

FUKUOKA

Fukuoka Establishing Project of a Cluster for System-LSI Design and Development

Outline of the Project

Five research programs on architectures and design methodologies for system LSI (or System-on-a-Chip(SoC)) are carried out with the collaboration among universities, semiconductor industries and venture companies in Fukuoka area. FLEETS, Fukuoka Laboratory for Emerging & Enabling Technology of SoC, opened as a central institute of the research activities. The goal of the project is to establish a leading research and develop the center of advanced technologies on SoC design in Silicon-Sea Belt, where more than 40% of LSIs in the world are fabricated.

Members of the Headquarters

- President..... ASO Wataru (Fukuoka Prefectural governor)
- Project Director..... HIRAKAWA Kazuyuki
- Research Director..... YASUURA Hiroto (Prof., Kyushu Univ.)
- Science and Technology Coordinator..... TSURU Masato

Central Project Organization Fukuoka Industry, Science & Technology Foundation

Core Institute(s) Graduate School of Information Science and Electrical Engineering, Kyushu Univ.,
System LSI Research Center, Kyushu Univ.,
Advanced Science and Technology Center for Cooperative Research, Kyushu Univ.,
Faculty of Engineering, Fukuoka Univ.

Participants Industry...SIIEDA Technologies Inc. Kyushu Mitsumi Co.,Ltd. Saga Electronics Co.,Ltd.
Ueno Seiki Co.,Ltd. SONY Semiconductor Kyushu Co.,
Software Research Associates Nishi-Nihon, Inc.
Institute...Kyushu Univ., Fukuoka Univ.

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System LSI

Outline of Researches

●Design Method for Low Energy and Mobile System LSIs

This program addresses to establish a new comprehensive design method for low energy system LSIs applicable to the next-generation mobile intelligent terminals, home information devices, and IC cards, which are available in the circumstance of ultra low-energy supply such as wireless power supply. The goal of the program is to develop a fundamental technology for the next-generation social systems.

[Kyushu Univ., etc.]

●Next-Generation SoC Architectures

Future SoC's will need some ability to optimize and customize their hardware and software according to the dynamic behavior of application programs, the surrounding environment, and/or users' customs. This research project will develop a set of fundamental technologies for such "SysteMorph", or dynamically adaptive system-level optimization, including online profiling, dynamic binary rewriting, reconfigurable fabric, and so on.

[Kyushu Univ., etc.]

●Design Methodology for SiP (System in a Package) Module

A System in a Package (SiP), or a single part into which more than one LSI chip, such as processors and memories, is combined, can be provided in smaller lots and with a shorter lead-time compared with a System on a Chip (SoC) (onto which all the elements are integrated). Design tools combined with characterization and prototyping technologies will be developed for optimum SiP fabrication.

[Fukuoka Univ. SIEDA Technologies Inc. Kyushu Mitsumi Co.,Ltd. Saga Electronics Co.,Ltd.]
[Ueno Seiki Co.,Ltd. SONY Semiconductor Kyushu Co.]

●EDA Technology for The Next Generation

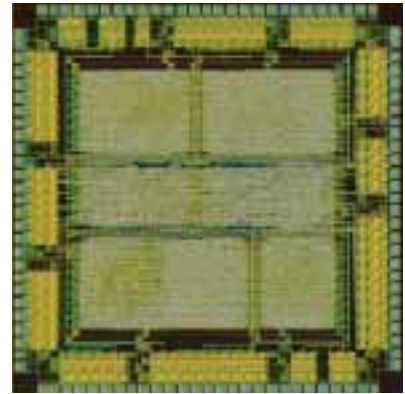
Developing a unified framework for System LSI design environment, featuring behavioral synthesis, RTL synthesis, logic synthesis, and layout synthesis. The project is targeting to re-establish the fundamental EDA(Electronic Design Automation) technology for the next generation System LSI. Along with the EDA framework, a novel design methodology for System LSI that enables quick, error-free, and high-quality design will be developed.

[Kyushu Univ., etc.]

●Design Methodology for Embedded Software

Embedded software must change its functions and behaviors to meet each consumer's requirement. However, today's mass production of embedded software will be difficult in near future. This program is targeting to develop a fundamental embedded software design methodology and technologies that allow embedded software to be easily developed and to meet consumer's requirements.

[Kyushu Univ. Software Research Associates Nishi-Nihon,Inc., etc.]



A system LSI chip contains processors, memories, communication interface circuits, and analog circuits, which are integrated on a small silicon chip. It is used in various electronic devices.

FLEETS



For the concentrated investments of human resources, FLEETS is established as the central research institute of the project. It is located in the Advanced Science and Technology Center for Cooperative Research of Kyushu University.

Expected Results

●Design technologies for System LSI will be developed, which will support information technologies for a sophisticated society.

- Realization of very small-sized information terminal with very small electric power supply
- Realization of the Information Technology devices, which optimize their behavior and structure according to the usage and requirements of customers
- Realization of cost effective Information Technology devices, which are with high performance, low-power consumption, high quality, and high reliability