

MEMS manufacturing equipments



ICP RIE for PZT
SAMCO, RIE-101HU

XeF2 gas etcher
SAMCO, VPE-4HU

Si DeepRIE
Sumitomo Precision,
MUC-21 ASE-Pegasus

Profiler
KLA-Tencor P-6

PZT, Pt/Ti sputter
ULVAC, CS-200



Furnaces

Multi-target sputter
Eiko-engineering
ES-250B

Wafer bonder
Ayumi Industry
VE-08-21

Confocal microscope
Lasertec, H1200

E-Beam exposure
Elionix, ELS-3700M

other evaluation equipments



Atomic Force Microscope
Veeco, Nanoscope

High resolution FE-SEM
Hitachi, S-5000H

SEM with EDS
JEOL, JSM6510LA

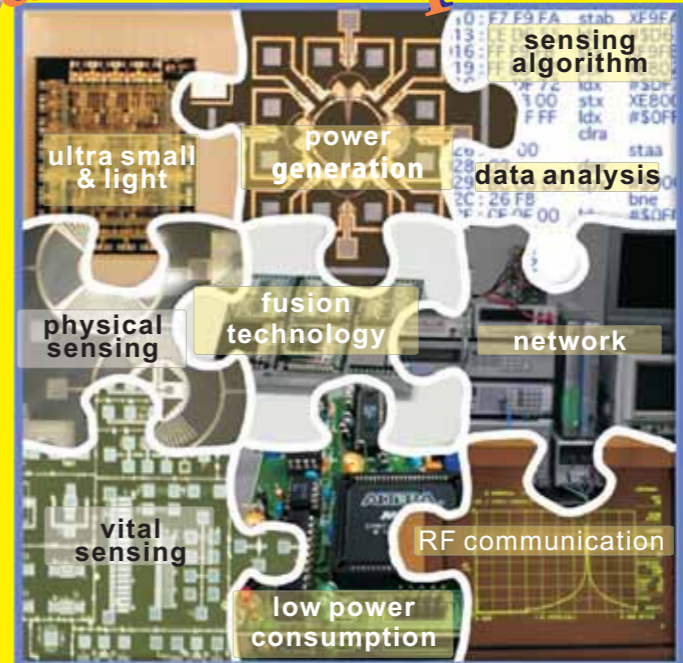
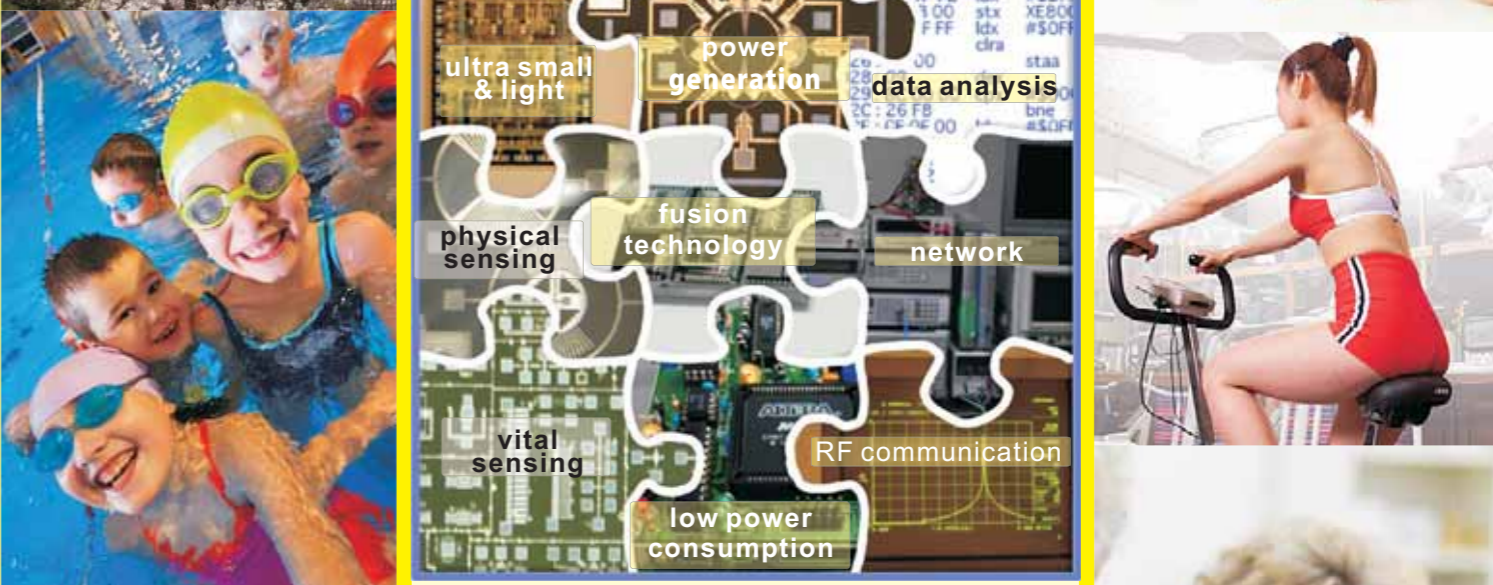
Laser Doppler vibrometer
Neoarc, MLD-103A

Open Labs., Bldg. 8111, University of Hyogo,
2167 Shosha, Himeji, Hyogo Prefecture, 671-2280, JAPAN
TEL:+81-79-267-6019, FAX:+81-79-229-9021, URL: <http://www.eratokm.jp/en>
Contact: Kohei Higuchi, Kenji Nakasuji e-mail: info@eratokm.jp



For a safe and healthy life

Maenaka Human-Sensing Fusion Project

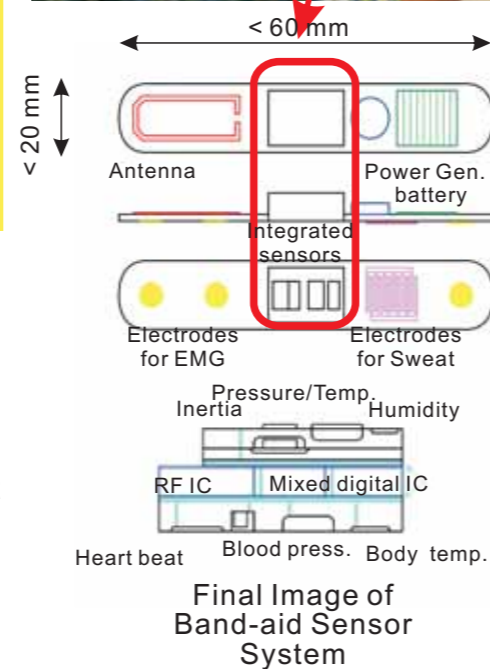
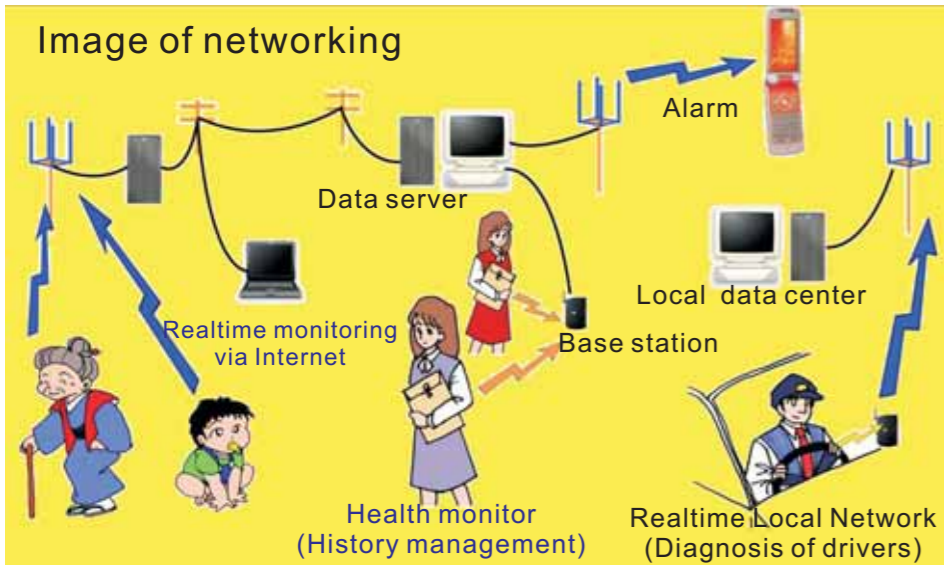


Technology fusion of sensors, circuits and software for a safe and healthy life



ADHESIVE HUMAN MONITORING SENSOR

Outline and Research Target: Maenaka Human-Sensing Fusion Project started as one of ERATO (Exploratory Research for Advanced Technology) projects which JST (Japan Science and Technology Agency) financially supports at April 1st of 2008. This project has been led by Kazusuke



Maenaka, a Professor of Department of Electrical Engineering and Computer Sciences, University of Hyogo.

The declining birthrate, the graying of society, the increasing incidence of so-called "lifestyle diseases": the rise of these and other problems related to changes in the social environment have led to increased interest in issues of safety, welfare and health care. To avoid dying alone, dying from overwork, fatal injury caused by carelessness, or disease attributable to neglecting our health, it would be desirable to monitor our physical condition, our activities and our surroundings in a number of ways, continuously and at all times without the assistance of others and to do necessary medical treatment in case of emergency. In this research field, we aim to develop a human body monitoring system through the integration of wireless communication devices, power generation devices, and sensor devices.

Research Plan and Research System: We've assembled four groups that have committed to developing an integrated system of ultra-small sensors that consumes little energy, contains its own ultra-small power supply mechanism, and utilizes low power wireless networking.

(1) Device Research Group

This group is tasked with developing ultra-small integrated sensors that consume little energy and that detect various physical, vital and environmental quantities such as acceleration, pulse, temperature, moisture and so on using functional materials. This team is also investigating what layout and mounting assembly of sensor elements is best suited to gathering the required data.

(2) Circuit Research Group

Researchers in this group are developing integrated circuits including analog circuits for sensor outputs, AD

converters, digital signal processors, memory devices and an RF interface (315MHz or 2.4GHz band) using CMOS technology focusing on low power consumption circuits with a programmable standby mode. They are also developing packaging and via hole interconnection technology by thinning and stacking circuit chips.

(3) Micro Power Research Group

This group is assigned to investigate power generation and storage mechanisms and to embed a small power supply into the above human monitoring sensor system. They are studying technology for converting human motion into electrical power using piezoelectric or magnetic thin film as well as micro fuel cells.

(4) Software Research Group

The investigators in this group are evaluating what kind of sensors with what characteristics should be used in a target sensing system through initial clinical testing using a prototype sensing system that we call "large model". In this way they are forming an overall picture of the human-monitoring system to be developed. Moreover they take responsibility for developing a low energy consumption RF communication protocol between a device attached to the human body and a base station, along with highly confidential networking technology and an algorithm capable of understanding a person's physical situation through sensor outputs.

Schedule :

FY.07	FY.2008	FY.2009	FY.2010	FY.2011	FY.2012
Examination of System concept and method Development of elemental device technology			Systemizing and packaging	Field test with a body-worn sensing system	Wrap-up

Members:

Project leader	Kazusuke Maenaka		
Device group	Hao Xiuchun	Researcher	2008.04~
	Kensuke Kanda	"	2008.05~
	Jiang Yonggang	"	2009.04~
	Hiroyuki Hamada	"	2009.10~
	Kazuo Kasai	"	2008.04~
	Tadashi Usami	"	2009.01~
	Taichi Hashimoto	Assistant	2008.11~
	Tomoki Iga	"	2008.12~
	Yoshiharu Nagatani	"	2009.04~
Micro Power group	Takayuki Fujita	Group leader	2008.04~
	Wu Lan Qi Qi Ge	Researcher	2009.02~
Circuit group	Mitsutoshi Saito	Researcher	2008.04~
	Zhu Dasong	"	2009.06~
	Kouji Sonoda	Assistant	2009.04~
Software group	Kei Kuramoto	Group leader	2009.08~
	Ryota Kurozumi	Researcher	2008.04~
	Masaya Mito	"	2008.04~ 2009.03
	Jun Okada	Assistant	2009.11~
Staff	Kohei Higuchi	Research Manager	2008.04~
	Kenji Nakasuji	Administrative Manager	"
	Miki Muraoka	Administrative Assistant	"