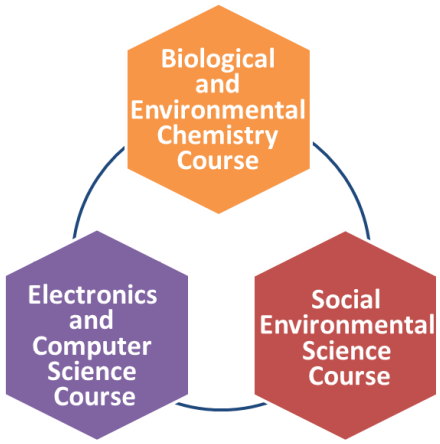
近畿大学大学院
産業理工学研究科
KINDAI UNIVERSITY GRADUATE SCHOOL OF HUMANITY-ORIENTED SCIENCE AND ENGINEERING

Fukuoka

WE ARE CULTIVATING SPECIALISTS FOR THE NEW ERA AIMING AT THE RECONCILIATION OF THE HARD AND SOFT SCIENCES.

The remarkable development of scientific technology in recent years is bringing about changes not only to industrial structure but also social form. At the same time, it is obvious that global environments are changing at the cost of humans' social activities. "Engineering," the knowledge and technology of pursuing economic efficiency and rationality, which has been supporting economic development up to the present date, is about to approach a transition phase. In order to meet the needs of the times to focus on a global concept that covers human factors across the whole earth in relation to technological activities, all the courses are aiming at characteristic education and research supporting the motto "Reconciliation of Hard Science and Soft Science."



Reconciliation of Hard Science and Soft Science

In 2013, Kinki University restarted the Graduate School of Humanity-Oriented Science and Engineering under the new system of "1 Major, 3 Courses" as one of its 11 graduate schools. In order to support Japan, a technology-oriented nation, under the increasingly intensifying international situation, an enormous responsibility has been imposed on graduate schools to cultivate high-level technical experts. This graduate school is aiming at cultivating human resources who acquired practical knowledge and technology, while meeting the needs of advanced industrial technology and having both international competing power and cooperativeness. We are looking forward to young people with rich creativity and spirit to pioneer the scientific technology of tomorrow to enter our university.

A MESSAGE FROM THE DEAN:　Be Creative and Pioneering!

Under the severely competitive conditions of the world, Japanese industries have been requiring the highest level of scientists and engineers to innovate and sustain the highest level of technologies of Japan. Our graduate courses aim to educate the highest level of scientists and engineers who can create leading technologies and cooperate with scientists and engineers all over the world. Since our curricula are based on the latest and most advanced science and technology, students can master most updated and practical knowledges and technologies.

We look forward to welcoming young researchers full of creativity and ambitions for the future.

Graduate School of Humanity-Oriented Science and Engineering
Professor Masayuki FUJII, Dr. of Science

CONTENTS

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Biological and Environmental Chemistry Course

Bioorganic Chemistry Laboratory

Prof. Masayuki Fujii, Doctor of Science

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[Keywords]
Nucleic Acid Therapeutics, Anti-Cancer Drug, Gene Delivery

Research Outline

We are developing artificial molecules which can bind to the specific gene and control its expression, especially, chemically modified and bio-conjugated oligonucleotides, antisense DNA and siRNA. We believe nucleic acid therapeutics will come true from chemical biology based on synthetic organic chemistry and cellular biology.

[1] Nucleic Acid Therapeutics for Mutant KRAS Dependent Cancer

Design and synthesis of chemically modified DNA/RNA and their conjugates with functional molecules which can selectively suppress mutant KRAS oncogene.

[2] Nucleic Acid Therapeutics for Mutant EGFR Dependent Cancer

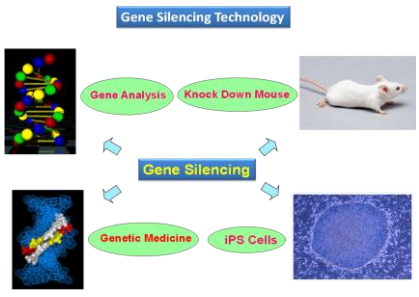
Design and synthesis of chemically modified DNA/RNA and their conjugates with functional molecules which can selectively suppress mutant EGFR(T790M) gene.

[3] Non-Toxic Transfection of siRNA into Cells

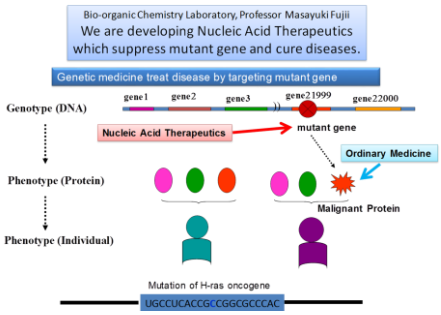
Non-Toxic siRNA transfection into cells and specific gene silencing using designed peptides.

[4] Synthesis of Multiple DNA/RNA-Bioconjugates

Chemo-Enzymatic approach to multiple DNA/RNA-conjugates.



Gene Silencing



Nucleic Acid Therapeutics

Latest publication and activity

[Book]

1) Non-Toxic Transfection of siRNA into Cells by Novel Peptides, M. Fujii, Synthesis and Application of Nucleic Acid Therapeutics, Part III DDS, Chapter 6, 210-217 (**2016**) Ed by Takeshi Wada, CMC Publishers Inc.
2) Transfection Technology of siRNA, M. Fujii, Chapter 6. Protocols and Practical Resolutions for Gene Transfection and Gene Manipulation, Advanced Technologies of Development of Novel Therapeutics and Diagnostic Pharmaceuticals, Section 3, 262-267 (**2014**), Technical Information Institute Co. Ltd.

[Published Paper]

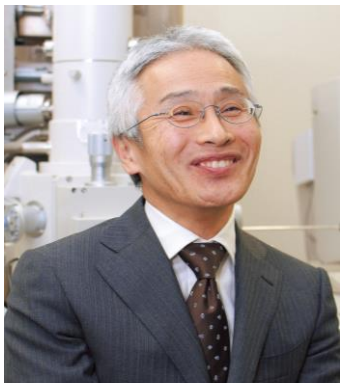
1) Silencing of BCR/ABL Chimeric Gene in Human Chronic Myelogenous Leukemia Cell Line K562 by siRNA-Nuclear Export Signal Peptide Conjugates. M. Fujii *et al.*, *Nucleic Acid Therapeutics*, June **2017**, Vol. 27, No. 3: 168-175.
2) Delivery of therapeutic RNA-cleaving oligodeoxyribonucleotides (deoxyribozymes): from cell culture studies to clinical trials M. Fujii *et al.Expert Opin. Drug Delivery*, **2016,** 13, 1-13.

[Patent]

1. Method for transfecting nucleic acid to cell and nucleic acid complex. Japanese Patent 5738862, US Patent 9,057,067. European Patent No. 2594638.

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Biological and Environmental Chemistry Course



Analytical Chemistry Laboratory

Prof. Hirofumi Kawazumi, Doctor of Engineering (Kyushu University)

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[Keywords]
Laser Spectroscopy, Mechanical recycling of Plastics, μ-TAS (micro total analytical system), Chemometrics

Research Outline

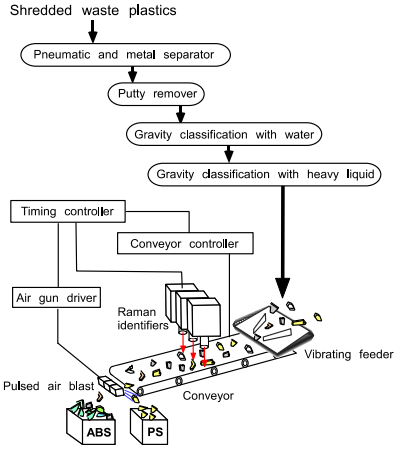
Environmental and biological issues include complicated phenomena and require state of art technology to elucidate the mechanisms. We are developing the new and versatile analytical techniques based on laser spectroscopy for solving these problems.

[1]. Laser spectroscopy

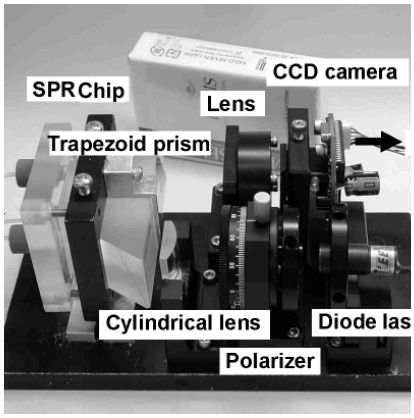
Ultra sensitive and selective methods using laser-induced fluorescence and multi-photon ionization are used for monitoring molecular behavior at surface and interface where the important substance transport occurs. Techniques developed in these studies are applied for new apparatus development such as an endocrine disrupter detector and a compact DNA sequencer.

[2]. Mechanical recycling of Plastics

Raman Spectroscopy is able to identify plastic components, similar to infrared absorption. We developed a high-speed Raman apparatus of a less 1.5-millisecond cycle, and a precise analyzing methodology. This technique is successfully implemented into the online sorting in a shredded plastic recycling plant.



Massive plastic sorting system based Raman spectroscopy



Compact SPR immunosensor

Latest publication and activity

[Book]

1) ”Progress in Sustainable Energy Technologies Vol II, Creating Sustainable Development”, Chapter 34, “High-Performance Recycling System for Waste Plastics Using Raman Identification”, ISBN 978-3-319-07977-6, Springer (SPi Global), 2014.

[Published Paper]

1) “Synthesis of Pt–Ag alloy triangular nanoframes by galvanic replacement reactions followed by saturated NaCl treatment in an aqueous solution” M. Tsujia, M. Hamasaki, A. Yajima, M. Hattori, T. Tsuji, H. Kawazumi, Materials Letters, 121, 113–117 (2014).

2) “Label-free biosensor using polyion-modified gold nanorods adsorbed on a glass substrate” H. Kanako, H. Kawazumi, N. Nakashima, Y. Niidome, Chemistry Letters 39(9), 992-993 (2010).

[Patent]

1) Japanese Patent No. 3854986
2) Japanese Patent No. 4203916
3) Japanese Patent No. 4260205

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Biological and Environmental Chemistry Course

Microbial Technology Laboratory

Prof. Kenji TANAKA, Ph.D (Agricultural Science)

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[Keywords]
Green plastics, CO_2 fixation, Microbial control, Rotifer

Research Outline

Our research and development is focused on the industrial application of microorganisms to food, health, drug, chemicals, agriculture, and environmental protection, especially bioconversion of CO_2 and biomass to useful substances using bacteria.

[1]. Microbial production of *Green Plastics* from CO_2

We have studied biodegradable plastics, polyhydroxyalkanotaes, PHAs from CO_2 using hydrogen-oxidizing bacteria, especially for high cell density culture system using $H_2/O_2/CO_2$ gas mixture, isolation of CO tolerant strain, genetic engineering for production of new type *co*-PHAs.

[2]. Microbial production of *Green Plastics* from xylose, a component sugar of hemicellulosic biomass

[3]. Acid tolerance lactic acid bacteria isolated from vinegar and its industrial application

[4]. Antimicrobial effect of novel visible light responsible photo catalyst on pathogenic bacteria, fungi, and virus

[5]. Development of high density culture system for mass production of marine zooplankton, rotifer as initial live food for larva and juvenile fishes in aquaculture and mariculture

Fig.1 Accumulated PHA in the cell of CO tolerant *Ideonella* sp. Onga isolated in our labolatory

Fig.2 The size of culture tank was minimized to 1/100 in our high density culture system (right) from the classical culture system (left) to produce the same amount of rotifer

Latest publication and activity

[Published Paper]

1) "Autotrophic Growth of *Paracoccus denitrificans* in aerobic condition and the accumulation of biodegradable plastics from CO_2". K.Tanaka, S.Mori, M.Hirata, H.Matsusaki.. *Environment and Ecology Research*, 4(4): 231-236, 2016

2) "Biosynthesis of poly (3-hydroxybutyrate-*co*-3-hydroxyalkanoates) by recombinant *Escherichia coli* from glucose". A.Hokamura, I.Wakida, Y.Miyahara, T.Tsuge, H.Shiratsuchi, K.Tanaka, H.Matsuzaki. *J.Biosci.Bioeng.*, 120(3), 305-310, 2015

3) "Microbial production of poly (hydroxybutyrate) from C1 carbon sources. KD.Kianoush, ZB.Mokhtari, T.Amai, K.Tanaka. *Appl.Microbiol.Biotechnol* 97(4), 1407-1424, 2013

4) "YB1 binds to and represses the p16 tumor suppressor gene." Y.Kotake, Y.Ozawa, M. Harada, K.Kitagawa, H.Niida, M.Fujii, Y. Morita, K.Tanaka, T.Nishida, T.Suda, M. Kitagawa. *Genes to Cells*, 18(11), 999–1006, 2013

5) "High density culture of marine zooplankton, *Brachionus plicatilis* as initial food organism for aquaculture. K.Tanaka, H.Takahashi, Y.Hamasaki, T.Yoshimatsu. C*urrent Topics in Biotechnol*., Vol, 4, 41-46. 2008

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Biological and Environmental Chemistry Course

Biopolymer Laboratory

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[Keywords]
Polysaccharide, Hydrogel, Heavy Metal, Green-Tide, Ulva

Research Outline

Identifying the biological and chemical functions of the material derived from green tide-forming chlorophyta is a possible way to achieve strategic goal B of "The Aichi Biodiversity Targets." This goal is specifically designed to "reduce the direct pressures on biodiversity and promote sustainable use."

[1]. Chemical Modification of Polysaccharide Derived from Green-Tide Forming Chlorophyta

The sulfated polysaccharide ulvan is an interesting compound for biomaterials, because many biological activities have been reported including antioxidative, anti-hypercholesterolemic, immunostimulating, and turbot phagocytes stimulation among others. We focused on ulvan for the utilization of the green tide-forming chlorophyta *Ulva*. We utilized chemically modified ulvan to generate urethane foam and demonstrated its utility in the removal of Cu^{2+} ions from an aqueous solution.

[2]. Environmental Education

To teach youths the importance of environment and encourage them to consider the sustainable use of ecosystem services, we ran experiments on how to efficiently use *Ulva*, an alga that has overgrown and results in green tide around the world.

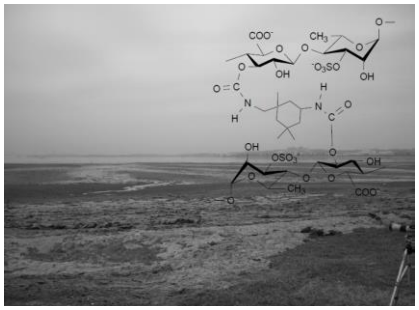

Fig.1 Green Tide

Fig.2 CBD-COP10

Latest publication and activity

[Published Paper]

1) "Urethane Foam of Sulfated Polysaccharide Ulvan Derived from Green-Tide Forming Chlorophyta: Synthesis and Application in the Removal of Heavy Metal ions from Aqueous Solutions", Kenichi Kanno, Yoshihiro Fujita, Satoshi Honda, So Takahashi and Satoshi Kato, Polymer Journal, 46, 813–818 (2014)

2) "Adsorbents for Apheresis Prepared from Polysaccharides of Algae that Threaten Ecosystem Services", Kenichi Kanno, Tetsuya Tanigawa, Yoshihiro Fujita, Naoto Ohnaka, Yuichiro Kubo, Kaito Yoshida, Kota Kojima, Koshiro Nakata, Masafumi Shimohara, Chemistry & Biodiversity, 11, 1140-1150 (2014)

3) "Chemical Experiment for Utilizing Algae-Knowing Polysaccharide Structure, Chemical Treatment of Water, and Presenting the Results –", Kenichi Kanno and Testuo Kaneko, Environmental Education, Vol.24, No.2, 71-76 (2014)

Graduate School of Humanity-Oriented Science and Engineering, Kinki University

Biological and Environmental Chemistry Course

Laboratory of Environmental Biochemistry

Prof. Yasutaka MORITA, Ph. D.

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[Keywords]
Biotechnology, Enzyme Engineering, Peptide Engineering, Biosensor, Combinatorial Bioengineering

Research Outline

Living organisms and cells in extreme environments (high or low temperature, high or low pH, high salinity, and high pressure etc.) have adapted to their habitats in such a way that metabolic processes permit them to survive and function. Our research group focus on the screening, characterization, development and application of these useful and functional biomaterials for industrial application.

[1]. Screening and characterization of novel and useful biomaterial

The microorganisms which produce novel biological materials (enzyme, pigment, lipid, and nucleic acid etc.) were isolated and characterized. These studies include to elucidate the relationship between structure and function of biological materials using genetic engineering.

[2]. Development and application of functional peptide

The present study aim at the characterization, the binding mechanisms with the target, and the application to a biosensor and biodevice of peptide ligands which has high affinity to small molecules such as dioxin, endocrine disrupting chemicals and fullerene, or various living cells.

Latest publication and activity

[Published Paper]

1) T. Sakaguchi, T. Nakano, Y. Kimura, S. Nogami, I. Kubo, Y. Morita, Development of a genetic transfer system in selenate-respring bacterium, Citrobacter sp. strain JSA wihch was isolated from a freshwater natural sediment. *J. Biosci. Bioeng.*, **111**, 443-447 (2011)

2) I. Helianti, T. Ohkubo, Y. Morita, E. Tamiya, Characterization of thermostable native alkaline phosphatase from an aerobic hyperthermophilic archaeon, Aeropyrum pernix K1, *Appl. Microbiol. Biotechnol.,* **74**, 107-112 (2007)

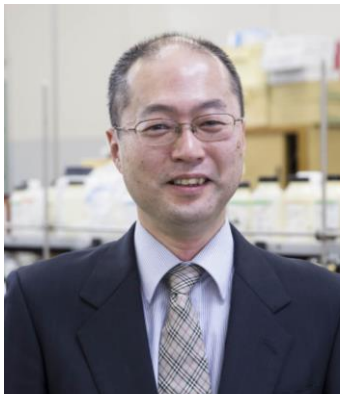
3) Y. Morita, K. Mamiya, S. Yamamura, E. Tamiya, Selection and properties for the recognition of P19 embryonic carcinoma stem cells, *Biotech. Progress*, **22**, 974-978 (2006)

4) Y. Morita, T. Ohsugi, Y. Iwasa, E. Tamiya, A screening of phage displayed peptides for the recognition of fullerene (C60), *J. Mol. Catalysis B: Enzymatic*, **28**, 185-190 (2004)

5) S. Yamamura, Y. Morita, Q. Hasan, K. Yokoyama, E. Tamiya, Keratin degradation: a cooperative action of two enzymes from *Stenotrophomonas sp.*, *Biochem. Biophys. Reser. Comm.*, **294**, 1138-1143 (2002)

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Biological and Environmental Chemistry Course



Functional Polymer Chemistry Laboratory

Associate Prof. Kozo Matsumoto, Doctor of Engineering

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[Keywords]
Polymer synthesis, Functional polymer, Organic synthesis

Research Outline

We study on synthesis and property of novel functional polymers which can be applicable to ion-conductive materials, adhesives, and environmentally benign or biocompatible materials.

[1]. Synthesis and Property of Ion-Conductive Materials

Research about development of safe and reliable ion-conductive polymers which is inevitable to batteries, fuel cells, solar cells, sensors

[2]. Synthesis and Property of Networked Polymers

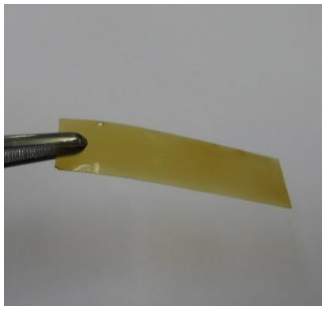
Research about networked polymers which exhibit high performance on thermal stability, high mechanical strength, adhesive properties, and gel-forming ability

[3]. Synthesis and Property of Biocompatible Polymers

Research about bio-related polymers such as γ-poly(glutamic acid) and sugar-based materials, which can be useful in biomedical applications

[4]. Polymer Synthesis Using CO_2 as Key Resources

Research about process converting CO_2 to valuable and useful materials such as adhesive, sealants, coatings, paints.



Novel hydroxide ion-conductive membrane (left), and pilot plant to synthesize functional polymers utilizing waste CO_2 gas (right)

Latest publication and activity

[Published Paper]

1) A. Karimata, K. Matsumoto, and T. Endo, “Synthesis and thermal properties of polyesters bearing a carbosilane repeating unit”, *Polym. Bull.*, **74** (6), 2391-2399 (2017).
2) K. Matsumoto, M. Kakehashi, H. Ouchi, M. Yuasa, and T. Endo, "Synthesis and Properties of Polycarbosilanes Having 5-Membered Cyclic Carbonate Groups as Solid Polymer Electrolytes", *Macromolecules*, **49** (24), 9441-9448 (2016).
3) K. Matsumoto, A. Kokai, and T. Endo, “Synthesis and Properties of Novel Poly(hydroxyurethane) from Difunctional Alicyclic Carbonate and *m*-Xylylenediamine and its Possibility as Gas-Barrier Materials”, *Polym. Bull.*, **73** (3), 677-686 (2016).

[Patent and so on]

1) T. Endo, K. Matsumoto, K. Tamaso, C. Asakura, R. Ogawa, “ Epoxy resin composition containing phosphorus-containing flame retardant, a prepreg, and an epoxy resin laminated plate”, WO2016/152839 A1.

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Biological and Environmental Chemistry Course

Cell Biological Technology Laboratory

Associate Prof. Yojiro KOTAKE, Ph.D.

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[Keywords]
Animal Cells, Cell Cycle, Cancer, Noncoding RNA

Research Outline

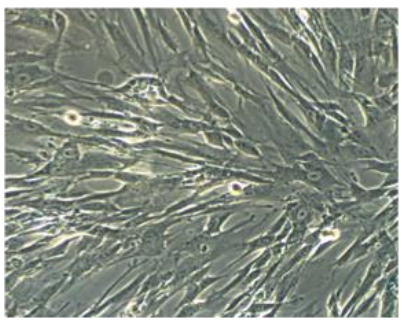
Our laboratory studies the mechanisms of cellular senescence and cancer development by combining genetic, cellular and biochemical approaches.

[1]. The regulation of cell cycle

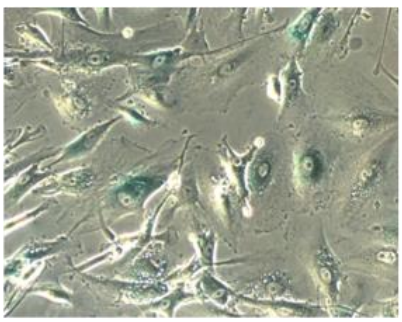
Cell cycle-related genes contribute to various types of cell fate determination including cellular senescence and cancer development. Our current research in this area is focused on two issues: (1) Determining the regulation of cyclins, CDKs and CDK inhibitors, (2) Determining how DNA damage and oncogenic signal deregulate cell cycle, leading to cellular senescence and cancer development.

[2]. Search for functional long noncoding RNAs

Recent mass scale transcriptome analysis has revealed the existence of large numbers of long noncoding RNAs (lncRNAs) in mammals. However, the function of most lncRNAs remains unclear. Our current research in this area is focused on two issues: (1) Searching for novel lncRNAs involved in cellular senescence and cancer development, and (2) Developing the inhibition method of cancer-related lncRNAs.



Young cells



Senescent cells

Latest publication and activity

[Selected Paper]

1) M. Harada, Y Kotake et al: YB-1 promotes transcription of cyclin D1 in human non-small-cell lung cancers. *Genes Cells*, 19: 504-516, 2014.

2) Y. Kotake et al: YB1 binds to and represses the p16 tumor suppressor gene. *Genes Cells*, 18: 999-1006, 2013.

3) N. Liu et al: Chk1 phosphorylates the tumor suppressor Mig-6, regulating the activation of EGF signaling. *EMBO Journal*, 31:2365-2377, 2012.

4) Y. Kotake et al: Long non-coding RNA ANRIL is required for the PRC2 recruitment to and silencing of $p15^{INK4B}$ tumor suppressor gene. *Oncogene*, 30: 1956-1962, 2011.

5) T. Hung et al: Extensive and coordinated transcription of noncoding RNAs within cell-cycle promoters. *Nature Genetics*, 43:621-629, 2011.

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Biological and Environmental Chemistry Course

Laboratory of Food Function

Associate Prof. Koichiro OHNUKI, Ph. D. (Agriculture)

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[Keywords]
functional food, mental disorder, obesity, metabolic syndrome

Research Outline

Our research group, including the researchers in Kyushu University and Kyushu Nutrition Welfare University, established the comprehensive research system for evaluating food function from gene, cell, and animal to human.

[1]. *In vitro* screening

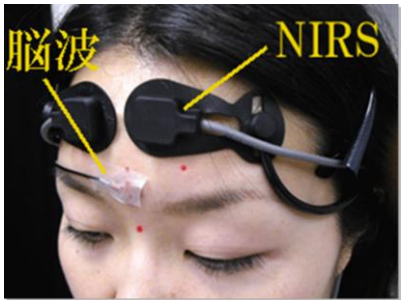
For estimating and/or characterizing the function of foods, we demonstrate the effects of foods by evaluating lipase and glucosidase inhibition, anti- fungi, anti-virus, anti-cancer, and anti-oxidant activity.

[2]. Animal experiment

We established the comprehensive screening system for evaluating the effects of food in mice by analyzing the blood, tissues, behaviors, X-ray computed tomography.

[3]. Human clinical trial

We evaluate the effects of food comprehensively in human by using randomized clinical trial and physiological experiments. We also use psychological methods for screening the effects of food in mental function.



Electroencephalogram analysis

Evaluation of animal behavior

[Published Paper]

1) Effect of dietary fat type on anxiety-like and depression-like behavior in mice. Springerplus. 2013.
2) Target proteins of ganoderic acid DM provides clues to various pharmacological mechanisms. Sci Rep. 2012.
3) Studies on the metabolism and toxicology of emerging capsinoids. Expert Opin Drug Metab Toxicol. 2011.
4) Reduction of depression and anxiety by 4 weeks Hericium erinaceus intake. Biomed. Res. 2010.
5) Enhanced adult neurogenesis and angiogenesis and altered affective behaviors in mice overexpressing vascular endothelial growth factor 120. J Neurosci. 2008.

[Award]

Award for Excellence in Biosci Biotechnol Biochem. 2001.

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Biological and Environmental Chemistry Course

Environmental Materials Science Laboratory

Associate Prof. Nobuto OKA, Ph. D. (Engineering)

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[Keywords]
Conductive Ceramics, Photocatalysts, Water Decontamination, Rechargeable Batteries, Solar Cells, Computational Materials Design

Research Outline

We develop the novel functional materials for decreasing the energy usage and environmental load on the basis of "chemistry" and "computer science". We focus on the ceramics (e.g. glass and pottery) and polymer gels, which are familiar materials to our life, and design novel functionalities for these materials.

[1]. Highly Conductive Ceramics

In general, ceramics cannot carry electricity. However, the highly conductive ceramics, and even the transparent metal (transparent conductive oxide) can be designed using the knowledge of physics and chemistry. We develop the new functional materials, which is the technology indispensable for advanced devices (e.g. metal-air rechargeable battery and solar cell).

[2]. Visible-light-active Photocatalysts

Photocatalysts are expected as the environment purification materials since they can decompose organic materials under the light irradiation. We develop high performance photocatalysts, e.g. visible-light active thin film WO_3 loaded with Pt nanoparticles, which has quite excellent photocatalytic ability (Fig. 1).

[3]. Computational Materials Design

To expedite the materials development, we design novel functional materials using computer.

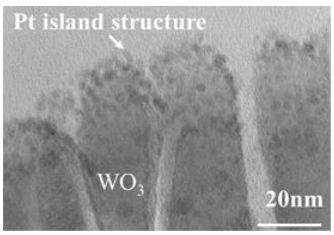

Figure 1. Pt-loaded WO_3 films have an excellent photocatalytic ability under visible light irradiation.

Figure 2. "The 1st annual JMR Paper of the Year Award" (2015) from Material Research Society (USA).

Latest publication and activity

[Published Papers]

1) (Photocatalysts: Invited) "Visible-light active thin-film $W0_3$ photocatalyst with controlled high-rate deposition by low-damage reactive-gas-flow sputtering", APL Materials 3 (2015).
2) (Transparent Conductive Films: Invited) "Thermophysical Properties of $Sn0_2$-based Transparent Conductive Films: Effect of Dopant Species and Structures, Compared with $1n_20_3$-, ZnO-, $Ti0_2$-based Films", J. Mater. Res. 29 (2014).
3) (Solar Cells) "Controllable bandgap of $Cu_2ZnSn(S,Se)_4$ thin films via simultaneous supercritical fluid chalcogenization", Appl. Phys. Express 8 (2015).
4) (Electrochromic Materials) "Electrochromic properties of nickel oxide based thin films sputter deposited in the presence of water vapor", Thin Solid Films 520 (2012) 3839-3842.
5) (Material Database) "Material database syndication with RSS", Data Science Journal 6 (2007).

[Awards]

1) Materials Research Society (USA): "the 1st annual JMR Paper of the Year Award" (2015).
2) Japan Society of Thermophysical Properties : Young Researcher Award of the JSTP (2012).
3) (Postgraduate student of this laboratory) Best Poster Award (silver): "The 10th International Symposium on Transparent Oxide and Related Materials for

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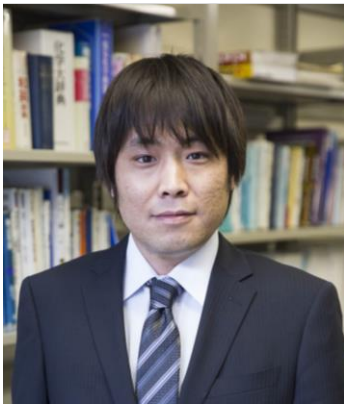
Biological and Environmental Chemistry Course



Functional inorganic materials engineering Laboratory

Lecturer, Masayoshi YUASA, Ph.D

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[Keywords]
Battery, Chemical Sensor, Metal oxide, Electrochemistry

Research Outline

Functional inorganic materials engineering laboratory aims to develop electrochemical devices by controlling the composition, size and shape of inorganic materials. In particular, we focus on metal-air batteries with very high energy density and chemical sensors.

[1]. Metal-air battery

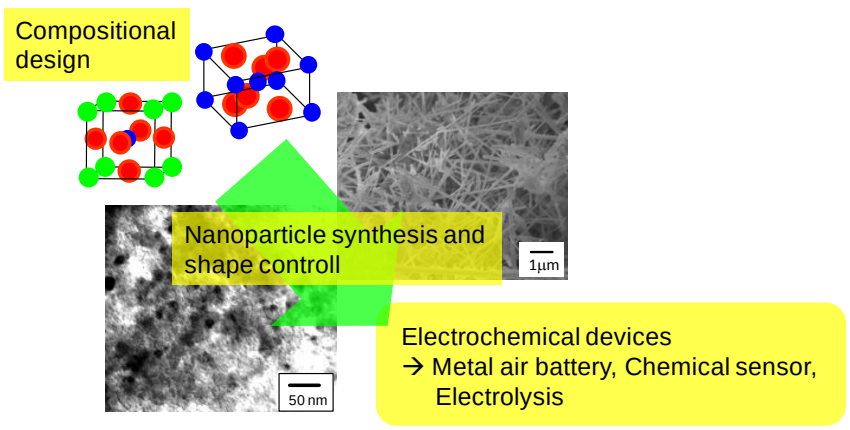
Metal-air battery has the highest theoretical energy densities in chemical batteries because they utilize oxygen in atmospheric air as a cathode. Therefore, metal air battery is paid attention as one of the candidates for new power sources of electric vehicles. Our laboratory develops high performance electrode materials and electrolyte for metal-air batteries.

[2]. Chemical Sensor

Our laboratory investigates non-enzymatic type glucose sensors and gas detection sensors on the basis of size and shape control of metal oxide particles.

[3]. Fine-particle synthesis

Our laboratory investigates new synthesis methods for producing size-controlled and high surface area nanoparticles.



Latest publication and activity

[Published Paper]

1) "Oxygen reduction activity of carbon- supported $La_{1-x}Ca_xMn_{1-y}Fe_yO_3$ Nanoparticles", Chemistry of Materials, 25, 3072-3079 (2013).

2) "Preparation of a stable sol suspension of Pd-loaded SnO_2 nanocrystals by a photochemical deposition method for highly sensitive semiconductor gas sensors", ACS Applied Materials & Interfaces, 4, 4231–4236 (2012).

3) "Bi-Functional Oxygen Electrodes Using $LaMnO_3$/$LaNiO_3$ for Rechargeable Metal-Air Batteries", Journal of the Electrochemical society,158, A605-A610 (2011).

4) "Preparation of carbon-supported nano-sized $LaMnO_3$ using reversemicelle method for energy-saving oxygen reduction cathode", Catalysis Today, 126, 313-319 (2007).

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Electronics and Computer Science Course

Image Processing Laboratory

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[Keywords]
GIS, Image Processing, Hazard, DEM, Disaster

Research Outline

I work on the subject of "Natural Disaster by GIS analysis". Disasters such as floods in the typhoon season cause severe damage in Japan every year. Several tools to analyze floods are developed based on a new Digital Elevation Model by GIS. Also, applications of X-band MP radar as a next generation radar are developed.

[1]. Application of X-band MP radar

X-band MP radar is a new radar system with high resolution X-band sensor, which can detect rainfall. The resolution is much higher compared with C-band radar. MLIT of Japan started operation of an X-band MP radar system in 2012. The accumulated rainfall amount monitoring system is developed in our laboratory. Previously, there was no rainfall amount monitoring system that could help develop GIS by integrating with the rainfall data by X-band MP radar.

[2]. Application of a new Digital Elevation Model

MLIT of Japan has started to provide a new DEM in 2012, with a spatial resolution of 5 meters and covering almost 70% of the land of Japan, which is highly accurate. We can precisely estimate flood area by GIS based on the new DEM. The new DEM is quite effective in constructing a 3D model.

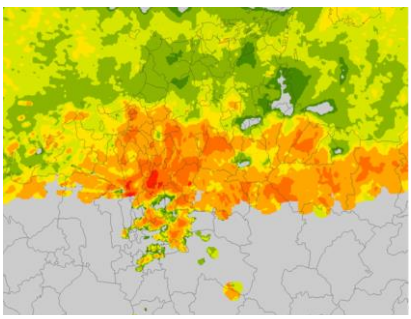

Fig.1 Rainfall amount

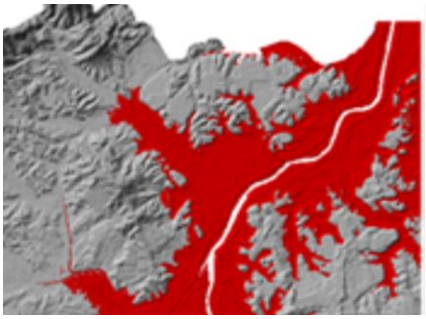

Fig.2 Estimated flood area

[Published Paper]

1) "The Web-based accumulated rainfall amount monitoring system by X-band MP radar," M. Nishio, M. Mori, Journal of Flood Risk Management, (2015) to be published.
2) "The construction of flood monitoring system with alert distribution using Google Earth and 3D GIS," YiLi Chan, M. Mori, Journal of Disaster Research, Vol.8, No.3, pp.512-518(2013)
3) "WEB-Based Delivery System for Disaster Prevention Information using a New JMA DPI XML Format and AMEDAS Data," M. Nishio, M. Mori, ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Vol.1-4, pp.23-27(2012)
4) "Application of Google Earth for flood disaster monitoring in 3D-GIS," M. Mori, YiLi Chan, Disaster Management and Human Health Risk, Vol.II, pp.271-276(2011)
5) "GIS analysis of flood damage using Google Earth," M. Mori, River Basin Management, Vol.5, pp.263-270(2009).

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Electronics and Computer Science Course

Bioelectronics Laboratory

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[Keywords]
Biosensor, Self-organization, Bioengineering, Lipid membrane

Research Outline

Bioelectronics is the field of the electronics which reproduces the feature of living things artificially. The reproduction of the human senses is aimed at through development of a taste sensor and various sensors. A study of a biological measurement is also advanced to develop the sensor which reproduces the human senses.

[1]. Taste sensor with lipid-polymer membranes

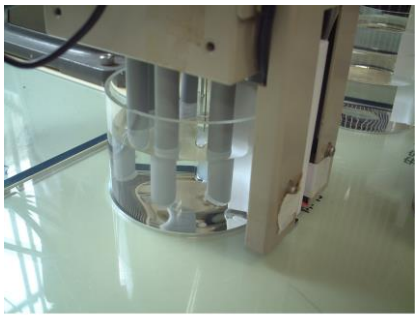
A taste sensor quantifies the taste of the food. The taste sensor has eight channel of lipid-polymer membrane. Membrane potentials of the lipid-polymer membranes change by the interaction with the lipoid membrane and the taste substance in the food.

[2]. Data analysis of multichannel taste sensor

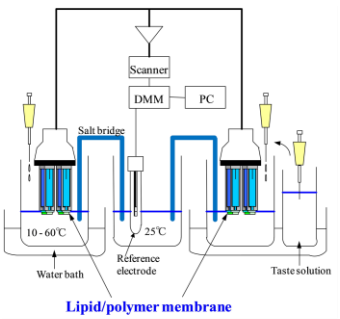
There are five kinds of basic taste such as salty. Each channel of a taste sensor responses by the sensitivity beyond human to the basic taste. It is aimed at to convert output signals of a taste sensor to information on the various tastes.

[3]. Monitoring of electric potential and movement from cultivated plant

Plant factory is drawing attention in recent years. In the factories, plants are cultivated under artificially environment such as light condition. Electric potential and movement of a plant are measured to monitor the grown-up activity.



Taste sensor



Measurement systems

Latest publication and activity

[Book]

1) “What is the self-organization?” K.Toko, S.Ezaki, T.Ueda and M.Nishizwa, Kodanshsa Blue Bucks (2009) [in Japanese]

[Published Paper]

1) “Monitoring system on residential septic tank using sensors”, S.ezaki and H.Li, Proceedings of 20th ICEE, pp.1699-1702 (2014)
2) “Sensitivity-improvement of tasta sensor by change of lipid concentration in membrane”, S.Iiyama, S.Ezaki and K.Tokol, Sensor and Actuators B, vol.141, pp343-348 (2009)
3) “Temperature dependence of bitter taste and output characteristics of taste sensor”, Sensors and Materials, vol.20, pp.161-169 (2008)

Electronics and Computer Science Course

Mathematical Sciences Laboratory

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[Keywords]
Analytic Number Theory, Special Functions, Mathematical Physics

Research Outline

Mathematics, particularly analytic number theory, special functions and their applications to physics and chemistry

[1]. General Modular Relations

A systematic and unified treatment of many known equations derived from a functional equation between two Dirichlet series, as modular relations through the use of Fox H-functions and Meyer G-functions. These include Bochner's formula, Riesz sums, K-Bessel expansions, incomplete gamma expansions, Hurwitz's formula, Oppenheim's formula, Wilton's formula, in the case of Riemann zeta function. A thorough explanation is presented in "Contributions to the Theory of Zeta-Functions:The Modular Relation Supremacy."

[2]. Zeta Functions

Applications of zeta-functions to physics and chemistry , for example, zeta-regularized products which allow assignments of finite limits to originally divergent infinite products. Refer to "Vistas of Special Functions" and "Vistas of Special Functions II," and "Crystal Symmetry Viewed as Zeta Symmetry."

[3]. Miscellaneous

A study of the axiom of choice and its equivalents, Zorn's lemma, well-ordering theorem and Tychonoff's theorem, etc. A new and simplified proof of Tychonoff's theorem is given in "Tychonoff's Theorem as a Direct Application of Zorn's Lemma."

Latest publications and activities

[Books]

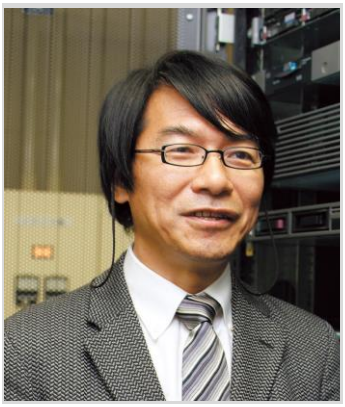
1) "Contributions to the Theory of Zeta-Functions:The Modular Relation Supremacy," S. Kanemitsu and H. Tsukada, World Scientific, (2015)
2) "Vistas of Special Functions II," K. Chakraborty, S. Kanemitsu and H. Tsukada, World Scientific, (2009)
3) "Vistas of Special Functions," S. Kanemitsu and H. Tsukada, World Scientific, (2007)

[Published Papers]

1) "Tychonoff's Theorem as a Direct Application of Zorn's Lemma," H. Tsukada, Pure and Applied Mathematics Journal. Special Issue:Abridging over Troubled Water --- Scientific Foundation of Engineering Subjects. Vol. 4, No. 2-1, pp. 14-17 (2015)
2) "A General Modular Relation in Analytic Number Theory," H. Tsukada, Proc. 4th China-Japan Seminar on Number Theory 2006, World Scientific pp. 214-236 (2007).
3) "Crystal Symmetry Viewed as Zeta Symmetry," S. Kanemitsu, Y. Tanigawa, H. Tsukada and M. Yoshimoto, Proceedings of Kinki University Symposium "Zeta Functions, Topology and Quantum Physics 2003" Developments in Mathematics, Vol. 14, Springer pp. 91-129 (2005)

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Electronics and Computer Science Course



Yamasaki Laboratory

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[Keywords]
Electric money, Virtual Currency, Bitcon, Web privacy

Research Outline

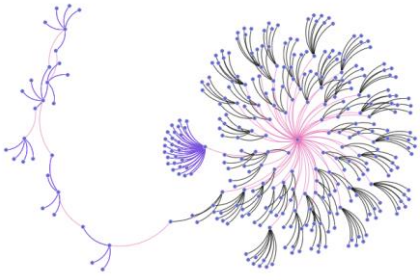
The Block chain technology of Bitcoin is an innovation of electric money. We expect that this block chain technology become an information infrastructure of our society. Our laboratory has some research projects about the block chain technology and virtual currency technologies.

[1]. Virtual currency and its applications

We are developping a new virtual currency system based on "coloed coin sysytem" which adds different meanings of transactons. We have a plan to apply this new virtual currency in a local economy in Kyushu area.

[2]. Web privacy and trust

The web pages are the most inportant infomation source of today. Serch engines like Google or Yahoo! had been succeeded to provide acurate useful wab bapges. Social network has become another important infomation source. The purpose of our research is to develop a SNS based accurate trustable information system that keeps privacy.



Trace of Bitcoins from Mt.Gox

Virtual Currency-Technology Book

Latest publication and activity

[Book]

1) “Virtual Currency-Technology, Low and Institution” Hitosh Okada, Ikuo Takahasshi, Shigeichiro Yamasaki.　Toyo-keizai Shinpo, ISBN-13: 978-4492681381, (2015)
2) "IT Enabled Services:　Chapter5. A Community Based Trust Establishing Mechanism for a Social Web Service", Shigeichiro Yamasaki, Springer-Verlag Wien, ISBN: 978-3-7091-1424-7, (2013)
3) "Infromation Security (IT Text) Chapter 9: Public Key Infrastructure", Shigeichiro Yamasaki, Ohomsha, ISBN:4-274-13284-6, (2003)

[Published Paper]

1) "Innovetions and Issues of Virtual Currency", Shigeichiro Yamasaki, Proceedings of the IEICE Society Conference 2014, AK-2 "Global Society and Bitcoin", (2014)
2) “An Electric Power Balancing Control by Air-Conditioner Controller with AC Power Frequency Sensor over the Social-Web” Shigeichiro Yamasaki, Applications and the Internet (SAINT), 2012, IEEE/IPSJ 11th International Symposium, 51,

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Electronics and Computer Science Course

Information Systems Laboratory

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[Keywords]
IC tag application system, Information System, Artificial intelligence

Research Outline

I study "IC tag application system" using the IC tag which is one of the important key components in the global society and ubiquitous society, and "Exercise support system" that improves information exercise lesson, "Virtual trip system" using robots.

[1]. Research and development of the IC tag application system

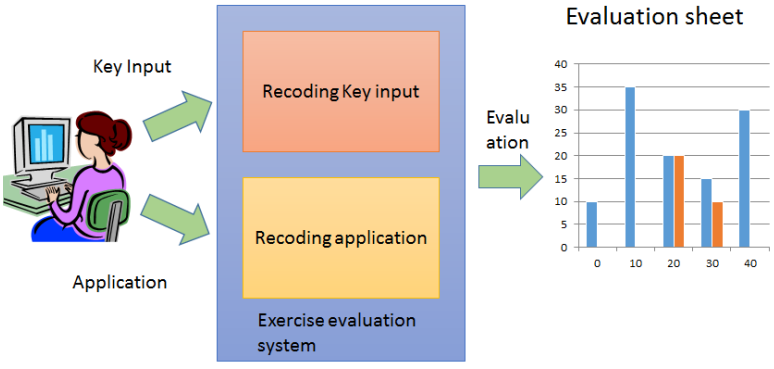
As globalization progresses, the genuine of the products and goods is becoming increasingly important. In this study, we have studied the IC tag application system which ensures the genuine of the products and goods using the IC tag.

[2]. Research and Development of Exercise Support system

In the study of the information engineering, it is important to solve many problems in order to learn the technology. In this research, we are developing the exercises evaluation support system for evaluating the degree of concentration in the information exercise using PC.

[3]. Research of virtual travel system

In this Research, we are studying a system that can experience the virtually travel using robots.



Exercise Evaluation System

Latest publication and activity

[Published Paper]

1) "A Trial for Spatial Reasoning by using Physical Engine," Masaru Ohki et al, The 2013 IEICE General Conference (2013)
2) "Study of the position detection system using the floor marker" Kyousuke Sakaguchi et al, Proceedings of the 2013 National Convention of IPSJ (2013)
3) "Development of Anti-copy Editor for PC Exercises" Kouyou Hikita et al, The 2012 IEEJ General Conference (2012)

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Electronics and Computer Science Course

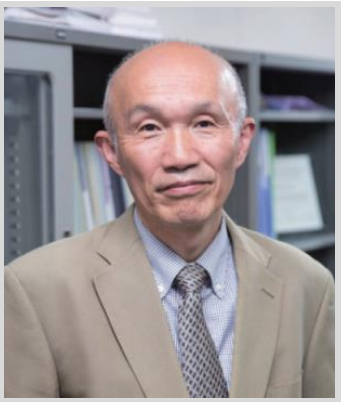


Image-sensing Laboratory

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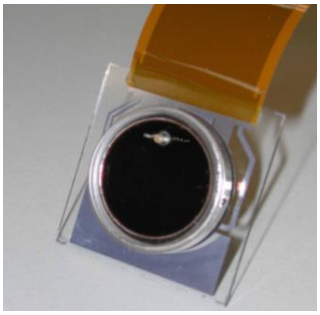
[Keywords]
Image Sensors, Organic Photoconductor, High Sensitivity, Stacked Structure

Research Outline

We have been studying new type of image sensors, with the aim of developing high-sensitivity compact cameras and high-picture-quality compact color cameras.

[1]. High-sensitivity Image Sensor

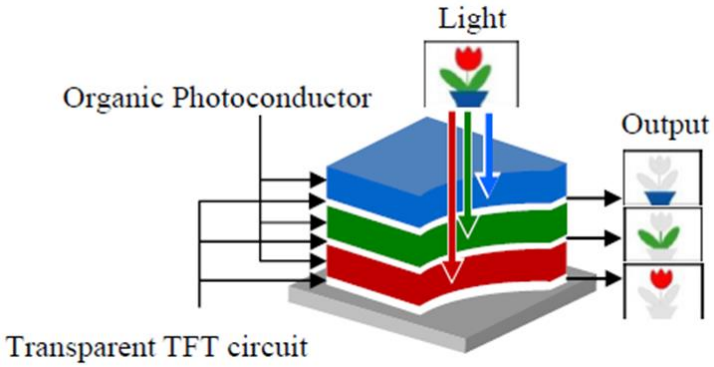
The sensor consisting of a field emitter array and an avalanche photoconductive film, can obtain clear images under dim lighting conditions such as moonlight.



High-sensitivity image sensor

[2]. Color Image Sensor with Organic Photoconductors

The sensor overlaid with three kinds of organic photoconductive films, can obtain color images without color separation optical systems.



Operating principle of color image sensor with organic Photoconductor

[Published Paper]

1) Active-matrix Spindt-type field emitter array with faster response time for image sensor with high-gain avalanche rushing amorphous photoconductor target, Journal of Vacuum Science & Technology B, 33, 1, pp.012205.1-012205.7 (2015).
2) A Compact 120 Frames/sec UHDTV2 Camera with 35mm PL Mount Lens, SMPTE Motion Imaging Journal, 123, 4, pp.21-28 (2014).
3) 120Hz Frame-Rate Super Hi-Vision Capture and Display Devices, SMPTE Motion Imaging Journal, 122, 2, pp. 55-61 (2013).
4) A 33-Megapixel 120-Frames-Per-Second, 2.5-Watt, CMOS Image Sensor With Column-Parallel Two-Stage Cyclic Analog-to-Digital Converters, IEEE Transaction on Electron Devices, 59, 12, pp.3426- 3433 (2012).
5) Doping Effect of Silole Derivative in Coumarin 30 Photoconductive Film, Molecular Crystals and Liquid Crystals, 568, 1, pp.74-81 (2012).
6) A 128 × 96 Pixel, 50 um Pixel Pitch Transparent Readout Circuit Using In-Ga-Zn-O Thin-Film Transistor Array with Indium-Tin Oxide Electrodes for an Organic Image Sensor", Japanese Journal of Applied Physics, 51, 1, pp. 010202.1-010202.3 (2011).
7) Electrostatic Focusing Spindt-type Field Emitter Array for an Image Sensor with a High-gain Avalanche Rushing amorphous Photoconductor Target, Journal of Vacuum Science & Technology B, 29, 4, pp. 04E104.1-04E104.5 (2011).
8) A 128×96 Pixel Stack-Type Color Image Sensor: Stack of Individual Blue-, Green-, and Red-Sensitive Organic Photoconductive Films Integrated with a ZnO Thin Film Transistor Readout Circuit, Japanese Journal of Applied Physics, 50, 2, pp. 024103.1 -024103.6 (2011).
9) Improvement in Photoconductive Properties of Coumarin 30-Evaporated Film by Fullerene Doping for Blue-Sensitive Photoconductors, Japanese Journal of Applied Physics, 49, 11, pp. 111601.1-111601.4 (2010).
10) 2/3 in. ultrahigh-sensitivity image sensor with active-matrix high-efficiency electron emission device, Journal of Vacuum Science & Technology B, 28, 2, pp. C2D11-C2D14 (2010).
11) 640x480 pixel active-matrix Spindt-type field emitter array image sensor with high-gain avalanche rushing amorphous photoconductor target, Journal of Vacuum Science & Technology B, 28, 1, pp. 96-103 (2010).

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Electronics and Computer Science Course

System Engineering Laboratory

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[Keywords] system design, multi-dimensional system, wireless signal/energy transmission, informationization of electric power flows

Research Outline

Our system engineering objectives have three themes, which are “multi-dimensional system”, wireless transmission of signals and energy, and informationization of electric power flows.

[1]. Multi-Dimensional System

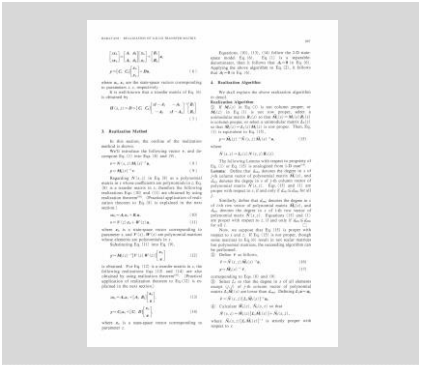
Which is applied to images, moves, 3-D moves, recognition of scenes and so on. We deal Multi-dimensional system theory or multi-dimensional data processing.

[2]. Wireless Transmission of Signals or Energy

We approach both Signals transmission and energy transmission which are different matters by means of a same method wireless transmission.

[3]. Informationization of Electric Power Flows

We investigate smart grid and transformation, storage, or on demand supply of energy in order to work effectively electric power flows.



Multi-Dimensional System

Latest publication and activity

[Published Paper]

1) Reduction Formulae in the Electric Circuit Equations and Their Applications, Reports of Faculty of Humanity-Oriented Science and Engineering, Vol.17, pp.8-16(2012)
2) Blind Carrier Frequency Offset and Channel Estimation Using ICA in QAM-OFDM Systems, Proceedings of IEEE TENCON 2010@Fukuoka, pp.1330-1335(2010)
3) Development of Educational Materials on Energy, Information and Control, Based on Motor Control Technology, Reports of Faculty of Humanity-Oriented Science and Engineering, Vol.13, pp.13-18(2010)
4) A Blind Estimation of Carrier Frequency Offset and Channel in QAM-OFDM, The IEICE Transactions on Fundamentals of Electronics, Communications and Computer Sciences (Japanese Edition), J92A-03, pp.141-149(2009)

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Electronics and Computer Science Course

Electromagnetic Energy Engineering Laboratory

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[Keywords]
Plasma, Ion Beam, Microwave, Thin Film, Computer Simulation

Research Outline

Our research is directed to effective use of the electromagnetic energy in accordance with environment. For example, we develop new plasma and ion beam sources for nanotechnology in a low-carbon society. In addition, we study high-efficient wireless power transfer using high-frequency waves for the next electric power system.

[1]. Ultrafast Deposition of DLC Films by Plasma CVD

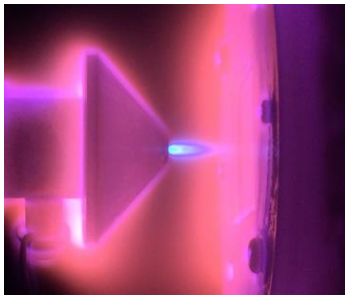
DLC films are widely used in hard coating technology. Recently, the deposition rate has been increasingly required for cost reduction. We develop a new method using plasma CVD with supersonic jet and have succeeded in ultrafast DLC film deposition.

[2]. Effective Production and Control of the Cluster Ion Beam

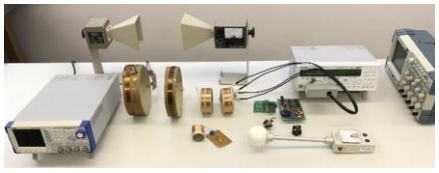
Cluster ion beam has much possibility for large area deposition with a high speed and high quality. Then, control of the cluster growth rate is important because the cluster complexly grows from nano-particles and charged in the plasma. We have mainly investigated the controllability of cluster ion beam by the plasma parameters.

[3]. Optimal Design of Wireless Power Transfer System

Wireless power transfer has attracted much attention as a near-future power feeding system. In our laboratory, the modeling as a design tool has been performed through the comparison between the experiments and electromagnetic field analysis.



DLC deposition by the plasma jet



Equipments of the wireless power transfer

Latest publication and activity

[Published Paper]

1) "Estimation of Negative Ions in VHF SiH_4/H_2 Plasma," T. Yamane, S. Nakano, S. Nakao, Y. Takeuchi, R. Ichiki, H. Muta, K. Uchino, Y. Kawai Japanese Journal of Applied Physics, 53, pp. 116101- 1-4 (2014)

2) "Effect of Gas Flow Rate on the High-Rate. Localized Jet-Deposition of Silicon in SiH_4/H_2 PE-CVD," S. Nishida, H. Muta, S. Kuribayashi, Journal of Chemical Engineering of Japan, 47, pp. 478-482 (2014)

3) "Measurements of SiH_4/H_2 VHF Plasma Parameters with Heated Langmuir Probe, T. Yamane, S. Nakao, Y. Takeuchi, H. Muta, R. Ichiki, K. Uchino, Y. Kawai, Contributions to Plasma Physics, 53, pp. 588-591 (2013)

4) VHF SiH_4/H_2 Plasma Characteristics With Negative Ions, T. Yamane, S. Nakao, Y. Takeuchi, Y. Yamauchi, H. Takatsuka, H. Muta, K. Uchino, Y. Kawai, Surface & Coatings Technology, 228, pp. S433-S436 (2013)

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Electronics and Computer Science Course

Information and Communication Laboratory

Associate Prof. Takayasu KAIDA, Doctor of Engineering

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[Keywords]
Coding Theory, Pseudo-Radom Sequence, Information Security

Research Outline

Research topics are in the field of information theory, especially error correcting codes, sequences and computational complexity. Our research group are investigating them and publishing some results for conferences and journals on domestic and international research communities.

[1]. Pseudo-Random Sequence and its Evaluation

- Constructing method of sequence
- Constant-weight sequence and its property
- Linear complexity and k-error linear complexity
- Non-linear code and sequence from cyclic difference set

[2]. Linear Code and its Evaluation

- Constructing method of linear code and algebraic geometry code(AGC)
- Designed distances for cyclic code and AGC
- Decoding methods for linear codes and AGC
- Codeword and weight distributions of cyclic code
- Non-linear code and its property

[3]. Source Code Readability and Complexity

- Code readability by information amount
- T-complexity and stochastic complexity

Paper Award (APCC2007)

Editorial Activity (IEICE)

Latest publication and activity

[Published Paper]

1) “A note on the rank bounded distance and its algorithms for cyclic codes,” T.Kaida and J.Zheng, Pure and Applied Mathematics Journal, 4(2-1), pp. 36-41 (2015)
2) “On generalized constant-weight codes over GF(q) from a cyclic difference set and their properties,” T.Kaida, J.Zheng and K.Takahashi, Proc. of International Symposium on Information Theory and its Applications, pp. 735-739 (2014)
3) “On constant-weight multi-valued sequences from cyclic difference sets,” T.Kaida and J.Zheng, IEICE Transactions on Fundamentals, E96-A(1), pp. 171-176 (2013)
4) “A decoding method up to the Hartmann-Tzeng bound using the DFT for cyclic codes,” T.Kaida and J.Zheng, Proc. of IEEE 2007 Asia-Pacific Conference on Communications, pp.747-749, (2007) -Best Paper Award-
5) “A typical profile of the *k*-error linear complexity for balanced binary sequences with period 2^n,” T.Kaida, IEICE Transactions on Fundamentals, E88-A(1), pp. 311-313 (2005)

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Electronics and Computer Science Course

Intelligent Information System Laboratory

Assoc. prof. Hiroshi SHIRATSUCHI, Dr. of Information Engineering

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[Keywords]
Neural networks, Open Source Software, Wireless Communication

Research Outline

We are conducting research on the internal structure analysis of neural networks based on a fusion of information theoretical point of view and the geometric point of view. In Addition, we are researching on the software development using open source technology and wireless communication systems.

[1]. Neural Networks

From analyzing of the internal structure of the neural network (N.N) which modeling the brain functions, we aim to improve performance in region such as “recognition” and “association”. Furthermore, we have developed structural learning algorithms to facilitate the analysis of the internal structure of N.N.

[2]. Development Open Source Software

It is a research and development of the system with an emulation environment by utilizing the integrated management and the virtual network a variety of open source.

[3]. Wireless Communication System

For high-speed communications in a wireless communication system, simultaneous transmitting and receiving in parallel by multiple antennas. We have a research and development for the communication method of separating the correctly received signal from the signal such complex radio interference is present.

Latest publication and activity

[Published Paper]

1) “Blind Channel Estimation for QAM-OFDM without Phase Ambiguity,” N. Iwasaki et.al, ICIC Express Letters, Vol. 6, 3, 627-635(2015).
2) “Studies on real time DOA estimation based on DUET,” ICIC Express Letters, Vol. 5, 2, 337-386 (2014).
3) “Blind Channel Estimation for QAM-OFDM Systems,” N. Tanaka et.al, Journal of Signal Processing, Vol. 18, 2, 77-88(2014).
4) “SN ratio estimation and speech segment detection of extracted signals through Independent Component Analysis,” T. Koya et.al, JACIII, Vol. 14, 4, 364-374 (2010).
5) “Blind Carrier Frequency Offset and Channel Estimation Using ICA in QAM-OFDM Systems,” H. Shiratsuchi et.al, Proc. of IEEE TENCON 2010, 1330-1336 (2010)

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Electronics and Computer Science Course

High Voltage Pulse Power Laboratory

Associate Prof. Tsuyoshi Kiyan, Doctor of Sci. and Eng.

e-mail kiyan@fuk.kindai.ac.jp

[Keywords]
Pulsed Power, Discharge Plasma, High Voltage, Reaction Process

Research Outline

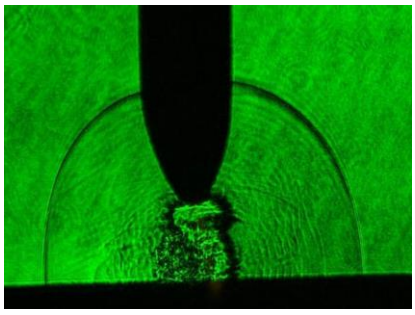
Researches on pulse power technology for generating discharge plasma in the range of several tens to several hundreds of nanoseconds, and its application study are researching in order to apply to an environmental purification, reaction process and material synthesis.

[1]. Research of high functionality pulse power source

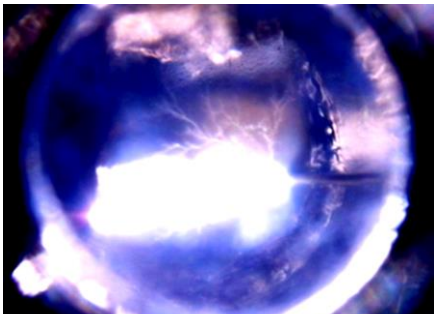
Aiming at industrial application of pulse power technology, which generates the high voltage and large electric power with several hundred nanoseconds time scale, the investigations of a high voltage pulse power supply capable to generation and control of electric discharge plasma are advanced.

[2]. Application to Environmental purification technology and materials synthesis of discharge plasma

Environmental cleanup and improvement related to polluted water, sterilization and agricultural products are conducted by the applied research of discharge plasma with a pulse power technology. And processes of new materials synthesis by fusion of a supercritical fluid with discharge plasma are researched.



Visualization of shock wave by a Schlieren method in SCN_2 (4 MPa)



Arc discharge in supercritical CO_2 (P = 10.1 MPa, V_b = 80 kV)

Latest publication and activity

[Published Paper]

1) T. Ishikawa, et al., A Capacitor Charger with Two Switches for Pulsed Power, IEEJ Trans. on Fundamentals and Materials, Vol.137, No.9, pp. 549-550, (2017), in Japanese.
2) Z.B. Yang, et al., Post-breakdown dielectric recovery characteristics of high-pressure liquid CO_2 including supercritical phase. IEEE Trans. on Dielectrics and Electrical Insulation, 21 (3) pp. 1089-1094, (2014)
3) T. Ihara et al., Initiation mechanism of a positive streamer in pressurized carbon dioxide up to liquid and supercritical phases with nanosecond pulsed voltages, J. Phys. D: Appl. Phys. 45 (2012) 075204
4) T. Furusato et al., Fractal analysis of positive pulsed streamer patterns in supercritical carbon dioxide, IEEE Trans. on Plasma Science, Vol. 40, No. 10, pp. 2425-2430 (2012)
5) T. Kiyan et al., Weibull statistical analysis of pulsed breakdown voltages in high-pressure carbon dioxide including supercritical phase, IEEE Trans. on Plasma Science, Vol. 39, No. 8, pp. 1729-1735 (2011)
6) T. Kiyan et al., Dielectric and discharge plasma characteristics of H_2O, CO_2 and He under supercritical conditions, J. Plasma Fusion Res. Vol.86, No.6 pp. 317-323 (2010), in Japanese.
7) T. Kiyan et al., Pulsed breakdown and plasma-aided phenol polymerization in supercritical carbon dioxide and sub-critical water, Plasma Processes and Polymers, Vol. 6, No. 11, pp. 778-785 (2009)

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Electronics and Computer Science Course

Laboratory of Intelligence Processing and System Architecture

Associate Prof. Takanori MATSUZAKI, Doctor of Engineering

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[Keywords]
FPGA, Computer Architecture, Fine grain multithread, Multi-agent

Research Outline

Our Laboratory is researching fine grain processor architectures, multi-agent and signal processing. We think that implementing in the hardware is important, so we are researching a real machine by using the FPGA.

[1]. Fine grain multi thread processor: Fuce processor

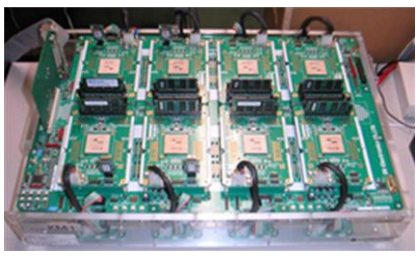
We are developing the Fuce processor based on the dataflow computing-model. We are taking another approach to develop the Fuce processor, a multithreading processor, which is dedicated to TLP.

[2]. Autonomous Mobile Robot (AMR) control systems based on a multi-agent model.

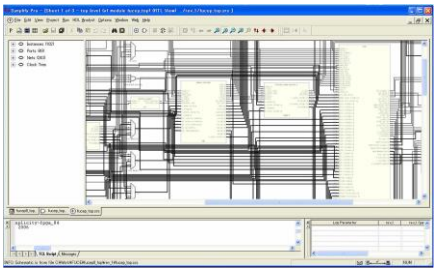
We want to model the movement of each part of the robot that realize a flexible control of the robot by using the reuse technology based on multi-agent models.

[3]. Real-time signal processing using FPGA

We are implementing signal processing system for noise removal in a concurrent parallel algorithms way using the FPGA. Then, we will research whether it is possible to noise removal in real-time using this systems.



FPGA Board



Layout of Fine grain Multithread

Latest publication and activity

[Book]

1) ”Unique Chips and Systems”, M.Izumi, S.Amamiya, T.Matsuzaki, M.Amamiya, Ed by E.John and J.Rubio, CRC Press, ISBN 1-4200-5174-1, pp.177-196, 2007.

[Published Paper]

1) K.Takahashi, T.Matsuzaki, T.Mine, T.Kawamura, K.Sugahara, ”Protection of Personal Information based on User Preference”, International Journal of New Computer Architectures and Their Applications, Vol.1, No.4, pp.822-834, 2011.

2) T.Matsuzaki, N.Urashima, M.Amamiya, ”Thread Control Mechanism for Multithreading Processor”, Proc. of CDES’10, pp.81-87, 2010.

[Patent]

1) U.S.Patent No.US 7,650,602: B2Parallel Processing Computer, 2010.

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Electronics and Computer Science Course

Information and Telecommunication Systems Laboratory

Associate Prof. Wataru Imajuku, Ph. D.

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[Keywords]
Optical fiber transmission, Fiber sensor, Positioning systems

Research Outline

Our laboratory is conducting research in the field optical communication technologies and their applications, i.e. next generation optical transmission systems, optical fiber sensor, and positioning systems based on optical wireless links.

[1]. Next Generation Optical Transmission Systems

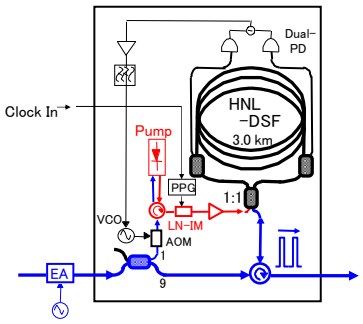
Our laboratory investigates low-noise optical transmission scheme based on optical parametric amplifiers with the combination of new optical modulation format. Specifically, our research laboratory studies the reduction of optical quantum noise via nonlinear parametric process in fibers and crystals.

[2]. Optical Fiber Sensor

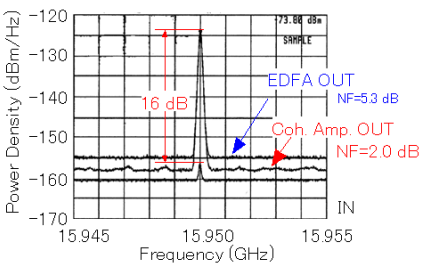
Optical fiber sensor can realize the distributed measurement of temperature and stress for buildings. We are conducting research on more high sensitive and economical fiber sensor based on Brillouin scattering process.

[3] Positioning Systems based on Optical Wireless Link

Optical wireless link based positioning technology is promising one for future high resolution positioning systems. Our laboratory investigates code based detection systems for its purpose.



Ultra-low noise optical amplifier



Noise spectra of the amplifier

Latest publication and activity

[Published Paper]

1) Multiperiod IP-Over-Elastic Network Reconfiguration With Adaptive Bandwidth Resizing and Modulation, OSA J. Opt. Comm. Network, vol. 8, No. 7, pp. A180-A190 (2016).

2) Rapid Restoration Sequence of Fiber Links and Communication Paths from Catastrophic Failures, IEICE Transaction on Fundamentals of Electronics, Communication and Computers, vol. E99, No. 8, pp. 1510-1517 (2016).

3) Adaptive and Efficient Multilayer Elastic Optical Network Planning, Proc. of ECOC 2016, Tu.3.D.1 (2016).

4) A Static traffic grooming algorithm for Optical Networks with Adaptive Modulation, Proc. of OECC/PS 2016, TuA1-3 (2016).

[Patent and so on]

1) Device and method for correcting a path trouble in a communication network, US Patent 8134920.

2) Routing and Wavelength Assignment Information Encoding for Wavelength Switched Optical Networks, Internet Engineering Task Force RFC 7581 (2015)

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Electronics and Computer Science Course

Human Informatics Laboratory

Associate Prof. Hitoshi TERAI, Ph.D. (Information Science)

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[Keywords]
Creativity, Insight, Problem Solving, Scientific Discovery

Research Outline

Our research interests is in higher-order cognitive process, especially the process of insight problem solving, scientific discovery, and creative activity. We are investigating these process by conducting psychological experiment and constructing cognitive models.

[1]. Insight

We are investigating bifacial characteristics (suddenness and gradualness) of the insight process from the viewpoint of a hypothesis search process by psychological experiments, and trying to explain how these characteristics arise using a computer simulation model.

[2]. Scientific Discovery

Emergent patterns arise in a wide variety of situations (physical and social situations). We are focusing on the effects of emergent patterns on discovering local rules as basic principles underlying phenomena by using Conway's Game of Life (Fig. 1).

[3]. Creativity

The manner of assessing creative products is one of the central issues when evaluating creative process. We are investigating the nature of creative assessment (Fig. 2).

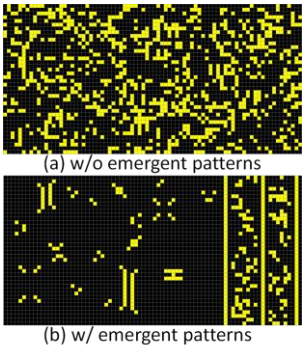

Fig. 1: Game of life as the Rule discovery task

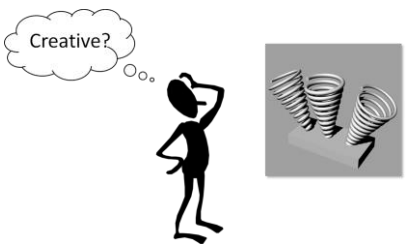

Fig. 2: Assessment of design creativity

Latest publication and activity

[Book]

1) "A Chance Favours a Prepared Mind: Chance Discovery from Cognitive Psychology," Terai, H., & Miwa, K., Studies in Computational Intelligence, vol. 423. In Ohsawa, Y. and Abe, A. (Eds.), Advances in Chance Discovery (pp. 33-48). Springer Berlin Heidelberg. (2013)

[Published Paper]

1) "An experimental study on observation of fact in explanation reconstruction," Terai, H., Miwa, K., & Toyama, N., Proceedings of 38rd annual conference of the cognitive science society, pp. 686-691 (2016)
2) "An Experimental Study on Explanation Reconstruction through Reinterpretation of Key Facts," Terai, H., Miwa, K., & Matsubayashi, S., Cognitive Studies, vol. 22, no. 2, pp. 223-234, in Japanese (2015)
3) "An Experimental Study on Process of Identifying of Unexpected Events by Using a Magic Trick Task," Terai, H., Miwa, K., & Shibata, H., Cognitive Studies, vol. 19, no. 2, pp. 146-163, in Japanese (2012)
4) "Sudden and Gradual Processes of Insight Problem Solving: Investigation by Combination of Experiments and Simulations," Terai, H. & Miwa, K., Proceedings of 28th Annual Meeting of the Cognitive Science Society, pp. 834-839 (2006)
5) "Insight Problem Solving from the Viewpoint of Searches for Hypothesis and Data Spaces," Terai, H., Miwa, K., & Koga, K. Cognitive Studies, vol. 12, no. 2, pp. 74-88, in Japanese (2005)

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Social Environmental Science Course

Building Structure Laboratory

Prof. Kazuaki TSUDA, Doctor of Engineering

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[Keywords]
shear wall, reinforced concrete, shear strength

Research Outline

I would like to develop the design guideline for earthquake resistant reinforced concrete buildings based on the study on the evaluation methods for elastic and inelastic behavior of main structural members.

[1]. The calculation method for the shear strength of RC structural members

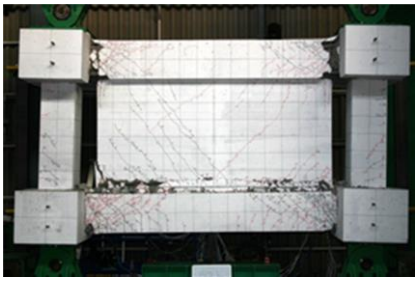
On the existing design guideline for the shear strength of RC structural members, the real phenomenon is not considered. So, the design guideline based on the real phenomenon is studied.

[2]. The calculation method for the shear behavior of RC shear walls

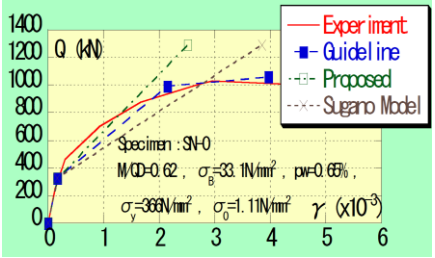
The shear behavior of RC shear walls is occupied with shear behavior. So, the behavior is very complex. The evaluation method for the shear behavior is studied.

[3]. The calculation method for the flexural behavior of RC shear walls with openings

On the existing design guideline for shear walls, the influence of openings is considered only on the shear behavior. So, the flexural behavior of RC shear walls with openings is studied.



The experiment of shear wall



The evaluation of Q-γ relationship

Latest publication and activity

[Book]

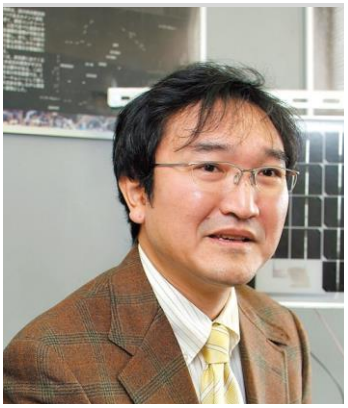
1) "State-of-Art Report on High-Strength Concrete," Architectural Institute of Japan., (2009)
2) "Guideline for Performance Evaluation of Earthquake Resistant Reinforced Concrete Buildings," Architectural Institute of Japan., (2004)
3) "Design for Reinforced Concrete Structures," Architectural Institute of Japan., (2002)

[Published Paper]

1) "A Study on the Calculation Method for Flexural Behavior of Un-Bonded Pre-Stressed Concrete Beam," Kazuaki Tsuda, Journal of Structural and Construction Engineering, Architectural Institute of Japan , Vol.80, No.710, pp. 659-668 (2015)
2) "A Study on the Calculation Method for the Shear Strength of Shear Walls," Kazuaki Tsuda, Journal of Structural and Construction Engineering, Architectural Institute of Japan , Vol.74, No.645, pp.2069-2075 (2009)

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Social Environmental Science Course



Building / Urban Environmental Engineering

Prof. Hirotoshi YODA, Doctor of Engineering

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[Keywords]
Environmental survey, Energy, Environmental symbiosis, Environmental education

Research Outline

To improve a current environment, the environment-friendly and human-friendly building and city planning are promoted.

[1]. Surveying of Building/Urban Environment

The current state of the environment is understood by measuring physical elements such as sound, thermal, light, and air of building/urban spaces, and we propose to attempt the comfort.

[2]. Research on Urban Energy and Urban Infrastructure

We propose the how should be the facilities and the infrastructure maintenance related to the city metabolism: energy, water, and waste that are considered regional characteristics. For its practice, we examine the system construction technique for the practice and the evaluation technique. Under that, we aim at the city/community where the small load to environment planning.

[3]. Investigation/Design of Eco-friendly Building

We design the eco-friendly housing through the questionnaire of residence condition and living act against residents, and measurement survey of the energy consumption. Moreover, we propose the technology for the building design that aims at the decrease of the environmental load from both sides of an environmental engineering and equipment technology, and executes the experimental study.

[4]. Research for Eco-friendly Municipality/City Planning

We support the eco-friendly approach by local governments and the offices positively. Moreover, we support the planning of safety and can relievable city.

[5]. Practicing Environmental Education and Participating in Environmental Volunteer Works

We work on the solution of environmental problems through helping study of environment, practicing the environmental preservation activity intended for all generation.

Bamboo Architectute

Photovoltaic Generation System

Latest publication and activity

[Book]

1) “Urban Environmentology,” Editing Committee of Urban Environmentology Teaching Materials, H. Yoda et.al, Morikita Syuppan, (2003)
2) “Klimaatlas for Urban Environment; City Planning using Climate Information,” AIJ., T. Katayama, H. Yoda et.al, Gyousei, (2000)

[Published Paper]

1) “Construction of the Support System for Illegal Abandonment and Unsuitable Processing Prevent of Waste, and its Empirical Study,” H. Yoda, Journal of Technology and Design, AIJ, No.23, pp.229-232 (2006)
2) “Investigation of Energy and Water Consumption for an Environmentally Symbiotic Apartment House,” H. Yoda et.al, Journal of Architecture and Planning, Environmental Engineering, AIJ, No.549, pp.67-74 (2001)
3) “Investigation of Damage from Salty Breezes and Sea Water Aerosol Concentration at Seaside Area,” H. Yoda, Journal of Architecture and Planning, AIJ, No.522, pp.115-121 (1999) [*]

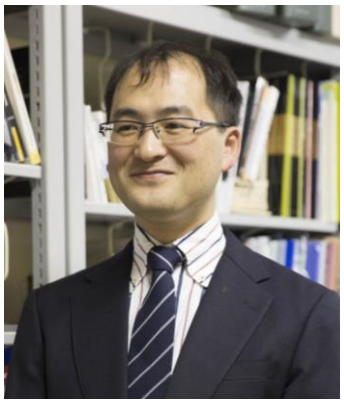
[*] Encouragement Prize of Architectural Institute of Japan (AIJ), Apr. 2002

[Patent and so on]

Installation Structure of Solar Cell Module, Patent application 2004-318286 (2004)

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Social Environmental Science Course



Environmental Economics Laboratory

Prof. Yusuke SAKATA, Ph. D. (International Public Policy)

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[Keywords]
Forest management, Fair Trade, Econometrics, Joint production

Research Outline

Joint production process of natural capital is key issue of my research. The process produces many ecological services, which support local and global sustainability. I evaluate sustainability of local polices such as the forest management, waste management, fair trade and climate change using economic foundation.

[1]. Forest Management

Sustainable management of forest are growing concern in the world. While urbanization draws local population to cities, villages in the mountain face severe population loss. My research focuses on the sustainable forest management including local life, based on the Payment for Ecological Services.

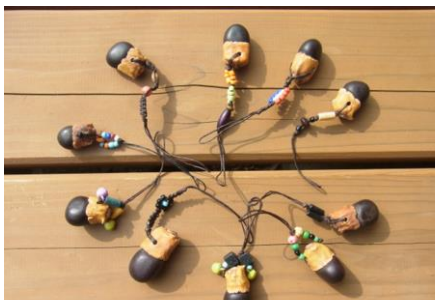
[2]. Fair Trade

Every woman in the local villages can engage in handicraft project. My research is to evaluate the effects of handicraft projects in fair trade activity. My research is the projects for the hill tribe in Northern Thailand.

[3]. Waste Management

Econometric analysis of Municipal Solid Waste Management. I evaluated the policy effect of curve side recycling and user charge policy.

International Conference



Fair trade goods

Latest publication and activity

[Book]

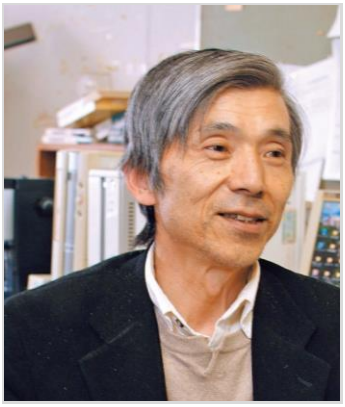
1) “Waste Managemnet in the Recycle Society”, Yusuke SAKATA, Koyo Shobo (2010; in Japanese).
2) “Environmental Economics of Waste Management”, Yusuke SAKATA, Koyo Shobo (2007; in Japanese).

[Published Paper]

1) “A Choice Experiment Analysis of the Residential Utility of Waste Management Services – the Example of Kagoshima City Japan”, Yusuke SAKATA , Waste Managemnt, 27(5), pp. 639-644(2007).
2) "The Influence of Environmental Deterioration and Network Improvement on Transport Modal Choice", Junyi Shen, Yusuke Sakata and Yoshizo Hashimoto, Environmental Science & Policy, 12, pp. 338-346(2009).
3) "Estimating educational effects in waste management services", Yusuke Sakata and Kaoru Okamura, International Journal of Environment and Waste Management , 7, pp. 267-278(2011).

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Social Environmental Science Course



Building Construction Laboratory

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[Keywords]
Concrete, Strength, Industrial waste, Recycled aggregate class L

Research Outline

We have a study on mainly building materials science. For example we have done basic research related to concrete strength, recycling of industrial waste discharged accompanying the demolition of buildings, and so on.

[1]. A study on the method for estimating of concrete strength

Usually, strength of concrete is estimated by day-degree method. It is determined by Integral of product of curing temperature and time. In this study, we will be propose the further practical formula for estimation of concrete strength, which is applicable for wide range age of concrete.

[2]. A study on the temperature dependence of concrete strength

In general, the strength of the material is dependent on temperature, that the temperature is lower the strength becomes higher. Concrete is no exception. However, in Japanese Industrial Standards there is no provision regarding the temperature of the concrete specimen at the time of strength test. We are conducting research to solve this problem.

[3]. A study on the new uses of recycled aggregate class L

Recycled aggregate class L's uses is limited because of its poor quality. However, recycled aggregate class L is less cost and energy required for production. Furthermore, the amount of fine powder generated when manufacturing the recycled aggregate class L is smaller than the class M or H. Therefore, performing the application development of recycled aggregate is significant. We have done research on the new uses of recycled aggregate class L.

Latest publication and activity

[Book]

1) "Building materials and materials design" Yoshihito Kawakami et al, Asakura Syoten, (1998)
2) "Applicability of various types of industrial waste for concrete material" Takehiro Yamasaki et al, Japan Concrete Institute Kyushu Branch, (1999)
3) "Construction guidelines and the description for hot weather concreting" Yasunori Matufuji et al, Architectural Institute of Japan, (2000)
4) "Standards and performance evaluation of concrete admixtures" Yoshiaki Sato et al, Japan Concrete Institute Kyushu Branch, (2000)
5) "Building materials" Yasunori Matufuji et al, Asakura Syoten, (2009)

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Social Environmental Science Course

Ergonomics in Daily Living Laboratory

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[Keywords]
Surface EMG, Muscle fatigue, Low-level, Motion space

Research Outline

All of the studies are related to daily living and moderate work conditions. The main subjects are muscle cost, enjoy our life, energy expenditure of the equipment, and dietary management. These subjects don't relate to each other. I just want to offer some aids to improve daily living with them.

[1]. Evaluation of muscle cost in daily activities with EMG

Surface EMG has been studied to evaluate muscle fatigue in many studies. Many of the studies, however, did not consider light activities. I have tried to evaluate muscle cost in daily activities with surface EMG and fatigue sensation.

[2]. Development of the applications of pictures by a local painter Hiroyuki Morofuji

The pictures of the local artist show various aspects of daily living in this area and common humanity. Although the value is not high as the world arts, they are precious resources in this area. They make us find lovely scenes around us. Data base, panels, digital museum have been developed as the applications of them to enjoy our life.

[3]. Promotion of the reduction of energy expenditure of daily equipment

Much energy is used in present living. Information to user for the reduction of the energy has been studied. The information is a list of energy expenditure of various usage of equipment in daily living such as TV, air-conditioner, computer, car, illumination, oven, boiler, and so on. The values are shown to be compared among them easily. So we can understand what activities expend energy much. The list gives help to choose actions in daily living under restriction of energy expenditure.

Latest publication and activity

[Published Paper]

1) The fascination of Hiroyuki Morofuji's sketches (in Japanese), Jun-ya Ohashi, Bulletin of the Department of Management and Business, Kindai University, No.5,pp.65-86(2017)

2) The regard for the assessment of muscle fatigue with surface EMG (in Japanese), Jun-ya Ohashi, J.Ergonomics in Occupational Safety and Health, Vol.16(1) (2015)

3) Fatigue sensation, electromyographical and hemodynamic changes of low back muscles during repeated static contraction, M.Movahed, J.Ohashi, N.Kurustien, H.Izumi, M.Kumashiro, Eur.J.Appl.Physiol., Vol.111,pp.459-467 (2011)

4) Assessment of workrelated muscle strain by using surface EMG during test contractions interposed between work periods of simulated mushroom picking, J.Ohashi, AK.Blangsted, PK.Nielsen, K.Jørgensen, J.Human Ergol.Vol. 39(2), pp57-68 (2010)

5) The assessment of muscle strain with surface EMG during simulated mushroom picking, J.Ohashi et al, J.Human Ergol.Vol. 37, pp.13-22 (2008)

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Social Environmental Science Course

Architecture Planning Laboratory

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[Keywords]
Architecture planning, Remodeling, Community center

Research Outline

Current Japan entered the population decrease world already. The Japanese local-government made a building corresponding to a demand till now become redundant now. I study a method of reorganization of the community stock by making a redundant state of the community institution in the population decrease world clear.

[1]. A study of planned technique by preparation process analysis of the self-government center

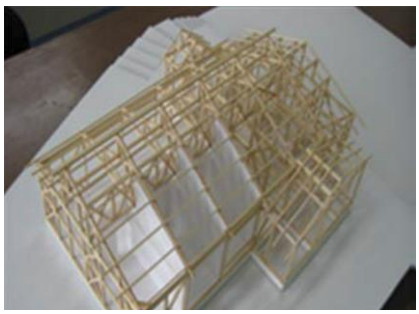
It is to develop a method a study of plan technique builds a the community institution corresponding to a formation process of community, and to arrange

[2]. A study of remodeling method of a the community institution

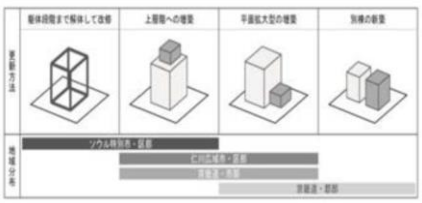
Development of method to plan a the community institution to needing it corresponding to other functions except an original purpose again

[3]. Arrangement system of the Korean self-government center and a change of institution function

I examine a change system of Korean institution function to have a system I function, and to switch a the community institution



A function switch plan idea of a redundant institution



Institution update system of the Korean self-government center

Latest publication and activity

[Book]

1) A welfare environmental design for a person ,"Naohisa Fujimoto & Toru Ihara, Kajima Institute Publishing (2008)

[Published Paper]

1) "The Planning Method to Examine in a Preparation Process of the Self-government Center in the Seoul ," Toru Ihara et al, Regional Community Facilities planning and design, Vol.32,pp105-110,(2014)
2) "A Study on change of user examined from institution update of kominkan. A case study for kominkan in Kitakyusyu city 50 years. " Toru Ihara et al, Regional Community Facilities planning and design, Vol.32,pp 99-104 (2014)
3) "A Study on Functional Establishment of Railway Station for Urban Regeneration in the regional areas." Toru Ihara et al, Regional Community Facilities planning and design, Vol.31,pp 281-288 (2012)

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Social Environmental Science Course

Management Strategy Laboratory

Prof. Jeeyeon HA, Ph.D. in Economics

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[Keywords]
Strategy, Global Companies, Innovation, Asian Companies, Culture

Research Outline

For the progress of globalization, hyper-competition, and innovation, the environment surrounding Japanese companies has rapidly changed. The purpose of my research is to analyze the strategy, competition, and competitive advantage of those companies.

[1]. Competitive advantages in global companies

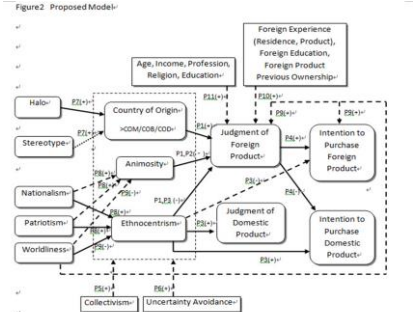
Recently not only Western and Japanese companies but East Asian i.e. Korean, Chinese, and Taiwanese companies have rapidly developed and have accelerated their global activities. In our laboratory it is researched that the source of competitive advantage in East Asian companies has been built by the unique method using human network.

[2]. Role of the government in the innovation cluster

Formation of the innovation cluster is currently one of the most important issues for the East Asian countries including Japan. In this study we researched that the role of the government was important in those countries unlike Silicon Valley.

[3]. The impact of divergent cultures in consumer activities

In our research, cross cultural survey are conducted to figure out how divergent cultures influence consumer cognition, decision, and behavior differently.



A consumer domestic/ foreign product choice model

Yahoo!'s headquarters which is located in Silicon Valley

Latest publication and activity

[Book]

1) "2009 Global Recession and Regional Companies," Kyushu Economic Research Center, (2009) in Japanese

[Published Paper]

1) "Social Religiosity: Concept and Measurement across Divergent Cultures Type," Anil Mathur *et al.* and Jeeyeon Ha, *Asia Pacific Journal of Marketing and Logistics*, Vol.27 Issue 5, pp. 717-734 (2015)
2) "Towards a Methodology for Developing Innovation Theories: an Assessment of Reviews," Jeeyeon Ha, *Japan Academy for Asian Market Economies*, vol. 17, pp. 131-144 (2014) in Japanese
3) "Formation of Overseas Koreans Network to Build a Global Leader Nation," Jeeyeon Ha and Changhyun Kang, *The National Assembly 2014 Overseas Koreans Trade and Economic Forum*, pp.71-90 (2014) in Korean

[Works]

1) "Personal-Spirituality across Cultures," Anil Mathur *et al.* and Jeeyeon Ha, *Western Decisions Sciences Institute Conference* (2015)
2) "Strategic Management: Competitiveness and Globalization," Masaharu Kuhara supervisor of translation, Cengage Learning, (2014) in Japanese

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Social Environmental Science Course

Financial System Laboratory

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[Keywords]
Financial system reform, Korean economy, Finance in Asia

Research Outline

My research interests are comparative analyses between Japan and Korea on financial system, corporate system, and the relations among the government, financial institutions and corporations.

[1]. Comparative Institutional Analysis on the Economic System of Japan and Korea

Theoretically analyze why and how Japan and Korea have different economic system even though they have a lot of similarities in the economic environments.

[2]. Directions of Financial System Reform in Japan

Research on obstructive factors in lumbering structural reform in Japan's financial system and its future directions.

[3]. Regional Revitalization through relationships with Asian Economy

Research on regional revitalization in Kyushu through relationships with growing Asian economy.

Latest publication and activity

[Book]

1) "Theoretical Analysis on the Structural Reform in Korea," Takao Iijima, Mitsubishi Research Institute, (2004) in Japanese
2) "Comparative Institutional Analysis on the Economic System of Japan and Korea," Kazuhito Ikeo, Kyuchan Hwang and Takao Iijima, Nikkei Inc., (2001) in Japanese

[Published Paper]

1) "Current situation and policy evaluation on the transformation of the industrial structure in Japan," Takao Iijima, Reports of Faculty of Humanity-Oriented Science and Engineering, 21, pp. 8-13 (2014) in Japanese
2) "Macroeconomic Impacts of Foreign Exchange Reserve Accumulation in Korea," Takao Iijima, Reports of Faculty of Department of Management and Business, 3, pp. 59-70 (2013) in Japanese

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Social Environmental Science Course

Sport Management Laboratory

Associate Prof. Jiro KURODA, Master of Arts

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[Keywords]
Sport Management, Draft System, Global Human Resource Development

Research Outline

My research interests are professional sport business such as team front management, player draft system, lifetime wage, and post-professional second career. I study the human resources which can play an active part in sports industries, as well as international exchange and cooperation through sport.

[1]. Player Draft System

Analyzing the careers of over 1000 players, I found that the later a player is selected in the draft process, the shorter his career in baseball. Players selected in the first three rounds tend to have longer careers than those selected in later rounds.

[2]. League Management Policy

The cycle of success in baseball gives an advantage to successful teams: winning teams have greater attendance, providing more funds, which then allows them to acquire better players. For the league, however, a competitive balance between teams creates a successful league. Therefore, some regulation in NPB that transferred funds to less-successful teams is recommended.

[3]. Global Human Resource Development Through Sport

Young people participating in the Japan Oversees Cooperation Volunteers can learn a lot through the experience, such as language skills, intercultural skills and understanding, and problem-solving.

Latest publication and activity

[Book]

1) “Sport and international cooperation ,” Kazuhiko SAITO, Chiaki OKADA, Naofumi SUZUKI, Jiro KURODA.,et al. Taishukan., (2015) in Japanese
2) “Sport Business Introduction”, Jiro KURODA, Toshifumi ENDO., et al., Sobunsha,(2012) in Japanese

[Published Paper]

1) “Global Human Resource Development through Sport - The Case Study of Japan Overseas Cooperation Volunteers: (1) The Expectations of Japan Overseas Cooperation Volunteers,” Jiro KURODA, Journal of the Japan Association for Global Competency Education, Vol.2 No.2, pp. 23-32 (2015) in Japanese
2) “A Study on the Baseball Team Management of Professional Baseball in Japan - Based on the Relation of Team Performance, Salary and Spectator Attendance,” Jiro KURODA, Hayato UCHIDA, Journal of Physical Exercise and Sports Science, vol.19 No.1, pp. 91-98 (2013) in Japanese

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Social Environmental Science Course

Architectural Design Laboratory

Associate Prof. Hiroshi KOIKE, Doctor of Design

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[Keywords]
Computer Simulations, Ubiquitous Technology, Visualization, GIS

Research Outline

Various kinds of information are embedded in the urban scenes of modern cities. It should be very important to precisely grasp and analyze these hidden information for human activities. I try to visualize these information with computer simulations, and support urban life using these information with ubiquitous technology and GIS.

[1]. Research on Urban Analysis with Computer Simulations

The analysis of urban scenes such as; 1)3D model simulations, 2)exchange test of the urban elements, 3)urban analysis with walk-through models, and so on.

[2]. Basic Research on Information Infrastructures

The ways of supporting urban life with ubiquitous computing technology are examined through demonstration experiments.

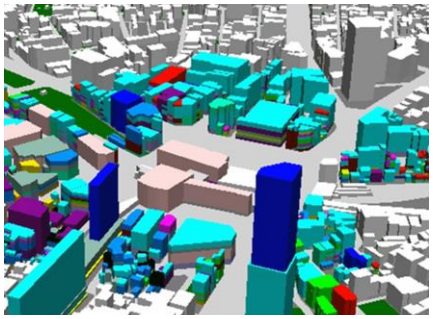
[3]. Research on GIS education in Architectural and Urban Design Fields.

Based on the master's researches using GIS and GIS lectures in the Graduate School of Meiji University, the effectiveness of GIS in the architectural and urban design fields are discussed.

[4]. Research on Visualizing Factors influencing Living Environment

Visualizing the influences to human activities of; 1)color effects, 2)urban scenes, 3)greens, 4)space syntax, 5)open spaces and so on.

Ubiquitous Mall Project in Togoshi



3D Mixed-use Map of Shibuya

Latest publication and activity

[Book]

1) "GIS for Urban Design," H.Koike, V2solutions., (2015)
2) "Urban Decording," H.Koike, V2solutions, (2007)

[Published Paper]

1) "Decision Making of Human Activity by Information through Ubiquitous Technology," H.Koike, M.Kobayashi, Journal of Habitat Engineering, pp. 154-164 (2010)
2) "Development of the Models showing the Extent of Natural Surveillance by using Light Projecting Method," H.Koike, T.Yamamoto, Y.Matsumoto, S.Kashihara, H.Yamagishi, K.Minobe, Journal of Technology and Design, Vol.14, #27, pp.311-314(2008)

[Works]

1) Tagawa-Ita Station Renewal Project (2016)
2) RoboCup Competition Field (2014)
3) Renovation of S Junior High-school (2013)

Graduate School of Humanity-Oriented Science and Engineering, Kindai University

Social Environmental Science Course

Architectural Environment & Facilities Laboratory

Lecturer, Eisuke HORI, Master of Engineering

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[Keywords]
Building facilities, Energy saving, Environment design

Research Outline

In this laboratory, we are conducting research on disaster-resistant building facilities, mainly for building energy supply systems such as in-house power generating station, in order to increase the number of buildings that can continue necessary activities even in the event of a disaster.

[1]. Disaster-Resilient Building Facilities and Urban Infrastructure

Even when infrastructure such as electricity and water supply and sewer stops in the event of a disaster, we are studying building facilities to maintain building function.

[2]. Research on Smart Energy System

Research about desirable situation of building facilities and local energy system in the era of urban environmental management using ICT (Information and Communication Technology).

[3]. Research on Utilization of Underground Mall

Research on the possibility of underground mall as a staying space for people who are unable to return home after disasters.

[4]. Environmental architectural Design Rooted in Communities, Culture and Climate

Study of elemental technologies for environmental architectural design based on characteristics of community, culture and climate.

Experiences of staying in the underground mall

Examples of environmental architectural design

Latest publication and activity

[Book]

1) “Creative New Tokyo,” Eisuke Hori et al, Waseda University Publishing., (2017)
2) “Town Planning Thinking from the Urban Environment,” Eisuke Hori et al, Morikita Publishing., (2017)

[Published Paper]

1) “Research about the Medical Equipment Load at the Time of Disaster,” Eisuke Hori et al, Journal of Environmental Engineering (Transactions of AIJ), Vol.81, pp.625-632 (2016)
2) “Research on Utilization of Underground Malls as Shelters for Major Natural Disasters -Part 2- Actual condition of thermal environment and energy consumption immediately after the Great East Japan Earthquake in underground malls,” Eisuke Hori et al, Annual 2016 Journal Asia Urban Environment, pp.521-526 (2016)

[Work]

1) “Ono-Sake Warehouse (Logistics warehouse, store, office) ,” Eureka + G architects studio, Ibaraki Prefecture. (2016)

The list of tuition fees and other expenses for students enrolling for 2015

(1) First-half doctorate and master's courses (Unit: Yen)

Graduate School of Humanity-Oriented Science and Engineering					
	Enrollment fee	Tuition fee (first semester)	Student health insurance fee	Year total	Total at enrollment
First year	200,000	950,000 (475,000)	4,500	1,154,500	679,500
Second year		1,000,000 (500,000)	4,500	1,004,500	

(2) Second-half doctorate courses (Unit: Yen)

Graduate School of Humanity-Oriented Science and Engineering					
	Enrollment fee	Tuition fee (first semester)	Student health insurance fee	Year total	Total at enrollment
First year	200,000	950,000 (475,000)	4,500	1,154,500	679,500
Second year		1,000,000 (500,000)	4,500	1,004,500	
Third year		1,030,000 (515,000)	4,500	1,034,500	

Remarks

- Total upon enrollment is the total amount of enrollment fee, tuition fee (first semester), and student health insurance fee.
- Tuition fee, etc. (second semester) should be paid in October.
- In addition to the above, the Alumni association lifetime member fee (10,000 Yen, only in the final year) is required.