

# Open Innovation at Waseda University



**Prof. Hironori Kasahara, IEEE Life-Fellow, IPSJ Fellow**  
**Past Senior Executive Vice President, Waseda University**  
**IEEE Computer Society President 2018**  
**Board Member: The Academy of Engineering of Japan & COCN**



URL: <http://www.kasahara.cs.waseda.ac.jp/>

**1980 BS, 82 MS, 85 Ph.D.** , Dept. EE, **Waseda Univ.**  
**1985 Visiting Scholar: U. of California, Berkeley,**  
**1986 Assistant Prof., 1988 Associate Prof., 1989-90**  
**Research Scholar: U. of Illinois, Urbana-Champaign,**  
**Center for Supercomputing R&D, 1997 Prof.,**  
**2004 Director, Advanced Multicore Research Institute,**  
**2017member: the Engineering Academy of Japan (2020-**  
**Board Mem) and the Science Council of Japan**  
**2018 IEEE Computer Society President**  
**Senior Vice President, Waseda Univ.** (2018 Nov.-2022 Sept.)

**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 Spirit of IEEE Computer Society Award,**  
**2020 IPSJ Contribution Award,**

**Reviewed Papers: 232, Invited Talks: 230,**  
**Granted Patents: 67** (Japan, US, GB, DE, China),  
**Articles in News Papers, Web News, TV etc.: 697**

**Committees in Societies and Government 287**  
**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, 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.**



USA Ambassador:  
Caroline Kennedy

USA President:  
Bill Clinton



WASEDA University  
Chinese President:  
Hu Jintao

# 早稻田大学



Archaeological excavation of the Matsudo site  
In 1986, an archaeological excavation near Matsudo, Chiba Prefecture, revealed a site that was identified as the site of the ancient Yayoi site. In 1991, the site was named the Matsudo Site by the National Institute of Cultural Heritage in Tokyo. The site was the "Yayoi site" which was the site of the Yayoi culture, and was the site of the Yayoi culture.

# WASEDA University

## Tokyo - Attractive Location



Chiyodakita Tokyo, Japan

WASEDA

- 1 MICHELIN-STARRED RESTAURANTS (JAPANESE)
- 3 BEST STUDENT CITIES RANKING (AS BEST STUDENT CITY 2014)
- 1 GLOBAL CITY RANKING (AT RANKING 2014)
- 1 HOSPITALITY CITY (INTERNATIONAL 2014)
- 1 PUBLIC TRANSPORTATION, NEARBY LOCALS (SAFETY, CLEANLINESS) (INTERNATIONAL 2014)

## Tokyo, Japan



**1882** >  
Okuma Shigenobu  
founded Tokyo  
Sumitomo Gakko  
(College)



The "Group of Five" who contributed to the development of Waseda University  
In 1902, Okuma Shigenobu, former Prime Minister of Japan, visited the United States and returned with a group of five men who were the founders of Waseda University. They were Okuma Shigenobu, Tokutomi Sohji, Tokutomi Junji, Tokutomi Kiyomasa, and Tokutomi Kiyomasa. They were the founders of Waseda University.



**1903** >  
Gift of the Waseda Site (Inscribed with Japanese)



Microsoft:  
Dr. Bill Gates



British Prime Minister:  
Boris Johnson

# WASEDA UNIVERSITY

**1922** >  
Visit by physicist Albert Einstein to Waseda University  
In November 1922, Albert Einstein visited Waseda University. He was the first foreigner to visit Waseda University. He was accompanied by his wife and two children. He was in Japan for a short time, but he was very popular. He was very popular in Japan. He was very popular in Japan.

**1928** >  
Japan's first postmaster  
The first postmaster in Japan was appointed in 1928. He was appointed to the position of postmaster in Japan. He was appointed to the position of postmaster in Japan. He was appointed to the position of postmaster in Japan.

**1940** >  
"Man to Man"  
First Japanese film  
In 1940, the first Japanese film was made. It was a film about a man and a woman. It was a film about a man and a woman. It was a film about a man and a woman.

**1956** >  
The beginning of the Industrial Cabinet, first cabinet of Waseda University  
In 1956, the first cabinet of Waseda University was formed. It was a cabinet of Waseda University. It was a cabinet of Waseda University. It was a cabinet of Waseda University.

**1962** >  
Robert Kennedy visits Waseda University  
In 1962, Robert Kennedy visited Waseda University. He was the first American to visit Waseda University. He was the first American to visit Waseda University. He was the first American to visit Waseda University.

**1993** >  
Visit to Waseda University by then U.S. President Bill Clinton  
In 1993, Bill Clinton visited Waseda University. He was the first American President to visit Waseda University. He was the first American President to visit Waseda University. He was the first American President to visit Waseda University.

**2007** >  
150th founding anniversary - formed the "Council of Presidents" of the university  
Waseda University has celebrated its 150th founding anniversary. It was a special occasion for Waseda University. It was a special occasion for Waseda University. It was a special occasion for Waseda University.

**2012** >  
Formation of Waseda Vision 2020  
Waseda University has formed a vision for the future. It was a vision for the future. It was a vision for the future. It was a vision for the future.



Alibaba  
Mr. Jack Ma



# Waseda University 早稲田大学

## Alumni CEOs in Japan

10,606

9 Prime Ministers

Founder  
Shigenobu OKUMA



<https://www.kantei.go.jp/jp/reki/dainai/kaku/index.html>



Hiroshi YAMAUCHI Masaru IBUKA Tadashi YANAI



- ### Prime Ministers
- 8th Shigenobu Okuma
  - 17th Shigenobu Okuma
  - 58th Tanzan Ishibashi
  - 74th Noboru Takeshita
  - 76th Toshiki Kaifu
  - 84th Keizo Obuchi
  - 85th Yoshiro Mori
  - 91st Yasuo Fukuda
  - 96th Yoshihiko Noda
  - 100th Fumio Kishida

- ### 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.
  - Tokai Marine & Nichido Fire Insurance Co., Ltd.
  - Olympus Corporation

## Number of International Students

7,942

125 countries and territories  
from  
Undergraduate and Graduate

## 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)

100% Schools  
School Ranking 2018

FACULTY [教員]	ENROLLMENT [学生数]	UNDERGRADUATE STUDENTS [学部生]	GRADUATE STUDENTS [大学院生]
5,468	49,436	41,051	8,385

NUMBER OF BOOKS  
[図書総数]  
5,800,000



**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 Alumni, Prof. Emeritus Nagoya Univ., Prof. Meiji 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**

**Yui Suzuki**





**Bjarne Stroustrup: Morgan Stanley & Columbia Univ.**  
**2018 IEEE Computer Society Computer Pioneer Award**  
IEEE COMPSAC2018 Keynote & Award Ceremony

# 215

International Conferences



July 26, 2018, Keynote,  
Hitotsubashi Hall



July 25, 2018 Award Ceremony  
Rihga Royal Hotel Tokyo



12 Magazines

35 Journals

47 Total Publications



IEEE COMPUTER SOCIETY  
**BY THE NUMBERS**

6 New Standards

230 Active Standards

**IEEE754, 802**

373,100+ Community Members

12,000+ Volunteers

615 Committees/Boards

2,352+ Meetings/Teleconferences

168 Countries with CS Members



847,000+ Articles in CSDL

634 Chapters



# ACM/IEEE SC (SuperComputing) 19, Denver, Nov.17-22, 2019



Cornel Univ. Prof. Steven Squyres: Mars Exploration, CalTech. Dr. Katie Bouman: Visualization of Black Hole

# Waseda Open Innovation Ecosystem

## Waseda University

### Research revitalization

- Participation of graduate students for Collaboration :
  - Increase PhD students with monetary supports: Stipend
  - Increase top journal & conference papers & patents 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 researchers' 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.
- Acceleration/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

Engineers  
New technologies

Sophisticated personnel

Jointly-developed technologies and IP

Trust- and cooperation-based matching

Introduce seeds

Needs Research costs

Creation and development

Support

Support

Government

## Industry/Companies

- Collaborative industry-academia R&D and commercialization for competitive domains
- Build business models (including standards creation)

University-originating ventures  
(Donation → Univ. Endowment)



# Waseda Research Innovation Center Supporting for Ventures, IP, Collaboration

Ex-Director  
Hironori Kasahara  
SEVP  
Waseda Univ



Research Innovation Center (June 2020~)  
Hub of Waseda Open Innovation Ecosystem

Research Strategy Center

**Strategy for  
Open Innovation**

Waseda TLO

**IP Creation,  
Licensing, Contract**

Waseda Center for Entrepreneurship

**Venture  
Startup,  
Acceleration**



Open Innovation Research Project  
with Industry Supported by MEXT

Energy

Environment

Recycle

ICT

City Design

Life

Automotive

etc.

**Industry  
Collaboration**

**Gallery for Ventures:** with TULLY'S Coffee Shop

# Waseda Open Innovation Valley Project

To provide an Innovation Environment where students, professors, and staff can make challenges.



- 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

早稲田大学  
**Waseda Main Campus**

**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)**



**Toyama Campus**

**Waseda Arena with roof garden: Collaboration in Sport Science**



Supported by METI

**Green Computing Center for Industry Collaboration**



Supported by MEXT  
**Open Innovation Project**



Mar. 9-10, 2021, Online(2300 Participats)

**WOI: Waseda Open Innovation Forum**  
**Executive Committee Chair**  
**Prof. Hironori Kasahara, SEVP, Waseda Univ.**

**笠原博徳**

**Univ. of Oxford,**  
**VC Prof. Loise**  
**Richardson**

What the University of Oxford  
has learned during the pandemic

Vice-Chancellor of the University of Oxford

Prof. Loise Richardson

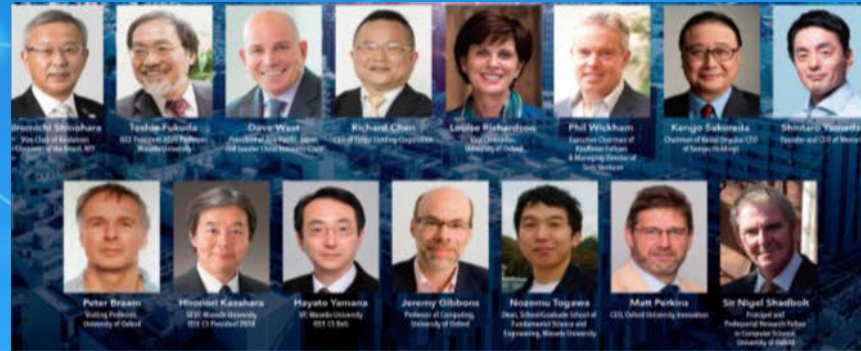


# WOI'21

**WASEDA OPEN INNOVATION FORUM 2021**

**早稲田オープン・イノベーション・フォーラム2021**

文部科学省 大臣官房審議官(科学技術・学術政策局担当) 梶原 将 氏  
経済産業省 大臣官房審議官(産業技術環境局・福島復興担当) 萩原 崇弘 氏



**IEEE**  
**World Largest**  
**Society**



**グリーン・コンピューティング・システム研究機構**  
**10周年記念講演会**

**研究院・研究機構の取り組み紹介**

**研究成果展開事業 社会還元加速プログラム (SCORE) Demo Day**

**学生の発表 (EDGE-NEXT、ビジネスコンテスト優勝者、DSコンペティション優秀賞受賞者の講演)**

**Oxford-Waseda**  
**Computer Science Symposium**  
(オックスフォード大学との大学間協定両大学トップ研究者の講演)

**早稲田知財活用ベンチャー紹介**



# Waseda University Carbon Net Zero Challenge –2021.11.1

<https://www.waseda.jp/netzero/>

早稲田大学は、世界の一員として、地球上の生命の維持、世界のさらなる発展のため、カーボンニュートラルの実現を、文理・産学・国を超えたオープンイノベーションで、全力で取り組んで参ります

## WASEDA Carbon Net Zero Challenge



### PROGRAM プログラム

15:30 - 15:34

開会挨拶

竹内 淳 研究院長

15:34 - 15:41

早稲田大学  
カーボンニュートラル研究宣言

田中 愛治 総長



15:41 - 15:50

ロボティクス・ICTのシステムインテグレーションによるCN貢献

菅野 重樹 理工学術院長  
次世代ロボット研究機構



### カーボンニュートラルの企業方針、早大との共同研究、今後の産学連携研究の方向性

コーディネーター 林 泰弘 (スマート社会技術融合研究機構長)

15:50 - 16:10

電力ネットワーク

～次世代エネルギーマネジメントで実現するカーボンニュートラル～

岡本 浩氏  
東京電力パワーグリッド株式会社  
取締役 副社長執行役員



林 泰弘 教授  
スマート社会技術融合  
研究機構

16:50 - 17:10

EV

～カーボンニュートラル実現のための日産の電動化戦略～

平井 俊弘氏  
日産自動車株式会社  
専務執行役員



草鹿 仁 教授  
次世代自動車  
研究機構

16:10 - 16:30

グリーントランスフォーメーション

～次世代型エネルギーサプライチェーンの構築～

宮田 知秀氏  
ENEOS株式会社  
常務執行役員 水素事業推進部・  
FCサポート室・中央技術研究所  
部長



本間 敬之 教授  
ナノライフ創研  
研究機構

17:10 - 17:30

建築・建設

～住宅・建築・都市のカーボンニュートラル～

小野島 一氏  
株式会社大林組  
執行役員 建築本部副本部長  
(建築設備・リニューアル担当) 兼  
技術本部副本部長



田辺 新一 教授  
スマート社会技術融合  
研究機構

16:30 - 16:50

通信ネットワーク・ICT

～IOWN構想と産学連携 -カーボンニュートラルに向けて-

川添 雄彦氏  
日本電信電話株式会社  
常務執行役員  
研究企画部門長



戸川 望 教授  
グリーン・  
コンピューティング・  
システム研究機構

お問合せ

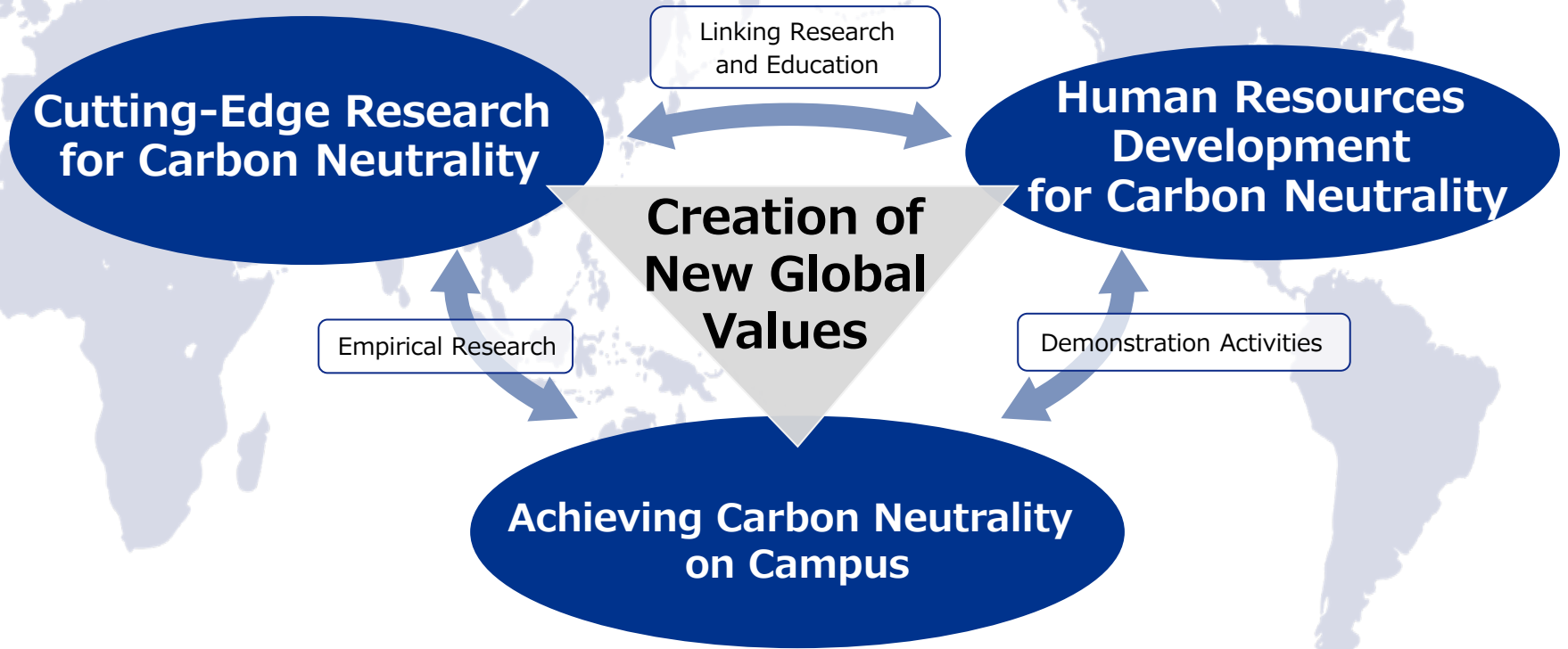
早稲田大学研究院事務局

✉ kenkyuin\_forum22@list.waseda.jp



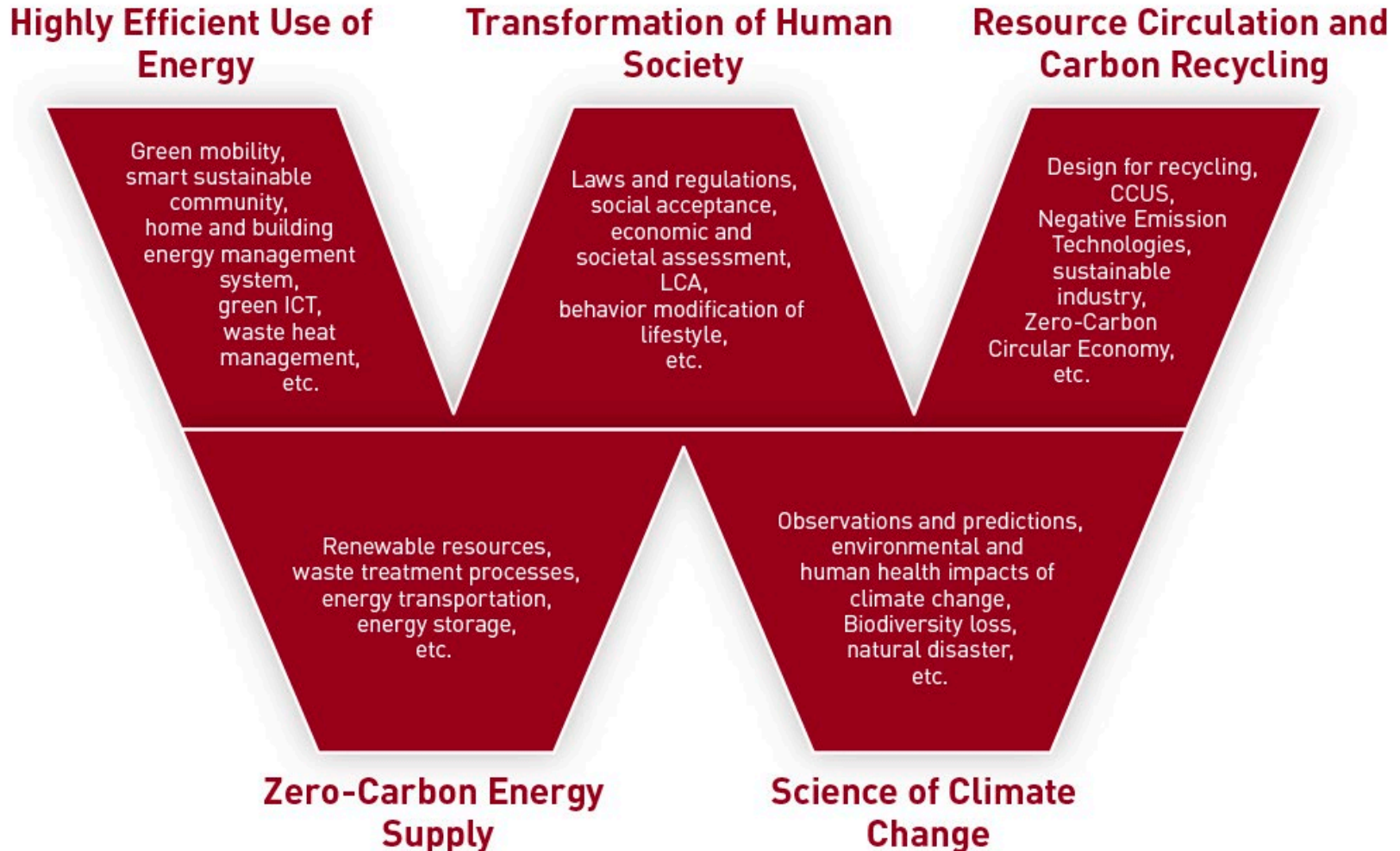
# WASEDA Carbon Net Zero Challenge 2030s

At Waseda University, we will contribute to the **realization of carbon neutrality on campus**, in the local community, in Japan, and globally, by focusing on further enhancing our ability to **conduct cutting-edge research** that can transform the future and the **fostering of human resources** that will pave the way to a new era.



# Researchers Making an "All-Waseda" Effort to Promote Carbon Neutrality

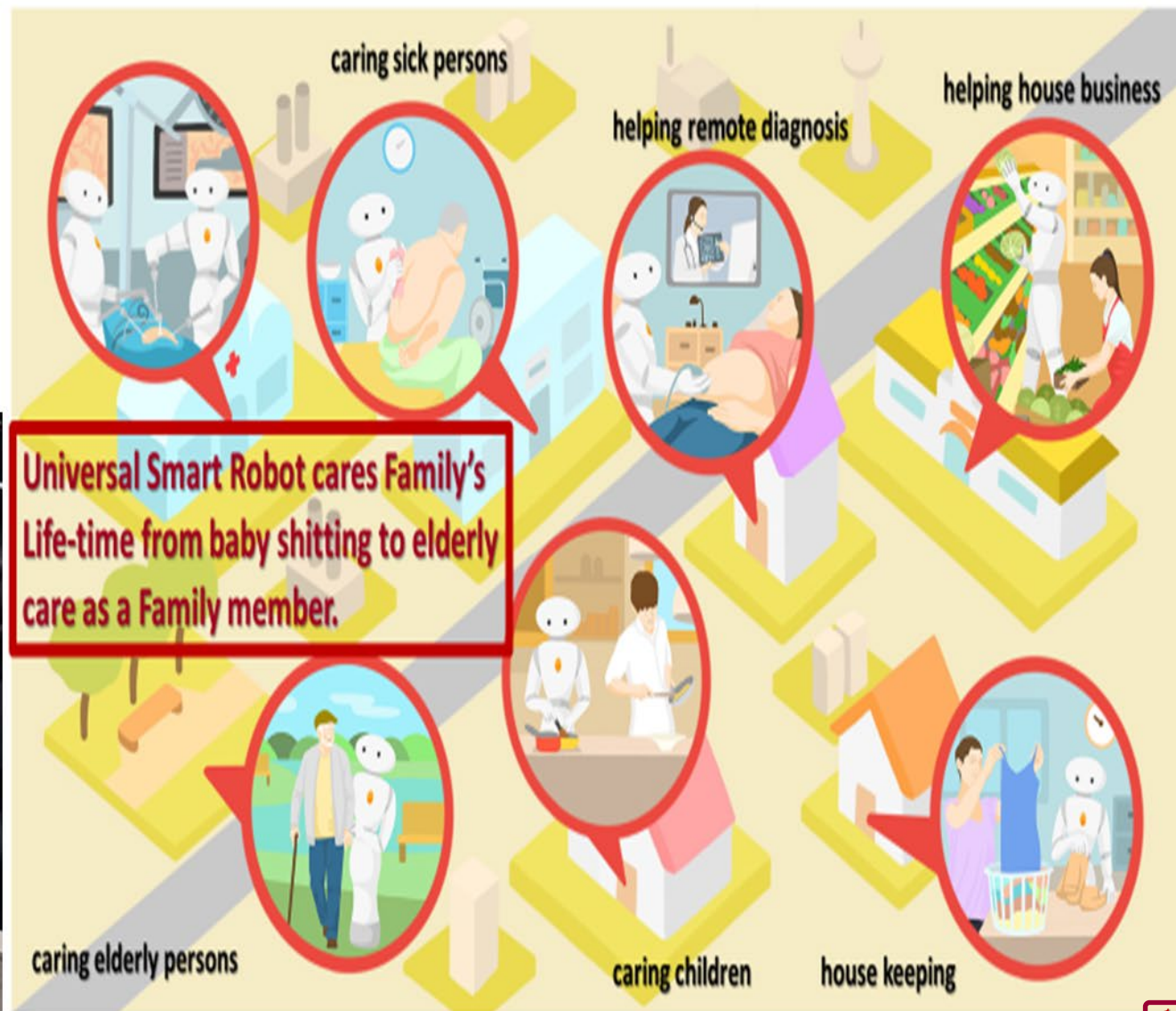
The Waseda Carbon Net Zero Challenge connects All Waseda researchers and researcher projects that contribute to climate change or carbon neutrality, and brings together research on new technological innovations and expertise in policy / business management.





# AIREC (AI-driven Robot for Embrace and Care) Led by Prof. Sugano

Supported by Japanese Government "Moonshot" Project from 2020





# Demo of NEDO Green Multicore Processor for Real Time Consumer Electronics at Council of Science and Engineering Policy on April 10, 2008

<http://www8.cao.go.jp/cstp/gaiyo/honkaigi/74index.html>

第74回総合科学技術会議【平成20年4月10日】



第74回総合科学技術会議の様子(1)



第74回総合科学技術会議の様子(2)



第74回総合科学技術会議の様子(3)



第74回総合科学技術会議の様子(4)

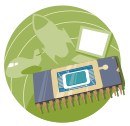
## Codesign of Compiler and Multiprocessor Architecture since 1985

4 core multicore RP1 (2007), 8 core multicore RP2 (2008) and 15 core Heterogeneous multicore RPX (2010) developed in NEDO Projects with Hitachi and Renesas

RP-1 (ISSCC2007 #5.3)	RP-2 (ISSCC2008 #4.5)	RP-X (ISSCC2010 #5.3)
90nm, 8-layer, triple-Vth, CMOS	90nm, 8-layer, triple-Vth, CMOS	45nm, 8-layer, triple-Vth, CMOS
51.9 mm <sup>2</sup> (9.98 x 9.98 mm)	104.8 mm <sup>2</sup> (10.91 x 9.88 mm)	153.8 mm <sup>2</sup> (12.4 x 12.4 mm)
1.0V (Internal), 1.8V (I/O)	1.0-1.4V (Internal), 1.8V (I/O)	1.0-1.2V (Internal), 1.2-3.2V (I/O)
600MHz, 4.32 GOPS, 16.8 GFLOPS	600MHz, 8.64 GOPS, 33.6 GFLOPS	648MHz, 13.70 GOPS, 115.00 GOPS, 36.20 GFLOPS
11.4 GOPS/W (32b換算)	18.3 GOPS/W (32b換算)	37.3 GOPS/W (32b換算)

Prime Minister FUKUDA is touching our multicore chip during execution.





# Future Multicore Products with Automatic Parallelizing Compiler



## Next Generation Automobiles

- Safer, more comfortable, energy efficient, environment friendly
- Cameras, radar, car2car communication, internet information integrated brake, steering, engine, moter control

## Smart phones



- From everyday recharging to less than once a week
- Solar powered operation in emergency condition
- Keep health

## Advanced medical systems



### Cancer treatment, Drinkable inner camera

- Emergency solar powered
- No cooling fun, No dust , clean usable inside OP room



## Personal / Regional Supercomputers



### Solar powered with more than 100 times power efficient : FLOPS/W

- Regional Disaster Simulators saving lives from tornadoes, localized heavy rain, fires with earth quakes

# World Top Computer Symposium ACM/IEEE ISCA 2025 will be held at Waseda University on June 21-25, 2025.

Co-Chairs: Prof. Jean-Luc Gaudiot (IEEE CS President 2017, UCI)  
Prof. Hironori Kasahara (IEEE CS President 2018, Ex-SEVP, Waseda)



## Waseda Univ. Main Campus Meeting Facilities

Waseda Open Innovation Valley  
(Variety Sizes of meeting rooms in side 5 minutes working area)

<b>Conference Center</b>  <ul style="list-style-type: none"> <li>450 persons</li> <li>100 persons</li> <li>80 persons</li> <li>50 persons</li> </ul>	<b>Rihga Royal Hotel</b>  <ul style="list-style-type: none"> <li>Lunch, Dinner, 1000 persons Banquet room</li> <li>several 200-300 hundreds persons meeting rooms: A few minutes from ISCA</li> </ul>	<b>ISCA Place: Okum Auditorium</b>  <ul style="list-style-type: none"> <li>1F: 1120 persons</li> <li>B1: 300 Persons</li> </ul>	<b>Research Innovation Center</b>  <ul style="list-style-type: none"> <li>180 persons *1</li> <li>50 persons *4</li> <li>40 persons meeting rooms *2</li> </ul>
<b>Waseda U. Main Campus</b>  <ul style="list-style-type: none"> <li>6000 persons</li> </ul>	<b>Ono Hall &amp; Waseda Tower</b>  <ul style="list-style-type: none"> <li>250 persons</li> <li>150 persons</li> <li>50 persons *2</li> <li>40 persons *3</li> </ul>	<b>Green Computing R&amp;D Center</b>  <ul style="list-style-type: none"> <li>180 persons *1</li> <li>30 (VIP Meeting)</li> <li>40 persons *3</li> </ul>	 

It is also well-known that the ACM Turing Award Lectures are held at the ACM/IEEE ISCA (International Symposium on Computer Architecture).