Establish Good Relationships between Vietnam and Japan

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Contents

- Introduction to Gunma University
- Introduction to Science & Engineering
- Introduction to Kobayashi Lab.
  - Collaboration with Industries
  - Globalization
  - Fun and Human Relationship
- Summary
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Gunma University has 4 Campuses

Maebashi 1: Education, Social and Information Studies
Maebashi 2: Medicine
Kiryu: Science & Engineering
Ota: Science & Engineering

Gunma’s Yuru-chara
Gunma chan
4 Faculties in Gunma University

- Faculty of Education
  220 students / year
  to be teachers in junior, junior high-schools

- Faculty of Social and Information Studies
  100 students / year
  to lead information society

- Faculty of Medicine
  medical doctor course  108 students / year
  nursing science course  160 students / year

- Faculty of Science & Engineering
  510 students / year
Many Hot Springs in Gunma

We, Japanese
love bathing
In hot springs.
Autumn Season in Gunma

Ikaho shrine which guards Ikaho hot spring in Gunma.

Ikaho shrine

Red leaves of autumn in Ikaho hot spring area
Beautiful Nature in Gunma

Insect Zoo
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Science & Engineering: 5 Departments

- Chemistry and Chemical Biology
- Mechanical System Engineering
- Civil and Environmental Engineering
- Electronics and Informatics
- General Science & Engineering
Electronic Engineering Research Fields

Kiryu Campus

8 professors
12 associate professors
5 assistant professors

3 major areas
- Electronic Devices
- Measurement, Control and Power Electronics
- Information, Communication and System
Manufacturing Industry in Gunma

Many manufacturing companies in Gunma Electronics, semiconductor, automotive, machinery....

Historical Factory in Meiji Era
Kiryu Campus for Faculty of Engineering

Founded as an engineering college for silk long time ago.
Kiryu: Capital of Silk in Japan
Silk Industry was Popular

Historical house
Ancient, Modern Aspects in Kiryu

Kinopy
Full of Greenery in Kiryu

Cherry Blossoms

Kiryu City View from a Neighbor Mountain
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Research & Education Area

Analog & Mixed-Signal Integrated Circuit Design

Our research result examples:

TV tuner application IC & evaluation board
(collaboration with Sanyo Semiconductor)

Communication application analog-to-digital converter
(collaboration with STARC)
Research Result Examples

Low-Power Successive Approximation Analog-to-Digital Converter IC (collaboration with STARC)

Charge Pump Circuit (with Sanyo Electric)
Active Research

Journal Publication: 4-6 papers/year
- Trans. of Institute of Electronics, Information and Communication Engineers (IEICE)

International Conference Publication: 5-8 papers/year
- IEEE International Test Conference
- IEEE Asia Pacific Conference on Circuits & Systems
- IEEE Asian Solid-State Circuits Conference

Domestic Conference Publication: ~20 papers/year
- Several conferences in Japan

Patent Applications (with industry):
- 3-7 applications/year

Publish or Perish!
Members of Laboratory

Full Professor: Haruo KOBAYASHI
Associate Professor: Nobukazu TAKAI
Visiting Associate Professor: Kentaroh KATOH
Engineer: Nobuyoshi ISHIKAWA
Ph.D. Students: 5
MS students: 28
Bachelor students: 11
Research students: 3

Many excellent researchers and students are coming.
Lab. Members & Visiting Professors
Lab. Members
International Students in my Lab.

Currently 17 international students from 6 countries
USA, China, Malaysia, Iran, Bangladesh, Peru
Former from
China, Indonesia, Azerbaijan, Malaysia, Peru
Japanese Students in my Lab.
Laboratory’s Policy

Open, Fair, Independent

- Open, fair to anyone regardless of his/her nationality, affiliation, ethnics, belief/religion, gender or age.
- All of research / education contents are open.
- We are independent in all aspects.

A lot of excellent people are coming.
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Merits of Industry Collaboration

- Aggressive collaborations with industries in semiconductor, electronics fields pushes our lab. to higher level.
- Advanced technologies are developed.
- Job/Internship opportunities for students
- Research funds are supported.

I learned importance of industrial collaboration when studying at UCLA.
Current Joint Research Projects

Semiconductor Technology
Academic Research Center (STARC)
   Mixed-Signal LSI Testing Technology

Sanken Electric Power Supply Circuit
Dialog Semiconductor

Sanyo Semiconductor Wideband Low Noise Amplifier
Past Joint Research Projects (1)

Agilent Technologies
   Electronic Measurement Technologies

Sumitomo Electric
   Envelope-Tracking Power Amplifier for Base-Station

Sharp
   Direct-RF Sampling ADC

Renesas Electronics
   Digital Calibration Algorithm for ADC

Toshiba Microelectronics
   High-precision ADC for Power-Meter Applications
Past Joint Research Projects (2)

Asahi Kasei Electronics
Nichicon

Yamaha
Delta-Sigma AD/DA Converters

Tokyo Sokki Kenkyujo Co., Ltd.
Strain Measurement Circuit

Power Supply Circuit
Adjunct Professors from Industry

Prof. H. Aoki (Semiconductor Device Modeling, former in Hewlett Packard Lab.)
Prof. M. Ochiai (Power Electronics, Sanken Electric)
Prof. Y. Kobori (Power Electronics, former in Hitachi)
Prof. K. Onda (Power Electronics, Hitachi)
Prof. S. Banba (High Frequency Circuit, Sanyo)
Prof. K. Ueda (Semiconductor Process, Sanyo)
Prof. T. Miki (Analog IC Design, Renesas)
Prof. T. Matsuura (Analog IC Design, former in Renesas)
Prof. K. Hatayama (LSI Testing Algorithm, former in STARC)
Prof. T. Yamaguchi (LSI Testing Technology, Advantest Lab)
Industry-Oriented Education

● Adjunct professors and invited lectures provide industry-oriented lectures in electronics fields.
● Students can learn advanced and practical technology.

Prof. Y. Sugimoto of Chuo Univ. former in Toshiba.
Technical Meeting of Analog Integrated Circuit at Gunma University

- Founded in 2003.
- Invited many excellent researchers from industry and academia.
- More than 200 seminars for 10 years.

Semiconductor device, (analog, RF, power) circuit, modeling, measurement, testing, system, applications, EDA, management, education, ....
Summer Internship Program

2-4 weeks in summer vacation

The following companies have kindly accepted our students for internship:
Sanyo, Hitachi, Renesas, Sharp, Advantest, Asahi Kasei Electronics, Toko, Seiko Instru, ZHine Electronics, Sony, Nichicon Analog Devices, Toshiba, Yamaha, Verigy, Texas Instruments, and many.
Internship in the USA

Cirque Corp. (ALPS Electric) at Salt Lake City in the US accepted two students for the internship. Everything was kindly supported by them.

From Oct. 6 to Oct. 31 in 2008.
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My Experiences of Study in the USA

- University of California, Los Angeles (UCLA)  
  Electrical Engineering Department  
  Integrated Circuits and Systems Laboratory  
  Master course 1987-1989

- 1-year work experiences in Silicon-Valley in the US.

Invitation of UCLA Professor Asad Abidi to Gunma U. in 2007.
IEICE International Conference on Integrated Circuits, Design, and Verification
Mo Chi Minh City, Vietnam (Nov. 15-16, 2013)
Presentations: 11 papers, Attendees: 20 members

IEEE Asian Test Symposium
Yilan, Taiwan (Nov. 18-21, 2013)
Presentations: 2 papers, Attendees: 4 members

Five international students will present papers.
We have presented 6 papers and 23 members attended to IEEE Asia Pacific Conference on Circuits & Systems Kuala Lumpur, Malaysia, Nov. 2010.
International Conference (3)

IEEE Conferences in Taiwan in 2012

IEEE Conference in Korea in 2011.

Student Short Stay in the USA

- Visit to Prof. Fred Lee Lab, Virginia Tech in 2008.

- 5 graduate students stayed at UCLA in Sept. 2011.
Job Employment after Graduation

International graduates of my lab are working for

Sanyo Electric
Renesas Electronics
Texas Instruments, Japan
Analog Devices Inc. Japan
Fujitsu Laboratories
New Japan Radio Co., Ltd.
Tokyo City University
Alps Electric, and many.
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Local Society Support

● Kind Local community occasionally takes care of international students.

● Rotary-Yoneyama scholarship recipients from my lab:
  Mr. Haijun Lin, Ms. Gao Hong
  Mr. Santhos Ario Wibowo
Lab & Marriage Party
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All of you are welcome to Gunma U.

- Kiryu is an attractive city.
- We have been accepting many international students.
- You can learn advanced and practical technologies in electronics and LSI fields.
- There are plenty of chances for conference presentations and paper publications.
- You can have many good friends.

Globalization is important.
Appendix

For students who wish to study
in Faculty of Science and Technology at Gunma University
Our department has accepted students from Vietnam.

Requirements for success:
(1) Good academic background
(2) Language skill (Japanese and English)
(3) Finance for living cost and tuition fee in Gunma University

Master course (2 years)
Enterance exam. in Aug, Dec.
You have to come to Gunma University to take either of them.

Ph.D. Course (3 years)
Enterance exam. in Aug, Dec, March. E-mail interview is acceptable.
You do not have to come to Gunma University to take one of them.

Enrollment: April or October
RF

- A Power-Efficient Noise Canceling Technique Using Signal-Suppression Feed-forward for Wideband LNAs

ADC/DAC

- Noise-Shaping Cyclic ADC Architecture
- SFDR Improvement Algorithms for Current-Steering DACs

Delta-Sigma

- Phase Noise Measurement and Testing with Delta-Sigma TDC
- Study of Complex Multi-Bandpass ΔΣ Modulator for I-Q Signal Generation
- Delta-Sigma Digital-to-Time Converter and its Application to SSCG Modeling

Modeling

- Typical n-MOSFET Modeling using A Skewing Method
Research topic

Power Supply Circuit
- Design of a Simple Feed-Forward Controller for DC-DC Buck Converter
- Single Inductor Multi Output DC-DC Converter Design with Hysteresis Control
- A Single Supply Bootstrapped Boost Regulator for Energy Harvesting Applications

Software
- Automatic Synthesis of Comparator Circuit Using Genetic Algorithm

Self-Calibration
- An Analysis of Stochastic Self-Calibration of TDC Using Two Ring Oscillators
- Digital Compensation for Timing Mismatches in Interleaved ADCs