

IEEE Computer Society COMPSAC2020

Panel, July 14 : “To Patent or Not to Patent?”



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Senior Executive Vice President, Waseda University
IEEE Computer Society President 2018

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1980 BS, 82 MS, 85 Ph.D. , Dept. EE, Waseda Univ.

1985 Visiting Scholar: U. of California, Berkeley, 1986 Assistant Prof, 1988 Associate Prof, Waseda
1989-90 Research Scholar: U. of Illinois, Urbana-Champaign, Center for Supercomputing R&D,
1997 Prof., 2004 Director, Advanced Multicore Research Institute, Waseda
2017member: the Engineering Academy of Japan (2020 Board) , Science Council of Japan
2018 IEEE Computer Society President, Senior Vice President for Reseach & IT, Waseda Univ.

<Committees in Societies and Government: 263>

IEEE Computer Society: President 2018, Executive Committee(2017-2019), BoG(2009-14),
Strategic Planning Committee Chair 2018, Multicore STC Chair (2012-), Japan Chair(2005-07),
IPSJ Chair: HG for Magazine. & J. Edit, Sig. on ARC.

【METI/NEDO】 Project Leaders: Multicore for Consumer Electronics, Advanced Parallelizing
Compiler, and Green Computing, Chair: Computer Strategy Committee

【Cabinet Office】 CSTP Supercomputer Strategic ICT PT, Japan Prize Selection Committees, etc.

【MEXT】 Info. Sci. & Tech. Committee, Supercomputers (Earth Simulator, HPCI Promo., Next Gen.
Supercomputer K) Committees, JST Moonshot Project G3 Robot & AI Vice Chair,

【COCN】 Board Member in Council of Competitiveness Nippon, etc.

<Research Accomplishment>

Reviewed Papers: 221, Invited Talks: 190,
Granted Patents: 54 (Japan, US, GB, China),
Articles in News Papers, Web News, TV etc.: 625

<AWARD>

1987 IFAC World Congress Young Author Prize

1997 IPSJ Sakai Special Research Award,

2005 STARC Academia-Industry Research Award,

2008 LSI of the Year Second Prize,

2008 Intel Asia Academic Forum Best Research Award,

2010 IEEE CS Golden Core Member Award

2014 Minister of Edu., Sci. & Tech. Research Prize

2015 IPSJ Fellow, 2017 IEEE Fellow, Eta Kappa Nu

2019 Sprit of IEEEComputer Society Award,

2020 IPSJ Contribution Award

Patents related with OSCAR Parallelizing Compiler & Hardware

Currently 54 international patents in USA, UK, China, Japan to improve effective performance, cost-performance and software productivity and reduce power

Multigrain Parallelization for Embedded Multicores and Heterogeneous Multicores

& Hardware Supports (Synchronization) coarse-grain parallelism among loops, subroutines & basic blocks among statements in addition to loop parallelism

Data Localization: Global Cache & Local Memory Optimization

Automatic data management for distributed shared memory, cache and local memory

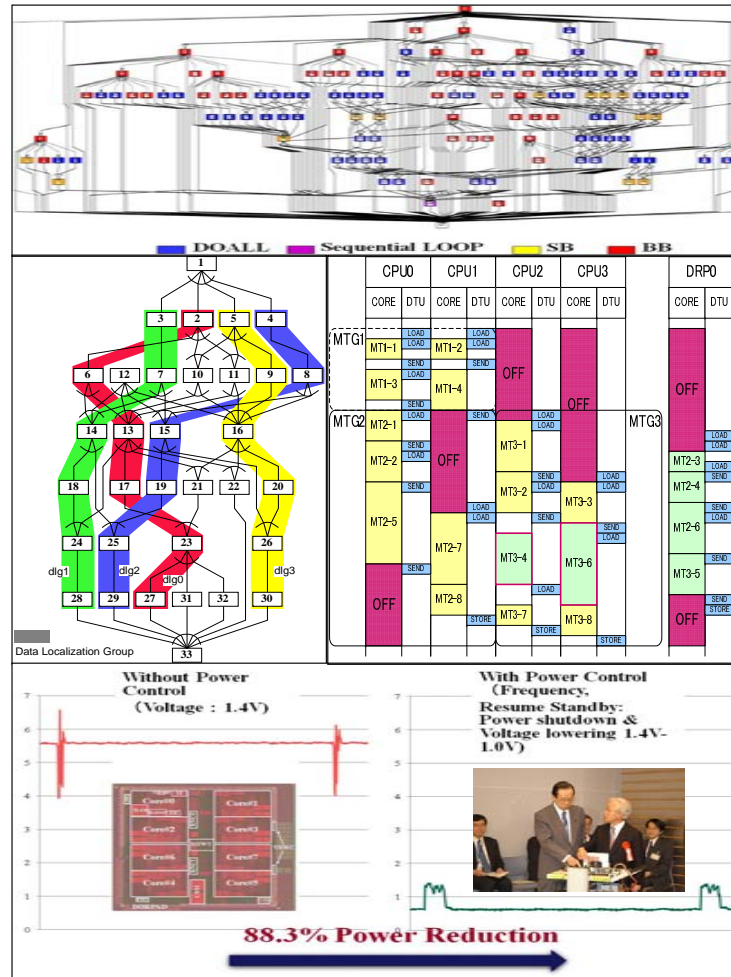
Software Cache Coherent Control Data Transfer Controller

Data transfer overlapping using Data Transfer Controllers (DMAs) hardware & its compiler

Power Reduction Compiler and Hardware

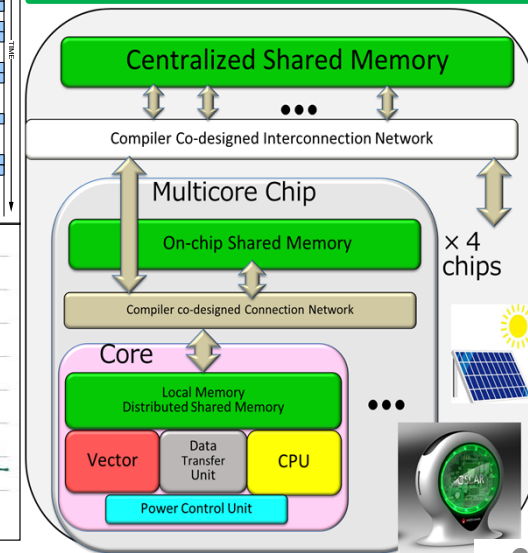
Reduction of consumed power by compiler control DVFS and Power gating with hardware supports.

Accelerator See right figure



Accelerator

can be attached to any processor cores, RISC-V, arm, Infineon Renesas, etc, without instruction extensions. It works with local memory management, DMA & power reduction with full compiler vectorization & parallelization



OSCAR Technology Corp.

Started up on Feb. 28, 2013: New CEO from April 1, 2020

Though the all patents and OSCAR compiler from Waseda Univ. have been licensed until March 31,

“all Hardware” and “Software Patents outside USA and Japan” can be licensed to any companies since April 1, 2020

New CEO from April 1, 2020: Mr. Satoshi Miki (CEO. Fixstars)

Previous Executives

Dr. M. Ohashi : COO (Ex- OO of Ono Sokki)

Mr. A. Nodomi : CTO (Ex- Spansion)

Dr. K. Shirai (Ex- President of Waseda U., Ex- Chairman of Japanese Open U.)

Mr. S. Tsuchida (Co-Chief Investment Officer of Innovation Network Corp. of Japan)

Auditor: **Mr. S. Honda** (Ex- Senior VP and General Manager of MUFG)

Dr. S. Matuda (Emeritus Prof. of Waseda U., Chairman of WERU INVESTMENT)

Mr. Y. Hirowatari (President of AGS Consulting)

Advisors: **Prof. H. Kasahara** (Waseda U.)

Prof. K. Kimura (Waseda U.)

Dr. T. Ono (Ex- CEO of OSCARTECH & First Section-listed Company, Director of National U., Invited Prof. of Waseda U.)

Mr. K. Ashida (Ex- VP Sumitomo Trading, Adhida Consult. CEO)



Waseda University Open Innovation Ecosystem

Waseda University

Research revitalization

- Participation of graduate students for Collaboration :
 - Increase PhD students with monetary supports
 - Increase top journal and conference papers solving difficult problems from social needs
 - Motivate Professors and Researchers with incentives: reward, reduced lecture hours, space

Promote industry-academia cooperation

- Support collaboration with industry
 - Build teams for satisfying needs from Industry
- **One-stop support desk**
 - Introduce university seed technologies (PR)
 - Matching of succeeded and new Ventures
 - Meeting of Industry, Ventures, Researchers & students
- **Wol Forum on March 10 every year**
 - Contract support with Industry: IP & Budget Estimation
 - Student Agreement support (IPs and NDAs)

- Patent Support
 - Help acquire intellectual property through-out patent filing and examining to minimize researcher's loads
 - Help utilize intellectual property: Licensing
- Research ethics course support

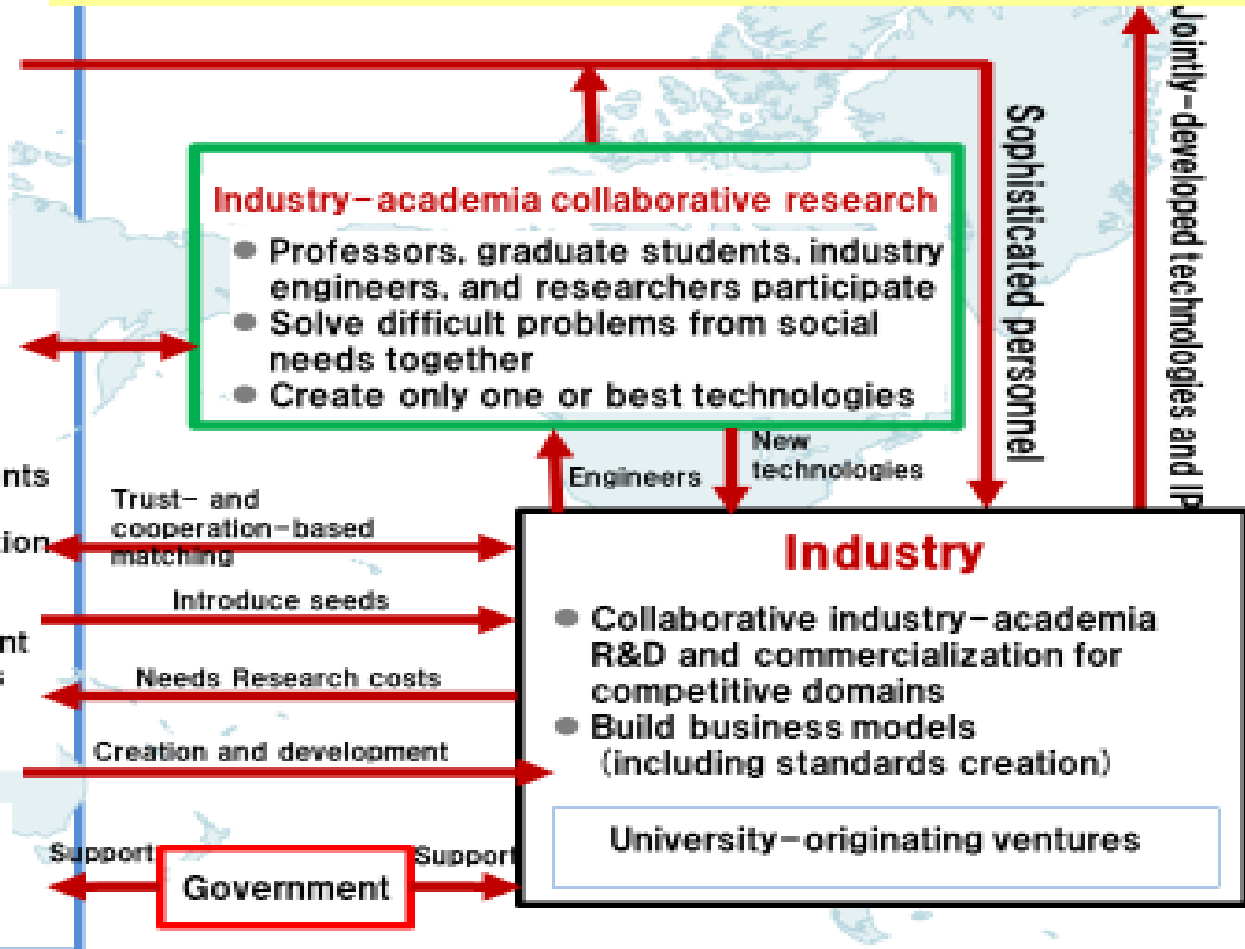
Venture startup and acceleration

- Introduce venture funds and teams including management, accounting, legal specialist
- University IP licensing by Cash, Stock, etc.
- Value-Up support: Customer matching etc.

High added-value products and services

Industry-academia collaborative research

- Professors, graduate students, industry engineers, and researchers participate
- Solve difficult problems from social needs together
- Create only one or best technologies



Waseda Open Innovation Valley Project



Waseda Main Campus

- **Research Innovation Center to be completed in March 2020**
- **Industry Academia Collaboration One Stop Desk, Research Support and Strategy, TLO, Contract Support, Venture Start-up Support**

March 10, 2021 in Waseda Arena
Waseda Open Innovation Forum (WoI) 2021
(Matching among Leading Professors & Researchers, Industry, Ventures, Students)

New Research Innovation Center (Open: April 2020)

Supported by MEXT Open Innovation Project

Toyama Campus

Supported by METI

Waseda Arena with roof garden: Collaboration in Sport Science

Green Computing Center for Industry Collaboration

Number of International Students

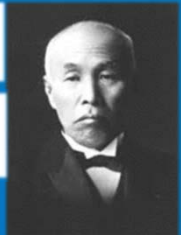
7,942* from **125** countries and territories
(Undergraduate and Graduate)

Alumni CEOs in Japan

10,606

8 Prime Ministers

Founder Shigenobu OKUMA



Graduate Employability

#1 in private university of Japan
(#2 in Japan, #27 in the world)
 QS Graduate Employability Rankings 2019

ALUMNI
[卒業生]
630,000

PARTNER INSTITUTIONS
[協定大学・機関]
848 (93 countries)

FACULTY <small>[教員]</small> 5,468	ENROLLMENT <small>[学生数]</small> 49,436	UNDERGRADUATE STUDENTS <small>[学部生]</small> 41,051	GRADUATE STUDENTS <small>[大学院生]</small> 8,385
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NUMBER OF BOOKS
[図書館蔵書]
5,800,000



- Prime Ministers**
- 8th Shigenobu Okuma
 - 17th Shigenobu Okuma
 - 55th Tanzan Ishibashi
 - 74th Noboru Takeshita
 - 76th Toshiki Kaifu
 - 84th Keizo Obuchi
 - 85th Yoshio Mori
 - 91st Yasuo Fukuda
 - 95th Yoshihiko Noda

- Business Leaders**
Founders of global companies
- Sony
 - Samsung
 - Casio
 - LOTTE

- Business Leaders**
CEOs of global companies
- ANA (All Nippon Airways)
 - HONDA
 - Nintendo
 - UNIQLO
 - Shiseido
 - Nomura Securities Co., Ltd.
 - Tokio Marine & Nichido Fire Insurance Co., Ltd.
 - Olympic Corporation

Aiji TANAKA

President
 International Political Science Association (IPSA)
 President 2016

Hironori KASAHARA

Senior Executive Vice President
 IEEE Computer Society President 2018. The first president from outside USA and Canada in 72 years CS history. CS has 84,000 members from 168 countries.

Toshio FUKUDA

The University Professor Waseda, Waseda Alumnus, Prof. Emeritus Nagoya Univ., Prof. Meijo Univ. IEEE President 2020. The first from Asia in 135 years history. IEEE has 420,000 members.

Haruki MURAKAMI

Hirokazu KOREEDA

Yuzuru HANYU

S. ARAKAWA

Daiya SETO