Fukuoka Project of a Cluster for System LSI Design and Development

Life Sciences IT Environment Nanotech/Materials

KNOWLEDGE CLUSTER INITIATIVE

Creating new industries in the area of system LSI design and development

Overview

This cluster will exploit the local concentration of knowledge (at institutions like Kyushu Un versity) and industry (in the design and development departments of large semiconductor companies, and LSI design ventures). Joint research w ll be conducted in five areas relating to key technologies for system LSI: "System LSI application technology", "System LSI architecture technology" and "System LSI design support technology". These research will be conducted around the nucleus of the central research organization FLEETS (Fukuoka Laboratory for Emerging & Enabling Technology of SoC), thereby forming a system LSI design and development cluster in the Silicon Sea-Belt of Asia, where 40% of the world's semiconductors are produced.

Cluster Headquarters

- ○ President ····· Wataru Aso (Governor, Fukuoka Prefecture)
- ○ Project Director ····· Kazuyuki Hirakawa
- ○ Chief Scientist (CS) ····· Hiroto Yasuura (Professor and Director, System LSI Research Center, Kyushu University)
- ○ Science and Technology Coordinators Masato Tsuru, Koichi Hatano, Daniel Li

Core Organization Fukuoka Industry, Science & Technology Foundation (Fukuoka IST)

Participating Research Organizations (Bold: Core Research Organizations)

Industry···SANYO Electric Co., Ltd., Logic Research Co., Ltd., NEC Micro Systems, Ltd., FUJITSU LABORATORIES Ltd., FUJITSU NETWORK TECHNOLOGIES LIMITED, TOKYO ELECTRON LTD., Jedat Innovation Inc., Ueno Seiki Co., Ltd., Kyushu Mitsumi Co., Ltd., Saga Electronics Co., Ltd., SONY Semiconductor Kyushu Co., System JD Co., Ltd., Software Research Associates Nishi-Nihon, Inc., SHARP CORPORATION, Network Application Engineering Laboratories Ltd.

Academia···**Graduate School of Information Science and Electrical Engineering (Kyushu University), System LSI Research Center (Kyushu University), Advanced Science and Technology Center for Cooperative Research (Kyushu University), Fukuoka University Faculty of Engineering**

Government···Institute of Systems & Information Technologies/KYUSHU; Fukuoka Industrial Technology Center; Fukuoka Industry, Science & Technology Foundation (Fukuoka IST)

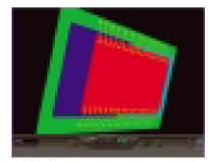
Project Director
Kazuyuki Hirakawa

Knowledge Cluster Initiative in the Fukuoka Project for System LSI Design and Development

In the two years since 2002, our headquarters activities have involved: formulation of research policy and intellectual property strategy, consolidating things like the research support system, and startup of the central research laboratory for Knowledge Cluster Initiative. Joint research involving academia, industry and government has been conducted on 5 topics relating to app ication technology, architecture technology and design support technology for system LSI. This work also involved publication of academic papers and filing for basic software patents, and progress has been made in clarifying the goals of each research project. We are also linking up with the Kitakyushu Human Technology Cluster which s conducting research in the area of system LSI next-generation applications.

In 2004 we will mark the halfway point through the project, and our aim is to progress from the stage of foundation-building to the stage of research with clearly established target applications. To achieve this goal, we shall: (1) Set R&D goals which are cognizant of the market for the final product, and strengthen technology marketing capab lities, (2) Develop product prototypes and test them in actual fields etc., (3) Clarify intellectual property strategies w th a clear path toward commercial zation, acquire basic patents, and at the same time formulate plans and conduct test runs in areas l ke organizing to make the central laboratory independent, and obta ning operating funds etc.

Evaluation board for dynamic optimization LSI technology



SiP design support tool

Kazuyuki Hirakawa *is a former general manager of the electronics devices group at Oki Electric Industry Co., Ltd.*

Outline of the Joint Research by Industry, Academia and Government

System LSI is a crucial foundation of the sophisticated information society which continues to rapidly evolve. In this area, our aim is to conduct R&D on system LSI application technologies, system LSI architecture technologies and design support technologies, and to create the technology "seeds" to act as the foundation for next-generation system LSI design and development.

●System LSI application technologies

We are developing general design techno ogies for realizing new types of system LSI which can work with extremely low energy consumption. These system LSI will be designed for use in applications where demand is rapidly growing, like mobile information terminals, wireless LANs, IC cards and tag chips, and information appliances. In this way, we shall provide basic technologies which contribute to the building of social infrastructure systems.

Research topic: Development of system LSI for mobile applications with ultra-low power consumption

●System LSI architecture technology

In "dynamic system optimization technology", the system LSI itself, which is designed assuming use in a wide range of products, observes how it is being used after product shipment, so it can use that information to evolve the hardware and software into an optimal state. This is one type of technology we aim to establish. We also aim to establish design technology for SiP (System in Package), in which multiple LSI chips (like processors and memory) are integrated into a single component to cope with low-quantity/high-diversity production. Using these architecture technologies, we shall develop essential, important technologies which are not affected by trends, and provide those in the application field w th feedback on our results.

Research topics: Development of next-generation system LSI architectures,
Establishment of SiP module design technology

●System LSI support technology

As IT equipment becomes increasingly functional, system LSI is becoming more complex and larger in scale, and this makes design difficult. For this reason, we shall develop design support technology, and the software and other tools necessary for realizing that technology. Since many functions are now being implemented using embedded software, which is stored in memory, this embedded software is growing in scale and complexity, so there is a need for new types of software engineering for system LSI. For these reasons, we shall create development technology for embedded software in new system LSI.

Research topics: Development of next-generation system LSI design support technology,
Development of development technology for embedded software