

Research Introduction for IIST students

University Information

HOSEI University
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Please contact us via the inquiry form on the website.

Hosei Alumnus, Masahiro Hara invented QR code (1994) Denso Co. Ltd. Graduated from Hosei University in 1980







IIST Curriculum English based graduate program of core majors with interdisciplinary fields



The goal of IIST is to foster scientists and professional engineers actively play an important role in the global community. With the optional Japanese reinforcement program, students can also acquire Japanese technical communication skills which strengthen their career development. Each IIST student will belong to one of eight study majors listed below.

Students can earn strong academic discipline in their major. In addition to these core major oriented curriculum, IIST provides a comprehensive learning environment which enables students to take interdisciplinary classes depending on the nature of their study. Namely there are six interdisciplinary fields of study.

Global Information Systems field to develop efficient and effective service systems in the cyber world (large scale system integration, cyber information security, software engineering, parallel and distributed systems, computer aided education, evolutionary computation)

Ubiquitous Network and Communication Systems field to develop ubiquitous/IoT systems and supporting network and communication systems (IoT technology and systems, smart sensors, data communication and networking technology, wireless communication systems)

Advanced Media and Information Processing field to develop methods for the image and data processing (augmented reality, computer graphics and vision, bigdata analysis, natural language processing, artificial intelligence, pattern recognition, biometrics, machine learning)

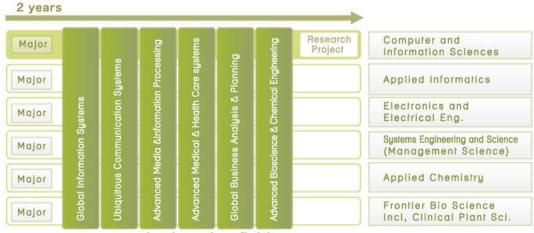
Advanced Medical and Health Care Engineering field to develop systems for medical diagnoses, treatment and health care (CT image processing, medical imaging, X-ray detector array design, biomedical signal interpretation and analysis, health care/stress management systems)

Global Business Analysis and Planning field to develop the methods for quantitative analysis of business related activities (mathematical finance theory, stock market analysis, reliability and quality assurance, portfolio optimization, operations research, business innovation)

Advanced Bioscience and Chemical Engineering field to develop advanced theory and methods for resolving global issues on environment, medicine, pharmacology, and agriculture (cell biology, biological systems, clinical plant science, materials chemistry, and environmental chemistry)

IIST learning structure has been shown below for the master' s course. Doctoral students are to be focused on their research work, yet required to take a few course work classes. The IIST offers high standard curriculum accredited by MEXT: Japanese ministry of education, culture, sports, science and technology.

Major	Meng,Msc	Ph.D.
Computer and information Sciences	~	V
Electrical and Electronic Eng.	V	/
Applied Informatics (Information and Communications Technology)	~	~
Systems Engineering and Science (Management Sciences Track)		/
Applied Chemistry	~	V
Frontier Bioscience (Frontier Bioscience and Clinical Plant Science)	V	V
Mechanical Eng.	n/a	V
Systems Engineering and Science (Advanced Sciences Track)	n/a	×



cross-major learning fields

情報科学研究科 情報科学専攻

Graduate School of Computer and Information Sciences [Master's and Doctoral] Major in Computer and Information Sciences



MINA AKAISHI[赤石 美奈] Intellect engineering

Information compilation technology based on story structure; management, search and visualization techniques for knowledge media; science of historical



KAORU UCHIDA [内田 薫] Pattern and image recognition and its applications

Applications of pattern and image recognition, biometrics, real-world innovation with information



SATOSHI OBANA [尾花 賢] Encryption, Information security

Encrypting protocols, including secret sharing schemes and secure evaluation



NOBUHIKO KOIKE [小池 誠彦] Parallel and distributed processing architectures and their applications

Research into practical applications for SMP PCs and PC clusters, intelligent parallel processing applications, implementation of distributed and parallel processing environments



YUJI SATO [佐藤 裕二]

Evolutionary computation, Intelligent computing, Soft computing

Genetic algorithms, Evolutionary algorithms, Swarm Intelligence, Reinforcement Learning for Dynamic and/or Multimodal problems, Distributed evolutionary computation, Evolutionary multi-objective optimization



Toshihisa NISHIJIMA [西島 利尚] Algebraic coding theory and its applications

Aasymptotically good algebraic coodes, Weight enumerators, Maximum distance separable codes



KATSUNOBU ITO [伊藤 克亘] Speech processing, Multimodal dialogue systems,

Music information processing

Speech recognition, multimodal dialogue systems, speech interfaces, information retrieval, music nformation processing, data science



VLADIMIR SAVCHENKO [ウラディミール サブチェンコ] Geometric modeling, CG, animation

Hybrid volume modeling, which include mathematical models, numerical methods, software algorithms, and programming realization



TAKAFUMI KOIKE [小池 崇文] 3D imaging technology, Computer graphics, Augmented reality

Real world-oriented media, optical information processing, physical computing, real-time rendering, computational photography



AKIRA SASAKI [佐々木 晃]

Programming language processing systems, Domain-specific languages, Attribute grammars

Programming language processing system implementation technologies and theory



YASUNARI ZEMPO [善甫 康成]

Computational methodology and computational materials science, Development of new computational algorithms in large-scale parallel computers

High perfomance computing and its applications such as optical propergations and optical properties of



HIROSHI HANAIZUMI [花泉 弘] Image processing and recognition, Remote sensing, Image measurement

Remote sensing, image processing for medical purposes, facial recognition, and mobile camera



SOICHIRO HIDAKA [日高 宗一郎] Programming languages, Infrastructure software

Programming languages, Program transformation, Bidirectional transformations and their applications to model dirven engineering



RUNHE HUANG [黄 潤和] Artificial intelligence, Machine learning, Neural network, Data mining and knowledge fusion

Knowledge representation and configuration. Knowledge discovery and fusion, Human cognitive process modeling, Associative memory and recall



HIROSHI HOSOBE [細部 博史] User interfaces, Information visualization, Computer graphics, Constraint programming

Mathematical approaches to the construction of visual and interactive systems



SHUICHI YUKITA [雪田 修一] Visualization of geometrical and abstract

Using diagrams and other methods to visualize abstract concepts



YAMIN LI[李 亜民]

Computer architectures, Parallel and distributed systems, Mobile ad hoc networks

nterconnection networks, routing and broadcasting



TOSHIO HIROTSU [廣津 登志夫] Internet, Operating systems, Ubiquitous

■ Academic Areas
■ Keywords

Dynamic relay control mechanisms for distributed virtual routers



SATORU FUJITA [藤田 悟] High speed XML processing, Web services, Service-oriented software

Service strategy modeling, social simulation analyses, basic technologies for implementing the XML and Web services that sustain the service industry-centered



JIANHUA MA [馬 建華]

Ubiquitous network and computing, smart object, space and service, autonomic and trusted system Ubiquitous networking and communication



SHAOYING LIU[劉 少英]

Software engineering, Automatic Software Testing, Formal engineering methods for Software Quality Assurance, Software Error Prevention, Intelligent software engineering environment

Testing-Based Formal Verification, Automatic Test Data Generation, Automatic Program Inspection and Analysis, Formal Specification, Safety and Security Verficiation and Testing



TORU WAKAHARA [若原 徹] Character recognition, Distortion-tolerant image matching, Pattern recognition

Text detection and character recognition in scene images, object tracking, and human behavior

理工学研究科 機械工学専攻

Graduate School of Science and Engineering [Doctoral only] Major in Mechanical Engineering



KAZUYOSHI ARAI[新井 和吉] Composite materials, Aerospace structural materials, Strength of materials

High velocity impact, Sand erosion, Bird strike



HIROAKI OSAWA [大澤 泰明] Advanced materials engineering

Light metal sheet forming, Superplasticity, Non-Ferrous alloys



KIYOTAKA SAKINO [崎野 清憲] Fracture mechanics, Material properties Strength of materials Impact engineering



CHIHARU ISHII [石井 千春] Control engineering, Medical robotics, Rehabilitation engineering, Assistive technology

Development of laparoscopic surgical robot, power assist suit, myoelectric prosthetic hand and its sensory feedback system, etc.



TADASHIGE KAWAKAMI [川上 忠重] Combustion engineering, Energy conversion engineering

Combustion, Internal combustion engine, Emission,



GENCI CAPI [F+L ゲンツィ] Intelligent Assistive Robotics, Multi-Robot Systems

Wheelchair Robot, Robot navigation, Industrial robot object recognition, Evolutionary Robotics, Neural



HIDEAKI TSUKAMOTO [塚本 英明] Mechanics of materials, Materials science,

Functionally graded materials, Plastic forming high-temperature composites, Creep, Powder metallurgy



SHIGERU HAYASHI [林 茂] Reacting fluid dynamics, Gas turbine combustion, Liquid atomization and spraying

Low NOx combustion, Spray diagnostics and combustion, Low emissions gas turbine technology



GAKU MINORIKAWA [御法川 学] Mechanical acoustics. Environmental engineering, Aviation technology Noise control, Aeroacoustics, Sound quality, Small fan design, Aircraft design, 3D printing



HOSHIO TSUJITA [辻田 星歩] Computational fluid dynamics, Fluid machinery Turbomachinery Highly loaded turbine cascade Secondary flow loss reduction

■ Academic Areas
■ Keywords



MOTOHISA HIRANO [平野 元久] Nanotribology, Atomistics of friction, Computational mechanics

Atomistic simulation of friction, Atomic-scale measurement of friction. Computational mechanics of bulk materials

理工学研究科 電気電子工学専攻

Graduate School of Science and Engineering [Moster's and Doctoral] Major in Electrical and Electronic Engineering



KAZUYUKI ITO [伊藤 一之] Perceptual information processing and intelligent systems, Systems engineering

Intelligent robotics, Rescue robot



TOSHIMICHI SAITO [斉藤 利通] Nonlinear circuits, Neural networks, Swarm intelligence, Power electronics Binary Neural Networks, Chaotic Circuits, Stability



YOSHIHUMI OKAMOTO [岡本 吉史] Computational Electromagnetics Optimal Design Multi-physics High-speed Large-scale Computation Finite Element Method, Topology Optimization, Adjoint Variable Method, Parallel Computation,



JUN SHIBAYAMA [柴山 純] Functional element engineering Finite-difference time-domain method, Terahertz



JUNJI YAMAUCHI [山内 潤治] Electromagnetic wave transmission engineering, Design of passive optical devices Beam-propagation method, Polarization converter,

Low-power, high-performance, VLSI design, video coding, HEVC, H.264/AVC, compressive sensing

JINJIA ZHOU [周 金佳] MASTERIS ONLY

Algorithms and ASIC/FPGA architectures for

multimedia signal processing



AKIRA YASUDA [安田 彰] Electronic circuit engineering control engineering Analog-Digital converter, Analog Integrated Circuit, Direct Driven Technique, Digital Speaker, Multi-coil

■ Academic Areas
■ Keywords

■ Academic Areas
■ Keywords

Academic Areas Keywords

理工学研究科 応用情報工学専攻

Graduate School of Science and Engineering [Master's and Doctoral] Major in Applied Informatics



/ SHIGERU AKAMATSU [赤松 茂] KANSEI information engineering visual pattern recognition systems, facial image synthesis, human information processing

KOICHI OGAWA [尾川 浩一]

Image processing, Medical imaging

computed tomography, image processing, medical imaging, x-ray detector, simulation technology

Intra-body communication, Electro-magnetic shielding, Organic photovoltaics, Optical coherence tomography

MITSURU SHINAGAWA [品川 満]

IT engineering, Ubiquitous networks, Wireless networks, Optical measurement



HITOSHI IYATOMI [蒲富 仁] MASTER'S ONLY Intelligent information processing, Image recognition and analysis, Medical engineering Deep learning, computer vision, machine learning, image proecssing, text mining, medical engineering



ATSUSHI KANAI [金井 敦] Data networks and security Data comunications cyber security, internet protocol, web service, privacy



MAKOTO HIRAHARA [平原 誠] MASTER'S ONLY Biological information processing Vision, Memory, Neural networks, Machine learning



AKIHIRO FUJII [藤井 章博] Distributed system design Web Service, Semanitc Web, Collective Intelligence

KAZUO YANA [八名 和夫]

Data processing engineering







KOICHI WADA [和田 幸一] Theoretical computer science Computation, Parallel/Distributed Algorithms, Computer Aided Education

Ubiquitous health care system, biosignal big data processing, Mental stress test via heart rate variability, Cardiac risk assessment



LEI LI [李磊] Intelligent information engineering, Algorithms Fast Algoritms, Parallel Algorithms, Soft Computing, the Computational Complexity

理工学研究科 システム理工学専攻 (創生科学系)

Graduate School of Science and Engineering [Doctoral only] Major in Systems Engineering and Science (Advanced Sciences Track)



SADANORI OKAMURA [岡村 定矩] Galactic astronomy, Observational cosmology

galaxies, clusters of galaxies, early universe, astronomical image processing



YUTAKA KATO [加藤 豊] Probability theory, Operations research Analytic Hierarchy Process



SHUICHI SATO [佐藤 修一] Gravitational wave physics, Experimental tests of general theory of relativity Gravitational wave, Laser interferometory



TAKASHI KASUGA [春日 隆] Radio astronomy, Developing highly sensitive electromagnetic wave detection technologies Radio astronomy, Developing highly sensitive electromagnetic wave detection technologies



KAZUYUKI KOBAYASHI [小林 一行] Sensing engineering, Sensor signal processing mobile robot, outdoor navigation, intelligent sensing



ISAMU SHIOYA [塩谷 勇] Time series processing, Artificial intelligence Complex systems, Traffic flow, Machine Language



KAORU SUZUKI [鈴木 郁] Ergonomics, Human factors, Human information sensing

Ergonomics, Human factors, Human information

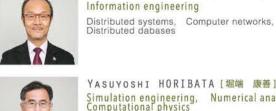


Software engineering software modeling, requirements engineering, self-adaptive systems

YUKARI MATSUO [松尾 由賀利] Laser spectroscopy, Atomic and molecular physics, Quantum electronics laser spectroscopy of atoms and molecules laser

ablation processes

TETSUO TAMAI [玉井 哲雄]



YASUYOSHI HORIBATA [堀端 康善] Simulation engineering, Numerical analysis, Computational physics

numerical simulation, optimization, data assimilation, parallel computing

MAKOTO TAKIZAWA [滝沢 誠]



TAKAO MIURA [三浦 孝夫] Databases, Machine Learning Data Models, Data Bases, Data Mining, Statistical

理工学研究科 システム理工学専攻(経営システム系)

Graduate School of Science and Engineering [Master's and Doctoral] Major in Systems Engineering and Science (Management Science Track)



SHIN ISOJIMA [礦島 伸] MASTER'S ONLY Nonlinear integrable systems
Integrable systems, Difference equations, Cellular automata, Ultradiscretization

TOSHIYUKI KATSURA [桂 利行]

K3 surface, Calabi-Yau variety, Elliptic surface,

Abelian variety, Algebraic geometric code,

Coding theory, Algebraic geometry



TADASHI URATANI [浦谷 規] Financial engineering Derivative pricing, No aribitrage, Black-Scholes formulas







KENJIRO TAKAZAWA [高澤 兼二郎] MASTER'S ONLY Mathematical engineering, Discrete mathematics Combinatorial optimization, Matching theory



NOBUYUKI TAMURA [田村 信幸] Applied probability theory, Operations research Optimal maintenance policy, Degradation process modeling, imperfect maintenance

■ Academic Areas
■ Keywords

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■ Keywords



EISHI CHIBA [千葉 英史] MASTER'S ONLY Operations research
Discrete algorithms, Scheduling, Combinatorial optimization

TATSUYOSHI MIYAKOSHI [宮越 龍義]

Financial crisis, Japanese and Asian financial system

Applied financial analysis



YOICHI NAKAMURA [中村 洋一] Economic engineering Economic statistics, System of national accounts, Econometric analysis



KAZUHIRO YASUDA [安田 和弘] MASTER'S ONLY Stochastic analysis; Mathematical finance Stochastic differential equations, Derivative pricing, Portfolio optimization, Stochastic numerical analysis



HIROYUKI GOTO [五島 洋行] Operations research, High-performance computing Discrete event systems, scheduling, geographic computation

理工学研究科 応用化学専攻

Graduate School of Science and Engineering [Master's and Doctoral]



Major in Applied Chemistry

TAKAYA AKASHI [明石 孝也] Inorganic materials chemistry, solid state electrochemistry

Solid state reactions, Joining, Sintering, Grain growth, Oxidation, High temperature, Ionic onduction



HIRONORI OGATA [緒方 啓典] Materials Science, Solid state chemistry

Organic-inorganic hybrid nanomaterials, Biomass-based materials, Development of new functional nanomaterials for energy and sustainability and their device applications



TAKAMASA ISHIGAKI [石垣 隆正] Inorganic synthetic chemistry Ceramic material, Laser synthesis, Wet chmeical synthesis, Photocatalyst, Optical Material



ATSUSHI KAWACHI [河内 敦] Organo main group element chemistry; organometallic chemistry

Maig group element, Silicon, Boron, Organic synthesis



KENJI SUGIYAMA [杉山 賢次] Polymer chemistry, Organic chemistry Biodegradable polymer, Conjugated polymer, Fluoropolymer, Water-soluble polymer



TAKAMASA MORI [森 隆昌]
Chemical engineering, powder technology
Slurry, Suspension, Dispersion control of nano
particles



KAZUYUKI TAKAI [高井 和之] Materials Science, Physical Chemistry Electronic and energy devices, Catalytic activity, Graphene, 2D-Materials, Electronic properties



AKIHIRO YAMASHITA [山下 明泰] Chemical and biomedical engineering

Transport phenomena in biological systems and in medical devices, Drug delivery systems



理工学研究科 生命機能学専攻(生命機能学領域)

■ Academic Areas
■ Keywords

Graduate School of Science and Engineering [Master's and Doctoral] Major in Frontier Bioscience (Frontier Bioscience Field)



TOMOYUKI KANEKO [金子 智行] Biophysics, cell biology

Liposome, cell reconstruction, community effect, cardiomyocyte, multi-electrode array, cardiotoxicity, agarose microchamber



IKURO KAWAGISHI [川岸 郁朗] Molecular biology, biophysics

Bacteria, signal transduction, receptor, molecular nachine, protein structure and function, gene



TSUTOMU SATO [佐藤 勉] Molecular biology

Virus, phage, bacteria, differentiation, DNA ecombination, gene expression



YOSHIYUKI SOWA [曾和 義幸] Biophysics

Molecular Motor, single-molecule detection



ANTONIO TSUNESHIGE [常重 アントニオ] Biophysical chemistry, protein science, biomolecular spectroscopy

Hemoproteins, allostery, protein hydration, macromolecular crowding, protein refolding,



MASAFUMI HIRONO [廣野 雅文] Cell biology, Molecular biology

Cytoskeleton, centrosome, cilia, flagella, cell motility,



NAOKI MIZUSAWA [水澤 直樹]

Phototrophic biology

cyanobacteria, photosynthesis, photosystem, lipid, vironmental stress



KANEYOSHI YAMAMOTO [山本 兼由] Molecular biology, genome biology

bacteria, transcription regulation, gene expression, nucleoide, signal transduction

理工学研究科 生命機能学専攻(植物医科学領域)

■ Academic Areas
■ Keywords

Graduate School of Science and Engineering [Master's and Doctoral] Major in Frontier Bioscience (Clinical Plant Science Field)



SEIJU ISHIKAWA [石川 成寿]

Plant clinical science

Plant fungal disease, Ecologigal control



KENRO OSHIMA [大島 研郎] Clinical Plant Genomics

Phytoplasma, plant pathogenic bacteria, genome



Toshio SANO [佐野 俊夫] Plant nutrition and physiology

Plant physiological disease, Mineral transporter,



Botanical medicine. applied entomology, plant acarology

AKIO TATARA [多々良 昭夫]

Insect pest control, IPM



TAKESHI NISHIO [西尾 健] Botanical medicine

Plant virology, Epidemiology

HIROSHI HAMAMOTO [濱本 宏]

Plant pathology, botanical medicine Plant pathogenic bacteria molecular diagnostic of



Motivation for Further Studies

When I was working at Vinh Long Province Department of Agriculture & Rural Department in Vietnam as a technical staff. I tried to control Colletotrichum diseases. However, I failed to do it and thought that I don't have enough knowledge about plant pathology. The best way for me and for farmer is to gain enlarge knowledge. Our department is unique as it focuses on Clinical Plant Science. I believe that I can improve my skills in this Department.

What I'm studying

The Colletotrichum, one of a genus of fungi, includes many plant pathogens. In Hosei University, I study morphological and molecular analyses to identify species of Colletotrichum from symptoms on tropical plants. Also, I learn how to know about pathogenicity of the fungi. I have many friend in my lab and, they are very kind and friendly. They always try to communicate with me by English and give me assistance whenever I face experimental problems.

My dream has come true

I visited Hosei University for a week in March, 2016 as a participant of Japan-Asia youth exchange program in science called Sakura Exchange Program. Through the program, I touched the frontier of cutting edge technologies of Japan. I also had a chance to meet Prof. Iyatomi who is my current research supervisor. He introduced us his research on applications of artificial intelligence to image processing. I am particularly interested in his research on plant disease diagnoses based on the leaf image big data since the research, I believe, could help the farmers of my country Vietnam. These exciting experiences in Japan made me decide to enroll in IIST. I have been enjoying both research and daily life here in Japan. Japanese language classes are also helpful for developing my future career to be a bridge engineer between Vietnam and Japan.

My research

My research topic is to develop an image processing system for plant disease diagnosis. Early diagnoses of the plant disease are important to prevent wide spread of virus disease over the farming field. Damage of such virus disease spread has been estimated over a 100 billion JPY annually. To overcome the current limitation of making diagnoses by human experts, I am trying to introduce the artificial intelligence technology to solver the issue. Thanks to the kind guidance of Professor lyatomi, I developed the prototype system for the plant leaf image pattern classification using the deep learning technique. This is an interdisciplinary project with the people in bioscience major. I am glad to have such a wonderful chance to apply my IT technology to other field of science.



HUU QUAN Cap (Major in Applied Informatics / enrolled in 2016)



GUO AO (Major in Computer and Information Sciences exposed in 2016)

Motivation

As a student under DDP (Double Degree Program) exchange program, I studied one year in Hosei University under the supervision of Professor Jianhua Ma. I started doing the research of Cyber Individual right after I came to Hosei to meet my supervisor. Cyber-Individual with a short term 'Cyber-I', is a real individual's counterpart in cyberspace. During the DDP study, we discussed much about this research and conceived some new ideas based on Cyber-I, especially Cyber-Gene. During a year's study in Hosei university, I learned advanced information science in terms of ubiquitous and pervasive computing. Hence, I decided to continue my research on Cyber-Gene by IIST program.

Current Status and Future studies

In order to establish a platform for the development of Cyber-I, I built a Smartphone-based system for personal data management and personality analysis in my DDP period. Cyber-Gene, analogous to Gene for human, seems a new vision of Digital Gene to Cyber Individual. But Cyber-Gene is still on the conceptual phase now. In order to guarantee a comprehensive personal data for further research on Cyber-Gene, I proposed a context-aware scheduling in personal data collection from multiple wearable devices in the first doctoral year. In my future study, I' m going to focus on personality computing to approach Cyber-Gene.