

| | | | |
|---|--|------------------|-----------------|
| Division of Electrical Engineering and Computer Science | Research field | Microelectronics | Lab. ID EC07 |
| Laboratory web site | http://www.merl.jp/ | | |
| Research subjects | | | |
| <p>MeRL (Microelectronics Research Lab.) focuses on the system architecture, large scale integration (LSI) circuitry, and the applications of LSI systems. Significant research challenges in our research projects are driven by the future applications of microelectronics, for example, energy-harvesting wireless sensor network, health monitoring sensors, high-precision analog-to-digital converters, and extreme low-power non-volatile memories. The application systems are developed to demonstrate the practicality of the proposed technology. The LSI system designed by the students can be fabricated by the semiconductor manufactures.</p> | | | |
| Master/Doctor course: Education policy, curriculum, typical activity in the laboratory | | | |
| <p>The students in the research group can propose his own research project through the literature research, patent search, and discussion about the novelty, feasibility, usefulness, and cost-efficiency, and so on. The research project may be revised and revisited. All students are required to participate the weekly presentation of the research and the weekly lecture of the literature in turn. The joint-meeting with other laboratories will be held a few times a year to view and discuss the results of the research from a different view point. If you obtain the basic data on your research, you can apply the patent with help of the supervisor and the staff of Kanazawa university technology license organization. There are many students who have his patents and is involved in a collaboration with other laboratory or industry.</p> | | | |
| Daily life in the laboratory, etc. | | | |
| <p>Personal working desk with a personal computer and a notebook is available for every student. The prototyping room of circuit boards and software, and measurement room open for the student anytime a 24 hours a day. Thus, any idea you hit upon should be tried to implement the electronic system by using the facilities. If you cannot implement it with the conventional technologies, you may find the challenge to be addressed in your research project. Our research group administrate the Hokuriku branch of Very Large Scale Integration Design and Education Center (VDEC), which is the inter-university organization for LSI research in Japan. The computer-aided design (CAD) software is licensed by VDEC and you can develop an original LSI with CAD tools and the advanced facilities in VDEC.</p> | | | |
| Message or comments by the laboratory faculty staffs | | | |
| <p>We put more emphasis on the proposal and experimental production of application system of the invented LSI or circuit technology. The students should work together and share the technical information with each other. The interaction between the students, the laboratories, the universities, and the institutions will help you to be full of idea in the research field. You will have the chance to be acquainted with the students and researchers of other universities or other countries through the VDEC community. Many international students are enrolled in this research group.</p> | | | |
| Recent Master theses in these 3 years (+ more if appropriate) | | | |
| year.month | Thesis title (including English translation of Japanese thesis title) | | |
| 2017.3 | A Stochastic Two-Step Analog-to-Digital Converter | | |
| 2017.3 | Design and Implementation of the Algorithm of AES Encryption with High-throughput and Low-power Consumption Based on FPGA | | |
| 2017.3 | Study of Power Supply Circuit of Sensor Network Terminal Using Environment Power | | |
| 2015.3 | Design and evaluation of the capacitance measurement circuits for the tactile sensors | | |
| 2015.3 | Health-monitoring system with electrical resistance measurement of the acupuncture points | | |
| 2015.3 | Radical sensor application of parametric electron spin resonance | | |
| 2014.3 | Smart phone application using insect sounds for environmental monitoring | | |
| 2013.3 | Sensitivity analysis and sensitive technique on radical sensor | | |
| 2013.3 | Development of photonic pixels and application to the spectral image sensor | | |
| Recent Doctoral theses in these 3 years (+ more if appropriate) | | | |
| year.month | Thesis title (including English translation of Japanese thesis title) | | |
| 2016.3 | Use of MOS Gas Sensors with Temperature Modulation-Specified Detection Point for Potential Identification of Soil Status Using Electronic-Nose Principle | | |
| 2012.3 | Design of extreme low-power and passive wireless sensors | | |
| 2012.3 | Method of interconversion between audio signal and closed curve | | |
| 2007.3 | Design methodology of phase change nonvolatile random access memories embedded on CMOS LSI | | |
| Laboratory mail address | Akio Kitagawa <kitagawa *at* merl.jp> | | |