects (machines, etc.) being used in a factory, for example, so that serious failures can be prevented.

Method / Approach

This failure diagnosis equipment detects vibration change in an object. When any vibration change that shows precursor of failure is detected, it sends alarm signals to a remote receiver which is connected to communication networks.

We intend to design the system by using separate components, namely MEMS sensors, analog ICs, digital IC and so forth first. One-chip integration of MEMS sensors and analog circuits will be studied subsequently.

Step by step, the equipment will be integrated on smaller number of substrates until one-chip integration will be achieved.

Introduction / Position in the session

This failure diagnosis equipment is the first practical realization of “nature interfacers” that one of the researchers (Itao) has proposed. The concept of the sensor-based network using nature interfacers leads to the next generation communications networks.

Call for collaborations

Discussions on possible collaborations are welcome.