

type of seeds	number	field	title	researcher	summary	posted
research	2016-1024-08	Life sciences	Amyloid β Detection System using CHRNA7 Fragments	Faculty of Science and Engineering Graduate School of Advanced Science and Engineering	<ul style="list-style-type: none"> ● We narrowed down the binding region of CHRNA7 to AB. ● The methods to detect AB using the purified GST-CHRNA7 fragments. ● We already confirmed the binding of AB and the CHRNA7 fragments. 	2016/10/24
research	2016-1024-07	Life sciences	New Therapy of Precocious Puberty and Reproductive Dysfunction by Means of GnIH, a Novel Neurohormone	Professor Faculty of Education and Integrated Arts and Sciences School of Education	<ul style="list-style-type: none"> ● Discovery of a novel neuro hormone(GnIH) (Fig.1) ● Elucidation of the molecular mechanism of the GnIH/GNIH action to control the reproductive function - Central precocious puberty (CPP) that GnIH/GNIH functional decline leads (Fig.2) - Central reproductive dysfunction (CRD) that hyperfunction of GnIH/GNIH leads (Fig.3) 	2016/10/24
research	2016-1024-06	Life sciences	Collagen-like Peptide Polymer with Gelating Property	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Chemistry and Biochemistry	<ul style="list-style-type: none"> ● Disulfide-crosslinked polymer of triple-helical peptides (Fig. 1) ● The material can be shaped into hydrogels and films etc. (Fig. 2). ● Cell behaviors can be regulated by introducing signaling sequences (Fig. 3). ● Cell behaviors can be regulated by altering the stiffness of the gel (Fig. 4). 	2016/10/24
research	2016-1024-03	Life sciences	Self-driven Perfusion Culture System Using the Paper-based Double-layered Scaffold	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	<ul style="list-style-type: none"> ● The double-layered scaffold consisting of a paper for medium perfusion and electrospun gelatin microfibers for cell adhesion is developed (Fig. 1). ● Self-driven, stable, and constant perfusion of the medium has been achieved by using both capillary action and siphon phenomenon of the paper-layer (Fig. 2). The flow rate is controllable just by changing the height levels. 	2016/10/24
research	2016-1024-02	Life sciences	On-Chip Quasi-in vivo Assay Technology for Predictive Drug Discovery and Diagnostics	賢二 安田 教授 理工学術院 先進理工学部	<ul style="list-style-type: none"> ● We have developed an on-chip quasi-in vivo technology consisting of, (1) non-invasive cell sorting, (2) 3-D cell network formation, (3) non-destructive single cell dynamics measurement. 	2016/10/24
research	2016-1024-01	Life sciences	High-speed Tissue Dissection System for Spatial Omics Analysis of Tissue	Research Council (Research Organization) Institute for Nanoscience & Nanotechnology	<ul style="list-style-type: none"> ● The automated system for rapid tissue microdissection ● Tissues are automatically dissected and transferred into plate within 8 min for 96 sampling sites. 	2016/10/24
research	2015-1023-05	Life sciences	Protein crystallization using membrane separation method	Assistant Professor Faculty of Science and Engineering School of Advanced Science and Engineering	<ul style="list-style-type: none"> · Protein solution is concentrated by using ultrafilter · Concentration speed is controlled optionally by pressure control · Separation and collection of proteins are very easy 	2015/10/23
research	2015-1023-04	Life sciences	Method for determining the heat treatment on meat	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	To determine the heat treatment on meat by evaluation of heat denaturation of protein using Raman spectroscopic analysis.	2015/10/23
research	2015-1023-03	Life sciences	Novel antimicrobial peptides	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Chemistry and Biochemistry	Novel antimicrobial peptides which form triple-helical structure and contain Arg cluster in the N-terminal region and disulfide bonds in the C-terminal region.	2015/10/23
research	2015-1023-01	Life sciences	Analytical systems of homologous recombination in the reconstituted chromatin	Guest Professor Faculty of Science and Engineering School of Advanced Science and Engineering	We established the in vitro systems to evaluate the RAD51-mediated or DMC1-mediated homologous recombination reaction using reconstituted chromatin substrates.	2015/10/23
research	2015-1022-04	Life sciences	Drug for epigenomic disruption caused by hyperglycemia	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Chemistry and Biochemistry	Does hyperglycemia cause a change of epigenome? A compound which prevents hyperglycemia-induced epigenomic aberration, could be a novel drug for diabetes associated with various diseases.	2015/10/23

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research	2015-1022-03	Life sciences	Neuronal differentiation inducer	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Chemistry and Biochemistry	· A series of novel ageladine A derivatives, which has a specific activity on the neuronal differentiation	2015/10/23
research	2015-1022-02	Life sciences	High-throughput screening system with cultured cell lines	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	· Cells are cultured in various conditions (growth factor, extracellular matrix, etc.) after retroviral induction of target genes, and evaluated by cell growth/migration/invasion and malignant transformation. · Optimization for 96-well culture plates enabled high-throughput functional assays.	2015/10/23
research	2015-1022-01	Life sciences	Development of Functional foods regulating circadian clock system	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	· Screening of food materials on rhythm in cells · Select from materials based on Amp, Phase, Period · Screening of food material for BF or Dinner on rhythm · Confirmed by clock gene mRNA in mice & human	2015/10/23
research	2015-0303-02	Life sciences	Evaluation Method for Static Stretching	Professor (retired) Faculty of Science and Engineering School of Creative Science and Engineering Department of Modern Mechanical Engineering	· Quantitative evaluation of muscle tone · Detection of muscle hypotonicity · Simple indentation test	2015/03/03
research	2015-0303-01	Life sciences	Robotic System for Breast Cancer Diagnosis and Treatment	Professor (retired) Faculty of Science and Engineering School of Creative Science and Engineering Department of Modern Mechanical Engineering	· Measuring a location and stiffness of a cancer as palpation · Inserting a needle for treatment accurately into a cancer by compression using palpation probe to stabilize the cancer	2015/03/03
research	2015-0302-07	Life sciences	Development of Support System for RFA	Professor (retired) Faculty of Science and Engineering School of Creative Science and Engineering Department of Modern Mechanical Engineering	· Research toward precise cancer ablation by using robot technology · Development of sensing method and estimation method for physical quantity related as ablation during operation	2015/03/02
research	2015-0302-06	Life sciences	Visual Assistance System for Endoscopic Surgery	Professor (retired) Faculty of Science and Engineering School of Creative Science and Engineering Department of Modern Mechanical Engineering	· Visualization of anatomy in a way it is normally unachievable · Constructed with combination of traditional endoscopes	2015/03/02
research	2015-0302-05	Life sciences	Robot Control using Muscle Bulge Movement	Professor (retired) Faculty of Science and Engineering School of Creative Science and Engineering Department of Modern Mechanical Engineering	· Novel robot control method using a new bio signal · Estimate the operation quantity using muscle bulge movement	2015/03/02
research	2015-0302-04	Life sciences	False Step Prediction System and False Step Prevention System	Professor (retired) Faculty of Science and Engineering School of Creative Science and Engineering Department of Modern Mechanical Engineering	· Prediction of false step · Wearable device with comfortable wear feeling	2015/03/02

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research	2015-0302-03	Life sciences	Haptic Interface for Navigation of the Visually Impaired	Professor (retired) Faculty of Science and Engineering School of Creative Science and Engineering Department of Modern Mechanical Engineering	· A haptic interface for navigation · The generated centrifugal force using two eccentric weights is transmitted the user · It is possible to indicate in any direction	2015/03/02
research	2015-0302-02	Life sciences	Robot of Gait Training Assisted by Physical Therapist	Professor (retired) Faculty of Science and Engineering School of Creative Science and Engineering Department of Modern Mechanical Engineering	· Robot of gait training assisted by physical therapist · Modeling based on assisted movement · Control robot adapted to individual difference of hemiplegia patient	2015/03/02
research	2015-0302-01	Life sciences	Walk Rehabilitation Support Robot for Symmetrizing Stance Phase	Professor (retired) Faculty of Science and Engineering School of Creative Science and Engineering Department of Modern Mechanical Engineering	· Walk rehabilitation support robot for symmetrizing stance phase · Real-time induction of stance phase · Split belt treadmill with differential velocity	2015/03/02
research	2011-0427-01	Life sciences	The synthesis of high yield hydroxyaspartic acid and its use in antitumor drugs	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Applied Chemistry	In this research seed we succeeded in synthesizing hydroxyaspartic acid, with 100% yield, through site-specific addition of hydroxyl groups to aspartic acid in few steps, by making use of the biological reactions of enzymes.	2014/05/21
research	2011-0427-02	Life sciences	The emission of white light through enzyme hydration of 2-naphthoic acid	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Applied Chemistry	Using cytochrome P450 (enzyme) on 2-naphthoic acid to add a hydroxyl group enables the easy, one-step synthesis of a compound that emits white light. We have also synthesized compounds that emit blue light, and there is the potential to synthesize compounds that emit a variety of other colors.	2014/05/21
research	2011-0427-03	Life sciences	A method of freely synthesizing hexapeptides from peptides	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Applied Chemistry	For example, to synthesize amino acids A and B, a method of implementing biocatalysts (enzymes) enables the synthesis of specific structures only (e.g., when AA, AB, BA and BB combinations are possible, only AB may be selectively synthesized). The peptide too, gains one site-specific structure.	2014/05/21
research	2011-0517-01	Life sciences	Investigation of prenatal care through noninvasive diagnosis and analysis	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	Using a SQUID (superconducting quantum interference device), which is a high sensitivity magnetic sensor, to diagnose and analyze the mother's electrocardiograph can shed light on the level of relaxation or stress in the fetus through correlation between the mother and the fetus. The effects of prenatal care have so far not been scientifically elucidated, but this technology may shed light on what kind of care is beneficial.	2014/05/21
research	2011-0517-02	Life sciences	Visualization of the brain's response to stimuli (smell) in a murine model using noninvasive measuring of biomagnetism	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	The SQUID (superconducting quantum interference device), which is a high sensitivity magnetic sensor, is able to measure subtle magnetic fields (magnetoencephalographs) created by nervous activity, and it is not hindered by the skull. This allows the accurate and individual tracking of nervous activity. For example, comparing the magnetoencephalographs of odorant receptor deficient murine models that do not respond to odorant stimuli (knockout mice), with those of normal mice, allows accurate visualization of cerebral nerve activities in response to chemical odorant stimuli.	2014/05/21
research	2011-0517-03	Life sciences	Comparison of a murine model with humans using noninvasive measuring of biomagnetism, and its application in heart disease diagnosis	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	We can provide a method of early heart disease detection that combines life science techniques with SQUID* measurements. For example, we can create a murine model of myocardial infarction (a knockout mouse), and take magnetocardiographs using SQUID from birth until the onset of myocardial infarction, and then until it dies, to ascertain the changes that occur in the magnetocardiographs with the onset of myocardial infarction. Moreover, comparing them with the results of autopsies will allow us to make diagrams to draw correlations between the states of the disease and the magnetocardiographs.* SQUID (superconducting quantum interference device): A high sensitivity magnetic sensor. It is able to measure weak magnetic fields (magnetoencephalographs and magnetocardiographs) generated by neurotransmissions (brain activity) or movement of the myocardium.	2014/05/21

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research	2011-0517-04	Life sciences	Comparison of a murine model with humans using noninvasive measuring of biomagnetism, and its application in brain disease diagnosis	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	SQUID (superconducting quantum interference device), which is a high sensitivity magnetic sensor, is able to measure weak magnetic fields (magnetoencephalographs) generated by neurotransmissions (brain activity) without being obstructed by the skull. For example, using SQUID to take measurements of the area around a brain tumor that has been found through MRI, enables a more accurate ascertainment of its position and state. This not only gives the surgeon more information before an operation, but it can also be used to obtain informed consent regarding side effects after surgery.	2014/05/21
research	2011-0906-05	Life sciences	Natural marine chemical compounds as materials for drugs As a tool in chemical epigenetics	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Chemistry and Biochemistry	Samples of marine organisms: Over 1,500 species, including marine sponges, coelenterates, protochordates, echinoderms, and mollusks. A diverse range of sampling areas: Japan (Ryukyu Islands, coastal Kyushu, Izu Islands, Sado Island, coastal Sanriku, Kuril Islands), Micronesia, Vietnam. Natural marine chemical compounds: A library of new and already known natural marine chemical compounds. We are targeting the library of chemicals extracted from marine invertebrates to carry out screening for antibacterial and antimold chemicals, growth inhibitors that work on various cancer cells, chemicals that inhibit angiogenesis and various enzymes, cytotoxins, bacteria with resistance to multiple drugs, etc. Over 100 varieties of new chemical compounds that clearly stimulate biological activity have so far been identified.	2014/05/21
research	2011-0906-06	Life sciences	New anti-Leishmania agent	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Chemistry and Biochemistry	"Cristaxenicin A," a new chemical compound with anti-Leishmania properties	2014/05/21
research	2011-0909-05	Life sciences Manufacturing Technology	A durability testing device for stents and a method of evaluation	Professor Faculty of Science and Engineering Graduate School of Advanced Science and Engineering Cooperative Major in Advanced Biomedical Sciences	We developed a testing device that could accurately simulate the stress environment of the area where the stent is inserted. The development of a system that takes into account the application of stress in the form of a combined twisting and stretching force, and the mechanical properties of the blood vessel model, has enabled the standardized, comprehensive evaluation and tracking of deformation in stents of a variety of designs.	2014/05/21
research	2011-0909-06	Life sciences Manufacturing Technology	Acellularization of heart valves	Professor Faculty of Science and Engineering Graduate School of Advanced Science and Engineering Cooperative Major in Advanced Biomedical Sciences	One of the ways of prolonging the life of tissue valves is to not treat them chemically, and use acellular tissue from porcine heart valves. A unique method of microwave irradiation combined with a simulated in vivo environment (controlled surfactant flow and pressure through pulsation) leaves the tissue undamaged, enabling the creation of acellular tissue that retains high strength. We also have technology for cultivating human endothelial cells on the surface of acellular porcine heart valves, enabling transplants with even less chance of rejection.	2014/05/21
research	2011-0915-01	Life sciences	Intracellular molecular dynamic analysis	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	Using random scan two-photon excitation microscopy, we can measure the movement of intracellular molecules. In particular, the calcium ions (Ca ²⁺) and phosphoenzymes, receptors and other proteins involved in the synapse plasticity of neurons are the target for this analysis.	2014/05/21
research	2011-0915-02	Life sciences	Diagnostic method for chronic myeloproliferative diseases - method for quantitatively analyzing the JAK2 genetic mutation	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Life Science and Medical Bioscience	We have a method of quantitatively analyzing the JAK2 genetic mutation. Using a fluorescent probe, it is possible to diagnose cMPD quickly and accurately.	2014/05/21
research	2011-0915-03	Life sciences	New isolation and culturing method for microorganisms	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Life Science and Medical Bioscience	New high-throughput in situ culturing tools and isolation and culturing techniques for useful microorganisms in the environment. It is possible to apply these methods to environments such as in underground and in water and obtain many new bacteria in one go. Because mass transfer through a hollow-fiber membrane is possible, we can perform isolation and culturing while still in the natural environment. (See figure)	2014/05/21
research	2011-0915-04	Life sciences	New pharmacological effects of thalidomide on neurons	Faculty of Science and Engineering Graduate School of Advanced Science and Engineering	The enantiomers, derivatives and metabolites of thalidomide are being analyzed to determine the various mechanisms of action in neurons by which they cause differences in pharmacological effect.	2014/05/21

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research	2011-0930-01	Life sciences	Drug development based on collagen	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Chemistry and Biochemistry	●Supramolecular materials having collagen-like triple-helical structure●Library of collagen-like triple-helical peptides (approximately 800 types)●Screening methods for collagen biological polymer bonding inhibitor compounds: (establishment of 384-well plate, high-throughput screening system)	2014/05/21
research	2011-1027-01	Life sciences	Artificial red blood cell production method	Guest Senior Researcher (retired) Research Council (Research Organization) Organization for University Research Initiatives	Production method for artificial red blood cells with the hemoglobin that binds to oxygen encapsulated in a lipid membrane. Demonstrated benefits include: (a) No blood types, (b) viruses and other infection sources are removed, (c) stable at room temperature for at least two years, (d) broken down and excreted by the metabolic system even when given in large amounts, (e) uniformly dispersed in plasma, to supply oxygen to the peripheral tissues where red blood cells cannot reach, (f) is safe and has the same oxygen delivery effects as red blood cells as a resuscitative fluid to treat hemorrhagic shock.	2014/05/21
research	2011-1028-01	Life sciences	Elucidating the mechanisms of intrahepatic metabolism control and disease caused by its failure	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	We have findings about the central molecule involved in the low-oxygen response mechanism in cells, hypoxia inducible factor (HIF)-1. We discovered that failure in this response in hepatic parenchymal cells leads to the onset and development of alcoholic and non-alcoholic fatty liver. In particular, we clarified that failure of fatty acid metabolism control by HIF-1 is involved in the onset mechanism for alcoholic fatty liver disease. Research is also being extended into the involvement of HIF-2, the HIF isoform.	2014/05/21
research	2011-1031-01	Life sciences Manufacturing Technology	Biofeedback-type perception support robot technology for cognitive-neuro rehabilitation	Professor Faculty of Science and Engineering School of Creative Science and Engineering	Accumulation of developmental knowledge and clinical data on perception support robot technology (RT) to aid in the rehabilitation of hemiplegic patients. A mechanism devised for communicating the ground conditions under the paralyzed foot to the healthy side by a unit that displays pressure level, attached to the healthy side arm or back. By comparing the ground contact conditions on the paralyzed side, felt through the healthy side with the mistaken image of the whole body held by the patient, the patient can realize him or herself, the mismatch in body perception. With this new mechanism through which the robot draws out independence, brain plasticity is encouraged, making autonomous and efficient rehabilitation possible.	2014/05/21
research	2012-0319-01	Life sciences	Development of hemiplegic gait simulation tools for educational purposes	Professor Faculty of Science and Engineering School of Creative Science and Engineering	This project is drawing attention to the gaps between movement and sensation experienced by those with hemiplegia, such as the feeling of being unable to move even though the patient wants to move the body parts, or the feeling that body parts are moving on their own. The project is developing methods to allow those in good health to experience such subjective sensations in a non-invasive and safe way.	2014/05/21
research	2012-0712-07	Life sciences	Field Effect Transistor Sensor	Senior Research Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Applied Chemistry	Transistor-type sensing device fabricated using semiconductor microfabrication technology.	2014/05/21
research	2013-0130-03	Life sciences	Technology for screening anti-aging substances	Professor Faculty of Human Sciences School of Human Sciences	We have established a system of using cultured cells for screening and transgenic mice to examine and evaluate substances that have the equivalent effect in anti-aging as calorie restriction. Pro-longevity transcription factor binding sites (DFCR-RE: dwarfism and calorie restriction-response element) are incorporated into upstream regions of the reporter gene (secreted alkaline phosphatase) to indirectly measure the stimulation of transcription factors bound to these sites. We also carry out analyses with a focus on neuropeptide Y in the metabolic pathways of anti-aging effects.	2014/05/21
research	2013-0130-04	Life sciences	Deficient DNA damage response and progeria	Professor Faculty of Human Sciences School of Human Sciences	Through the functional analysis of multiple proteins involved in the copying, repair and recombination of DNA identified as being the genetic cause of progeria, we are carrying out research into the breakdown and accelerated aging of the mechanism that maintains genomic homeostasis through DNA damage stress.	2014/05/21
research	2013-0130-06	Life sciences	Voice synthesizing technology based on human vocal cords	Professor Faculty of Sport Sciences School of Sport and Sciences	Analyzing the mechanical and acoustic mechanisms in the generation of voice in communicationAnalyzing the feedback from the sense of hearing and touch to the vocal system, and elucidating the mechanism for generating the quality of voice in emotional or ill people.	2014/05/21
research	2013-0130-07	Life sciences	Preventing external injuries and rehabilitation centered on the knee joint	Professor (retired) Faculty of Sport Sciences School of Sport and Sciences	We are elucidating the mechanisms behind external injuries to the knee joint (ligament, hamstring muscle, etc.), and we have knowledge in diagnosis, treatment, rehabilitation and prevention.	2014/05/21
research	2013-0130-08	Life sciences	Evaluating sports equipment based on knowledge in sports medicine	Professor (retired) Faculty of Sport Sciences School of Sport and Sciences	Analyzing through observation of the dynamics of bones and joints using cineradiography, and evaluating making use of knowledge in sports medicineSports we target mainly are soccer (junior and women's), judo, basketball, rugby, golf, etc.	2014/05/21

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research	2013-0130-09	Life sciences	Elucidating the state of health problems centered on backaches, and proposing methods of prevention (exercise treatment)	Professor Faculty of Sport Sciences School of Sport and Sciences	We are elucidating the mechanisms behind injuries in the back region, including the spine and surrounding areas (hip joint, groin region, shoulder girdle), and we have knowledge in diagnosis, treatment and prevention. We target mainly swimmers (swimming, water polo, diving, synchronized swimming, etc.)	2014/05/21
research	2013-0130-10	Life sciences	Coaching skills based on body image research, and sports promotion activities based on them	Professor Faculty of Sport Sciences School of Sport and Sciences	We are measuring and analyzing brain activity during "body imaging" in which people recall movements without actual physical movement, and the gap between what people consider to be the ideal movement and reality. Noninvasive brain imaging and biomechanical measurements are carried out specifically on somersaults and kicking motions, motions that involve cutaneous sensations, and movements using tools.	2014/05/21
research	2013-0130-11	Life sciences	Analyzing sports skills	Professor Faculty of Sport Sciences School of Sport and Sciences	In batting and pitching, a variety of analyzing methods such as the use of full body motion capture and force plates to analyze physical performance, bat swings or ball spin, and precision measuring of hand and finger movements and visual cognitive motion are used to evaluate skills with a focus on reproducibility.	2014/05/21
research	2013-0130-12	Life sciences	The mechanism behind the transient and chronic effects of ischemia and related muscle contraction, and its applications	Professor Faculty of Sport Sciences School of Sport and Sciences	Mid-to-long-term and repetitive contraction of muscles in ischemia (KAATSU training) leads to (1) increased muscle strength along with muscle hypertrophy, equivalent to high strength, even when the motor strength is extremely low, and (2) an improvement in vascular endothelium functions. Furthermore, ischemia which causes muscle contractions (3) stimulates the neural activity of the MI over a short time, making it an effective and noninvasive method of triggering plastic changes for motor learning and rehabilitation.	2014/05/21
research	2013-0130-13	Life sciences	Sports and sleep	Professor (retired) Faculty of Sport Sciences School of Sport and Sciences	Regarding the effect of physical exercise on sleep at night, we carry out research into the kind of exercise that is appropriate for improving sleep. We carry out research into the potential of exercise in treating depression, to see if it can improve people's mood.	2014/05/21
research	2013-0130-14	Life sciences	The brain mechanism that handles operational errors and motor learning	Professor Faculty of Sport Sciences School of Sport and Sciences	The activity of the anterior cingulate cortex is measured from the error-related negativity. The process of learning through warnings and rewards is analyzed through brain waves, brain imaging, TMS (transcranial magnetic stimulation), eye-trackers, etc.	2014/05/21
research	2013-0130-15	Life sciences	Evaluation of comfort through measurement of brain activity	Professor Faculty of Human Sciences School of Human Sciences	By measuring blood flow in the brain in real time through optical topography (NIRS), we can provide an objective, numerical index of the state of comfort or emotions. This will assist in the search for more effective stimulatory conditions and designs.	2014/05/21
research	2013-0130-16	Life sciences	Ways to alleviate mood disorders through attention training	Professor Faculty of Human Sciences School of Human Sciences	Focusing on "rumination = repeated recalling of past events and being tormented by them," often seen in depression, we are developing a form of neurobehavioral therapy based on attention training to alleviate rumination. We can provide treatments that suit the symptoms of the patient through use of fMRI and optical topography to ascertain changes in associated brain regions.	2014/05/21
research	2013-0130-17	Life sciences	Interfaces that make use of the characteristics of cutaneous sensation	Professor Faculty of Human Sciences School of Human Sciences	Designing an information communicating device for the visually impairedAnalyzing the characteristics of a variety of tactile sensing such as differences in the surface area, the layer structure and hardness (Young's modulus), slipperiness, etc., and proposing devices that make use of these characteristicsAnalyzing the upper arm extension illusion caused by vibration stimuli.	2014/05/21
research	2013-0130-18	Life sciences	The development of facilities and equipment based on analyses of the motor functions of the legs	Professor Faculty of Human Sciences School of Human Sciences	Analyzing the effects of tactile paving and inclined obstacles on the walking of healthy people, the elderly and injured people (an examination of stress or danger of tripping while walking).Elucidating the mechanical properties of the structure of the foot (e.g., the arch) while walkingEvaluating and proposing ways to provide information to the visually impaired with a focus on the properties of floor material.	2014/05/21
research	2011-0908-01	Information	LSI design technology for integrated systems that realizes ultralow energy	Professor Faculty of Science and Engineering School of Fundamental Science and Engineering	We are implementing a generalized rule that remains consistent throughout higher and lower processes by creating an abstraction model based on new concepts of "strong coupling" and "weak coupling" in regard to the three factors of functional modules, memory, and control that make up LSI. We are also able to establish LSI design technology that achieves an "LSI synthesis algorithm that integrates high and low points of low energy" through mutual harmonization of the design process in accordance with the implemented rule, without adhering to traditional hierarchical design processes.	2014/05/21
research	2011-0908-02	Information	Elucidating the vulnerability of IC cards and establishing countermeasures	Professor Faculty of Science and Engineering School of Fundamental Science and Engineering	In the scan path design, "scan registers" are incorporated randomly into the LSI, so it was originally secret information that only the designer knew. We demonstrated that it is possible to decipher the cryptographic processing of LSI in IC cards by making use of the regularity of the outputted data order due to the fact that the relative positions of FFs (flip-flops) used in a scan chain remain unchanged despite them being connected randomly. As a result of this, we have succeeded in deciphering typical encryption standards that were thought to be impossible to crack, including the AES, RSA cryptosystem, and elliptic curve cryptography (ECC).	2014/05/21

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research	2011-0913-01	Information	System for the handwritten input of mathematical expressions: MathBox	Professor Faculty of Science and Engineering School of Fundamental Science and Engineering Department of Computer Science and Engineering	The symbols in expressions can be recognized using existing character-recognition techniques, but the recognition of expression structures is difficult, which caused a drop in the accuracy of expression recognition. Accordingly, the pattern of the structure is predicted and a space (=MathBox) is displayed in advance for the user to input the expression, through which the structure is easily recognized and accuracy increased. In addition, we have succeeded in simplifying the correction of misrecognitions by providing example symbols that could possibly be input in the specified space.	2014/05/21
research	2011-0913-02	Information	Creation of effective thumbnails based on handwritten notes	Professor Faculty of Science and Engineering School of Fundamental Science and Engineering Department of Computer Science and Engineering	When displaying lists, thumbnails are effective as details can be ascertained easily from an overview, but with handwritten data, the characters can become too small, resulting instead in an increase in time required. Therefore, reduced thumbnails are produced automatically using snippets extracted of only the important parts, by automatic recognition of expressions emphasized by underlining or capturing in a box, which are enlarged and matched with a diagram. The result allows easy comprehension of the gist of a thumbnail and an increase in search efficiency.	2014/05/21
research	2011-0921-02	Information	Method for speeding up simulations for assessing many-core performance	Professor Faculty of Science and Engineering School of Fundamental Science and Engineering	In many-core processors, parallelized programs are executed successively, and from the loops subject to sampling, an estimable interaction number for the entire execution cycle is specified within the scope of errors expected based on statistical techniques. By carrying out detailed simulations of only this interaction number, it is possible to estimate the execution cycle number with high precision in a short simulation time.	2014/05/21
research	2011-0921-03	Information	Parallelization of multimedia applications (MPEG2 encoders and decoders) by using the OSCAR compiler	Professor Faculty of Science and Engineering School of Fundamental Science and Engineering	By using parallelization on a macroblock level in the MPEG2 encoding process, and by using parallelization on a slice level as well as macroblock parallelization in slice processing, it is possible to decrease power consumption as well as improve speed.	2014/05/21
research	2011-0922-02	Information	Methods and equipment for detecting and visualizing level of attention in videos	Guest Researcher (retired) Faculty of Science and Engineering Waseda Research Institute for Science and Engineering	This invention involves a method for quantitating details on the viewer during playback, such as "what parts does the viewer tend to look at" and their "level of attention" (existing eye movement measuring devices are also used), and methods, equipment and systems for visualizing time-series statistical probability distribution information, then consecutively updating and delivering accordingly.	2014/05/21
research	2011-0928-01	Information	Highly efficient development technology for highly reliable software systems	Professor Faculty of Science and Engineering School of Fundamental Science and Engineering	In order to prevent trouble from occurring in advance, it is vital to improve reliability. Software development goes through multiple stages from basic design to installation, and reliability is gradually lost along the process. To counter this are efforts to improve the reliability of each stage by referring to previous development examples, patterning and extracting them to use in conducting formal inspections.	2014/05/21
research	2013-0130-01	Information	A note-taking support system for enhancing the feeling of participation in lectures by hearing impaired students	Professor (retired) Faculty of Human Sciences School of Human Sciences	● Research phase: Applied developmental research, research into practical application and commercialization. Digital pen technology called Anoto, developed in Sweden, and a presentation system (OpenSTAGE®) developed by Dai Nippon Printing Co., Ltd. have been used in the support technology. Related press release: http://www.waseda.jp/jp/news11/110804_ant.html	2014/05/21
research	2013-0130-02	Information	Bulletin board for notifying the location of people (DoormSNGR) (developed independently)	Professor (retired) Faculty of Human Sciences School of Human Sciences	● Research phase: Applied developmental research, research into practical application and commercialization. A bulletin board that allows easy, remote operation (during a meeting or while on a domestic or international business trip) through a smartphone to display the location, and the expected time of return.	2014/05/21
research	2013-0130-05	Information	Turning sports movies into a database, and automatic generation, operations analysis and strategy analysis of secondary movies	Professor Faculty of Sport Sciences School of Sport and Sciences	Sports movie databases that can be processed on computers (mainly soccer). Developing technology for automatic recognition of tournament movies and the movement of players, the ball, etc., kinematic analyses of hand and leg movements, developing statistical methods of predicting movement, developing skeletal models and skeletal muscle models.	2014/05/21
research	2011-0909-03	Environment	Techniques for separation and recovery of CO2 using lithium silicate	Professor Faculty of Science and Engineering School of Creative Science and Engineering	"Lithium silicate" (Li4SiO4), developed by Toshiba, is a solid absorption material that can be used repeatedly to absorb CO2 at 600° and release CO2 at over 800°. It has excellent properties, such as higher absorption speed in the presence of water vapor, the ability to separate and recover pure CO2 by thermal swing operation at around 200°, and absorption capacity as high as 30% of its own weight.	2014/05/21
research	2011-0909-04	Environment	Increase in thermal energy quality through chemical regeneration	Professor Faculty of Science and Engineering School of Creative Science and Engineering	While thermal energy can be obtained easily and in large volume, it is irreversible, making it difficult to maintain a high-exergy-rate state. To address this, we can use chemical regeneration. Exergy-lowering processes like vapor reformation and partial oxidation chemically draw out thermal energy at medium-to-low temperature, under which the exergy rate decreases, and through this, the possibility of restoring the high rate is created.	2014/05/21
research	2011-0909-01	Environment Nanotechnology / Materials	Organic light-emitting transistors	Guest Professor Faculty of Science and Engineering School of Advanced Science and Engineering	Construction of transistors rather than diodes, however, allowed large currents to flow and light-emitting phenomena to be obtained. By adjusting the oscillatory conditions, organic lasers become an attainable goal.	2014/05/21

type of seeds	number	field	title	researcher	summary	posted
research	2011-0909-02	Environment Nanotechnology / Materials	Manufacture of flexible transistors using inkjet methods	Guest Professor Faculty of Science and Engineering School of Advanced Science and Engineering	It is possible to fabricate organic transistors onto plastic substrates by the inkjet method, by using a solution in which single walled carbon nano-tubes are dissolved in an organic solvent as the ink.	2014/05/21
research	2011-0914-01	Environment	Ultra lightweight vehicle (ULV)	Professor Faculty of Science and Engineering	We have developed an ultra lightweight vehicle (ULV) based on the "more than a bicycle less than a vehicle" concept. By obtaining a registration number in the mini-vehicle category, this vehicle can be legally driven on public streets. At present, development of EVs is being furthered based on social demands, and the Multi-PM (Prime Mover) design concept has been introduced, assuming the use of compressed air, gasoline and hydrogen as energy sources. Another attractive characteristic is its appeal as a "regional revitalizing" business model in collaboration with local small-to-medium enterprises.	2014/05/21
research	2011-0914-02	Environment	Co-benefit based support system and program for environmentally conscious behavior	Professor Faculty of Science and Engineering	Differing from the traditional types of HEMS and BEMS, based on automated control of lighting and air conditioning, these are a support system and program for environmentally conscious behavior focused on the lifestyles and work-styles of the individual (resident, worker, etc.). We possess algorithms that allow the effective "visualization" of obtained measurement data, and information provision according to individual attributes (age, gender, etc.) and ease of implementation. It is also possible to incorporate these into existing products and link them with smart meters and more.	2014/05/21
research	2011-0914-03	Environment	Production and network for use of bio-oil from unused woody biomass	Professor Faculty of Science and Engineering	We possess knowledge of multi-energy supply which combines production techniques for bio-oil from woody biomass based on rapid pyrolysis, with gasification and bio-oilification (having reached the stage of practical use thanks to joint research with plant manufacturers). Other knowledge we have concerns distribution and storage of bio-oil according to its properties, and its combustibility. Furthermore, efforts to construct a network for its use, including the ideal for a system for provision of raw materials in cooperation with the forest industry are being implemented through a system of collaboration between industry, academia and the government.	2014/05/21
research	2011-0920-01	Environment	Accelerating environmental cleanup processes	Professor Faculty of Science and Engineering School of Creative Science and Engineering	Through detailed solid analysis techniques, including XAFS, and geochemical simulations involving surface complex models and reaction kinetics, it is possible to construct optimal processing processes and set conditions, according to the respective contamination conditions. In proposing an optimal process, we add preprocessing by special pulverization and separation techniques, improve the operation procedures, and reduce amounts of pharmaceuticals and sludge via metal recovery.	2014/05/21
research	2011-0920-02	Environment	Optimization of pulverization and physical separation technology by powder simulation	Professor Faculty of Science and Engineering School of Creative Science and Engineering	It is possible to use a certain type of powder simulation, the Discrete Element Method (DEM) to ascertain in detail, the positions and speeds of each particle in the apparatus, and collision energies between particles and between particles and the walls.	2014/05/21
research	2011-0920-03	Environment	Constructing a process for recycling valuable resources from waste	Professor Faculty of Science and Engineering School of Creative Science and Engineering	A low-environmental-load type valuable recycling process can be proposed, in which, after various types of pulverization are conducted as preprocessing, a number of separation methods are recombined, based on specific weight, electrical and magnetic properties, wettability, shape, color, X-ray properties, and physical/physiochemical properties according to target.	2014/05/21
research	2012-0217-01	Environment	Socio-scientific research into administrative processes of environmental policies	Professor Faculty of Science and Engineering Graduate School of Environment and Energy Engineering	Policies, statutes, environmental science and technology, public opinion, reports in mass media and interests are being examined in a unified manner, and the methods below used to conduct empirical analyses. Results have been obtained in research on themes relating to the administrative process for Japanese global warming policies since the adoption of the Kyoto Protocol, and resource circulation policies. Information can be provided and on-site investigations conducted into domestic policies in Japan.1. Doubts are to be discerned with respect to environmental policies and efforts.2. The social and economic frameworks enveloping the research issues are to be ascertained. (Sites are to be accessed and basic information collected. The structure of problems are to be checked. To this end, the statutes, basic scientific and technological features are to be learned and the governmental, administrative, social and economic situations are to be objectively analyzed and considered.)3. Research is to be framed and trimmed. (The focus of the research is to be narrowed down. The direction of access and framing of the research scope are to be set.)4. Research methods are to be obtained and their methodology set. (Information gathering methods, analysis methods (topic processing, etc.) are to be set and mastered.)	2014/05/21
research	2012-0301-01	Environment	Design process management technology for sustainable buildings	Professor Faculty of Science and Engineering School of Creative Science and Engineering	Analyzing the building design process using a DSM (Design Structure Matrix) and suggesting an optimized design allows the improvement of the current design process. Furthermore, it enables organization of the matters to be considered when introducing a new technology into a building, and the elimination of inefficient design processes such as send backs.	2014/05/21

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research	2012-0312-01	Environment	Development of environmental impact evaluation methods by the comprehensive ELP (Environmental Load Point) index	Professor (retired) Faculty of Science and Engineering Graduate School of Environment and Energy Engineering	ELP (Environmental Load Point) is an integrated index in LCA (Life Cycle Assessment), which was developed in these research seeds. The nine problems, "energy drain", "global warming", "ozone depletion", "acid precipitate", "resource consumption", "air pollution", "ocean & water pollution", "waste disposal problems" and "ecosystem effect" have been categorized into environmental impact areas and categories have been prioritized based on questionnaire surveys conducted by the panel. Using the category priorities as coefficients, an integrated index was developed to enable the assessment of environmental loads in different sectors using standardized units.	2014/05/21
research	2012-0312-03	Environment	Evaluating the amount of carbon storage in natural and artificial forests	Professor (retired) Faculty of Human Sciences School of Human Sciences	Results have already been obtained in estimating the carbon storage capacity of domestic forests in Japan and tropical rain forests abroad, and a methodology has been established for simple estimation of the biomass of plantations in tropical regions. Use of this knowledge enables estimation of the carbon storage capacity of forests.	2014/05/21
research	2012-0313-01	Environment	Environmental impact and policy evaluation centering on Asian countries	Professor Faculty of International Research and Education Graduate School of Asia Pacific Studies	There is a need to grasp each situation from every angle and develop solutions that will allow for the creation of sustainable societies in developing countries while safeguarding the environment. This project will propose methods from among those solutions that utilize the special characteristics of each region. One example of this can be seen in a past example of river water pollution measures in Indonesia. By conducting research related to problem points of decentralized environmental management systems and on the ideal for effective environmental policies, it was possible to work on the construction of relations between social actors, conduct discussion toward the creation of action plans for the improvement of environmental management systems, and make proposals toward action. A method was used to incorporate the various opinions of the community by organizing discussion into the following two formats. The method allowed for the selection of the appropriate discussion body for each topic and management of discussion. Round Table (RT) - A variety of opinions were incorporated through this organizational format, which brought together provincial governments, municipal governments, chambers of commerce, regional universities, environmental NGOs, and other groups with the objective of conducting participatory research engaging social actors - governments, corporations, and citizens - and building social environmental management capabilities. Steering Committee (SC) - this committee comprises the central government, chambers of commerce, the University of Indonesia, and other stakeholders, brought together to discuss the ideal for national systems and policies meant to support local initiatives.	2014/05/21
research	2012-0315-01	Environment	Evaluation of the global warming reduction functionality of forests	Professor (retired) Faculty of Human Sciences School of Human Sciences	This project will evaluate the global warming reduction functionality of forests within developing countries. The project will investigate the cause of deforestation and forest degradation and the impact of global warming, and implement measures aimed at realizing a low-carbon society.	2014/05/21
research	2012-0321-01	Environment	Micro heat pipes to turn nano fluid into hydraulic fluid	Professor Faculty of Science and Engineering School of Creative Science and Engineering	This project will improve heat conductivity by using a hydraulic fluid containing silver nano-particles in a micro heat pipe.	2014/05/21
research	2012-0614-01	Environment	Environmentally-conscious product and waste product business management	Professor Faculty of Commerce Graduate School of Commerce	This project proposes methodology to scientifically develop market analysis and product management methods for environmentally-conscious products, as well as the creation of new waste product processing businesses.	2014/05/21
research	2012-0619-01	Environment	A latent heat storage system	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	This project is for the creation of a latent heat storage system using thermal energy (heat in particular) set in motion along with transfers between liquid and solid states.	2014/05/21
research	2012-0619-02	Environment	System for the elimination and collection of substances in wastewater	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	This project uses crystallization phenomena for a system that disposes of and collects the targeted substances in a discriminating and safe way while making considerations for the characteristics of waste water, in that it has a low concentration of many materials.	2014/05/21
research	2012-0619-03	Environment	Technology for evaluation, exploration, and collection at final disposal of waste sites for urban mines	Professor Faculty of Science and Engineering School of Creative Science and Engineering	This technology elucidates the types and quantity of metals buried within final disposal of waste sites, as well as the presence of minerals, and specifies which metals would be beneficial to collect. The technology makes it possible to use electric detection to measure zones where metals are distributed.	2014/05/21
research	2012-0619-04	Environment	Energy-saving and low-cost purification material development using high-quality regional soil	Professor Faculty of Science and Engineering School of Creative Science and Engineering	Usage of volcanic soil as environmental purification materials.	2014/05/21

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research	2012-0625-01	Environment	Self-filling concrete using sea water and sea sand	Professor (retired) Faculty of Science and Engineering School of Creative Science and Engineering	This project developed self-filling concrete using sea water as mixing water, sand as aggregate, and a new admixture that can provide these materials with superior fluidity and appropriate viscosity (A high-performance AE water reducing agent with a one-pack type thickener containing salt).	2014/05/21
research	2012-0627-01	Environment	Proposal for an innovative problem solving method for the creation of product value	Faculty of Science and Engineering Graduate School of Creative Science and Engineering	This project proposes a method for valuable new product development plans and new business plans (through the theory of inventive problem solving [TRIZ]). This project proposes a new product development methodology that aims for radical innovation for the improvement of added-value in line with changes in society predicted for the next 5 to 10 years rather than aiming for continuous quality improvements for existing products (kaizen activities).	2014/05/21
research	2012-0629-01	Environment	Development of new coast defense structures resistant to tsunamis and high tide	Professor Faculty of Science and Engineering School of Creative Science and Engineering	In line with the rebuilding of coastline defense structures across the country as each location reaches its scheduled upgrade period, there is a need to shift the structural format used for coastal defense. This project proposes a new structural format that considers knowledge gained from the elucidation of damage mechanisms and the impact on the coastal environment.	2014/05/21
research	2012-1001-01	Environment	Realizing Thermal Comfort by Spot Air Conditioning and Personal Air Conditioning Systems	Professor Faculty of Science and Engineering School of Creative Science and Engineering	The purpose of our research is to evaluate the comfort level and intellectual productivity provided by personal air conditioning systems, which allow for individual adjustments of the air current. Specifically, we carried out an actual measurement study at offices that installed and are actually operating this air conditioning system, by setting different airflow conditions (adjustable and not adjustable). The results found that employees' satisfaction with the thermal environment was significantly higher and their comfort level increased when the airflow of personal air conditioning systems was adjustable. The study showed that spot air conditioning current, have potential for improving the comfort level of employees.	2014/05/21
research	2012-1001-02	Environment	Research on Concentration Control Methods for Indoor Chlorine Dioxide Gas	Professor Faculty of Science and Engineering School of Creative Science and Engineering	The objective of this research is the establishment of methods for controlling the concentration of chlorine dioxide gas by understanding the problems in the region of moderate concentrations of chlorine dioxide gas (in our research, from 0.1ppm to 3.0ppm) and proposing methods for its effective uses. A chlorine dioxide gas concentration lowering device was developed. In order to conduct a performance test using a 1m ³ chamber for various filters and to verify the effectiveness of the device, real space actual measurements were taken at actual office spaces that checked for reductions in chlorine dioxide gas concentrations after fumigation. Furthermore, activated carbon's capability to adsorb chlorine dioxide gas was measured. [Research Outcomes]1) Activated carbon as a high capability of adsorbing chlorine dioxide gas. 2) The amount of ventilation corresponding to the activated carbon filter condition was significant. The amount was particularly pronounced with the honeycomb activated carbon filter. 3) When the honeycomb activated carbon filter was used, increasing the air flow of the device lowered the portion of the amount of ventilation corresponding to the air flow of the device. However, the corresponding amount of ventilation increased. The study showed that increasing filter thickness increased the collection efficiency of chlorine dioxide gas for the air flow of the device. 4) We proposed a formula for predicting indoor chlorine dioxide gas concentrations when gas concentrations decline due to the device following fumigation. The formula assumes the use of a 30mm-thick honeycomb activated carbon filter as the device filter, and the following variables: relevant ventricular volume; air flow of the device; and device filter area.5) The results of the actual measurements taken in full-scale rooms showed the operation of the device lowered chlorine dioxide gas concentrations, and that the chlorine dioxide gas concentration lowering device was effective in real spaces.	2014/05/21
research	2012-1001-03	Environment	Creation of Energy Projections and Environmental Measures Scenario	Professor Faculty of Science and Engineering School of Creative Science and Engineering	A fact-finding survey was conducted of several office buildings that adopted summer energy-saving measures. The purpose of the survey was to explore sustainable energy-saving methods that would deliver high energy reduction effects without compromising productivity and comfort.[Research Outcomes]The survey found that the percentage of dissatisfied employees was smaller and that intellectual productivity could be better maintained when the lighting is decreased rather than when the temperature is raised, and that this measure significantly decreased electricity consumption. When implementing power-saving measures, it is believed that the electricity consumption amount can be decreased effectively without compromising the comfort level and productivity of employees by giving priority to saving electricity through lighting, installing desk lamps, and selecting appropriate power-saving approaches tailored to the attributes of employees who occupy the floor.	2014/05/21

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research	2012-1001-04	Environment	Scenario of Achieving Both Office Productivity and Economic Efficiency, and Energy Conservation	Professor Faculty of Science and Engineering School of Creative Science and Engineering	This study conducted an indoor environment study, employee behavior study, and questionnaire survey. Their objective was to observe the mutual relationship between intellectual activities and environmental factors that are demanded in workplaces of actual offices, and to gauge the effects of workplace environments of actual offices on employees. Furthermore, the study analyzed the mutual relationship between intellectual activities, employee behaviors, and workplace environments, and examined the environmental factors demanded of workspaces from the perspectives of intellectual productivity and energy conservation. [Research Outcomes] (1) Important employee behaviors were different for each intellectual activity. Respondents declared that knowledge creation requires diverse employee actions, such as divergent thinking, informal communication, and relaxing. (2) At the buildings which were studied, employees carried out active communication not only at meeting spaces, but also in the vicinity of their desks. (3) Results hinted the possibility that employees' level of satisfaction with the environment was affected by the physical environment as well as employees' expectations of the environment based on how long they will stay there and what they are doing. (4) The results found that the following environmental factors affected employees' level of satisfaction with the environment at the buildings examined in this study. Thermal environment: "warm/cold sensation"; "hotness of the building upon arriving at the office"; and "shutdown of air conditioning during overtime hours". Lighting environment: "natural daylight"; "brightness of task lighting"; and "brightness from window". Air quality environment: "poor air circulation"; and "dustiness". Sound environment: "noise"; and "quietness". Air environment: "diversity of space"; "accessibility"; and "size of space".	2014/05/21
research	2012-1001-05	Environment	Assessment of Comfort and Intellectual Productivity in ZEB Energy-Saving Buildings	Professor Faculty of Science and Engineering School of Creative Science and Engineering	Research is conducted on office buildings that are renovated to make them net-Zero Energy Buildings (ZEBs). Specifically, the effectiveness of the ZEB renovation work is examined by studying the changes pre- and post-renovation in the physical environment and employee satisfaction level.	2014/05/21
research	2012-1001-07	Environment	Research on the Thermal Environment of Comfortable Train Station Spaces	Professor Faculty of Science and Engineering School of Creative Science and Engineering	A measurement survey conducted in 2004-2006 took environmental measurements at four non-air-conditioned train stations in Tokyo and implemented a questionnaire survey to roughly 4,000 people. The results showed that the maximum acceptable temperature declared by more than 20% of the respondents in the summer was the standard effective temperature (SET*) of 32°C, and that the temperature exceeded this threshold limit in many time ranges. This threshold limit is higher than the maximum acceptable indoor temperature. The main factors attributed to hot train stations are weak air current and the considerable effects of the sun's rays, and proposals are being studied to address these factors. In the FY2011 study, a measurement survey was conducted at train stations at which a large commercial facility and an air conditioning system were installed inside the ticket gate. The results demonstrated that although the maximum acceptable temperature and comfort level in the summer were the same as non-air conditioned train stations, the lower limit of the comfort range was higher for train stations installed with air conditioning systems. The inflow of outdoor air could inhibit thermal environment control inside a train station. Therefore, detailed analyses are being carried out of the factors, and countermeasure proposals are being reviewed.	2014/05/21
research	2012-1001-08	Environment	Research on Semi-Volatile Organic Compounds (SVOCs) in Indoor Spaces	Professor Faculty of Science and Engineering School of Creative Science and Engineering	Our laboratory is developing a new nozzle to collect house dust, and carries out analyses of the concentrations of SVOCs in house dust. Measurements are taken not only at general residential homes, but also in various spaces, such as homes made of natural materials and kindergartens, in order to measure indoor SVOC contamination levels. Furthermore, the speed of SVOC emissions from indoor finishing materials is measured to study how much impact the speed of SVOC emissions from building materials has on the concentration of SVOC in house dust. A variety of such studies are being implemented for developing measures to deal with indoor SVOC contamination.	2014/05/21
research	2012-1029-02	Environment	Research into inorganic separation membranes	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	■ Compared to traditional processes that make use of phase changes such as cryogenic separation, the separation process through a zeolite membrane enables energy savings. As shown in Fig. 1, zeolite has a separation function that makes use of differences in molecular size and adsorptive power. We were the first in the world to develop an inorganic membrane that achieved separation at a molecular level, and we have continued our research in this area. We developed a practical method of forming a thin zeolite membrane on a porous support. We also developed a unique characterization method of evaluating the structure of their inorganic porous membranes and separation performance, a part of which we are trying to turn into products.	2014/05/21
research	2012-1029-03	Environment	Development of cleaning agents for water and soil using inorganic materials	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	We have highly economical insolubilization technology for treating polluted soil, and water treatment technology for dealing with all toxic metals.	2014/05/21

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research	2017-0223-05	Nanotechnology / Materials	Ultra-Thin Film Luminescence Sensor	Associate Professor Affiliated organization Waseda Institute for Advanced Study	● Luminescence sensor made from free-standing polymer nanosheets with the thickness of tens to hundreds of nanometers. ● Versatile fabrication by selecting sensor dyes (e.g., temperature, oxygen concentration). ● Ratiometric sensing of biological information.	2017/02/23
research	2017-0223-04	Nanotechnology / Materials	Operation of 3-D MEMS Micro Mirror by Single Superposed Driving Signal	Associate Professor Faculty of Science and Engineering School of Fundamental Science and Engineering	● By single driving apparatus, MEMS micro mirror is actuated in three resonant modes ● MEMS micro mirror is operated in 3-D by single superposed signal with the three resonant frequencies	2017/02/23
research	2016-1024-05	Nanotechnology / Materials	Development of Biosensing Technology for Food Safety	Research Council (Research Organization) Institute for Nanoscience & Nanotechnology	● Semiconductor-based biosensors can detect a small amount of target molecules in foods. ● We have developed a biosensing technology to determine the presence of anaphylactogenic food allergens.	2016/10/24
research	2016-1024-04	Nanotechnology / Materials	Monitoring Chemical Balance in Epidermal Barriers	Research Council (Research Organization) Institute for Nanoscience & Nanotechnology	● Detection of multiple chemicals in epidermal barriers from a smartphone ● Challenging to monitor stress hormones and small ions for healthcare. ● Accurate measurement method of skin pH within 10 sec	2016/10/24
research	2016-0204-01	Nanotechnology / Materials	Fabrication of carbon nanotube yarn with high functionality	太成 金 理工学術院	● CNT yarn was drawn from vertically aligned CNT array ● CNT composite yarn was developed by electrolytic plating ● Controlling of plating by changing plating condition ● Superior electrical conductivity (2.14×10^7 S/m)	2016/02/04
research	2016-0203-09	Nanotechnology / Materials	Microfluidic white organic light-emitting diode	直史 小林 理工学術院 基幹理工学研究科 電子物理システム学専攻	● Greenish-blue and yellow LOSs were applied as liquid emitters ● Integrated 60- μ m microchannels were fabricated ● Greenish-blue and yellow liquid emitters were alternately injected into the fine microchannels (Fig. 3) ● White light was generated with simultaneous greenish-blue and yellow emissions (Fig. 4 (a), (b))	2016/02/03
research	2016-0203-08	Nanotechnology / Materials	Boron-doped nanocrystalline diamond as a p-type transparent electrode	Professor Faculty of Science and Engineering School of Fundamental Science and Engineering	● Production method of the p-type conduction of high Boron-doped NCD with high transmittance and excellent electrical characteristic ● Achieving two layers which High Boron-doped NCD was grown on top of undoped transparent NCD with quartz substrate	2016/02/03
research	2016-0203-07	Nanotechnology / Materials	Vertically oriented graphite layers on diamond substrate	Professor Faculty of Science and Engineering School of Fundamental Science and Engineering	● Implant ions to diamond (100) surface at high temperature ● Interstitial carbon atoms diffuse to the diamond surface during the thermal treatment (1700°C, 2h) after implantation ● High density vertically oriented graphite layer was formed on diamond surface	2016/02/03
research	2016-0203-06	Nanotechnology / Materials	MOSFET on polycrystalline diamond	Professor Faculty of Science and Engineering School of Fundamental Science and Engineering	● We developed high breakdown voltage MOSFET with polycrystalline black diamond ● The device exhibits perfect modulation and good device characteristic pinch off and saturation region ● High voltage breakdown of 1824 V by black polycrystalline diamond	2016/02/03
research	2016-0203-05	Nanotechnology / Materials	The new interface measuring device using new plasmon sensor and raman scattering spectroscopy	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Applied Chemistry	● Molecular configuration at buried interface, i.e. solid / liquid, Chemical structure change of the atomic level, are simply measured in nanometer scale.	2016/02/03
research	2016-0203-04	Nanotechnology / Materials	Scanning Near-field Optical Microscope(SNOM)	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	● Spectroscopic evaluations with a nanometer spatial resolution are possible ● Extended from single channel measurements to multiplex measurements ● Wide spectral range with highly accurate measurements are achievable ● Applicable to opaque samples as well as transparent ones	2016/02/03
research	2016-0203-03	Nanotechnology / Materials	Generation of high power and broadband THz wave	Researcher Affiliated organization Waseda Institute for Advanced Study	● Intense broad band THz wave generation by electron beam ● Efficient THz generation by electron pulse tilting ● Suitable for THz spectroscopy ● Intense THz wave as much as THz camera detection	2016/02/03
research	2016-0203-02	Nanotechnology / Materials	Electronic devices composed of polymer nanosheets	Associate Professor Affiliated organization Waseda Institute for Advanced Study	● Flexible electronic devices mounted on free-standing polymer nanosheets ● Fabrication of conductive lines by inkjet printing of silver nanoparticles at room temperature ● Soldering-free packaging of electronic elements (e.g., LED) based on van der Waals interactions	2016/02/03
research	2016-0203-01	Nanotechnology / Materials	Light-driven Bending Crystals	秀子 小島 ナノライフ創新研究機構	● Crystals for light-driven actuator ● Photomechanical crystals replaced to shape-memory alloy ● Crystal machinery replaced to MEMS	2016/02/03

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research	2015-0424-01	Nanotechnology / Materials	Light-emitting Electrochemical Cells(LEC)	Researcher (retired) Faculty of Science and Engineering Graduate School of Advanced Science and Engineering	· Hybrid device of electrochemistry and electronics · Specially designed ionic liquids for LEC application · Simple solution process for low cost manufacturing	2015/04/24
research	2015-0303-09	Nanotechnology / Materials Energy	Power Generation Micro Device using Fe-Co Metal Alloy	Research Council (Research Organization) Institute for Nanoscience & Nanotechnology	· New Fe-Co based magnetostrictive material (Developer; Hirosaki Univ, Tohoku Univ, Tohoku Steel Co., Ltd.) · Vibrational power generating device with high electrical efficiency	2015/03/03
research	2015-0303-07	Nanotechnology / Materials	Ultra-low-loss Tapered Optical Fibers(TOFs) and Ultra-high-Q Microtoroidal Resonators	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	· The highest transmission measured for TOFs with an optimal shape is in excess of 99.7% with a total TOF length of only 23mm · Microtoroidal resonators to build on-chip cavity QED systems with very high quality factors	2015/03/03
research	2015-0303-06	Nanotechnology / Materials	Self-healing Metal Wire for Stretchable Devices	Associate Professor Faculty of Science and Engineering School of Fundamental Science and Engineering	· High conductivity, and high stretchability for electric wire · Selective healing of a crack on a wire by "self-healing" function	2015/03/03
research	2015-0303-05	Nanotechnology / Materials	Micro/Nano Device	Professor Faculty of Science and Engineering School of Fundamental Science and Engineering Department of Electronic and Photonic Systems	· Specialized micro/nano fabrication technologies · Devices for chemical/bio-chemical analysis · synthesis and single-cell (a virus, a DNA, an organelle) analysis	2015/03/03
research	2015-0303-04	Nanotechnology / Materials	Electroforming Technique using Self-assembled Monolayer(SAM) for Modified Nanopatterns	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Applied Chemistry	· Electroless NiP nanoimprinting mold replicated from Self-assembled Monolayer (SAM) modified Nanopatterns · Elaborately manufactured in nano size and complicated form	2015/03/03
research	2011-0906-01	Nanotechnology / Materials	Observing substances under a near-field optical microscope	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	Using a near-field optical microscope allows observation of the shape, as well as the color of substances in an estimated area of 10 to 100 microns squared.	2014/05/21
research	2011-0906-02	Nanotechnology / Materials Energy	The controlling of light energy with precious metal nanoparticles (plasmonic substances)	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	Using a near-field optical microscope allows the observation and visualization of the plasmon of plasmonic substances. Plasmonic substances demonstrate a variety of behavior through their interaction with light, the progress of which can be tracked in high time and spatial resolution.	2014/05/21
research	2011-0906-03	Nanotechnology / Materials Energy	Organic-air rechargeable batteries	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	We developed an organic rechargeable battery that uses air for the cathode. It can be recharged in a short time (a few seconds). Its capacity also remained almost unchanged through 500 charge-discharge cycles. An organic polymer material was used to replace the anthraquinone in the anode, to realize high energy concentration (221 mAh/g) through the multi-electron redox reaction.	2014/05/21
research	2011-0916-01	Nanotechnology / Materials	Large-scale molecular simulation	Professor Faculty of Science and Engineering School of Fundamental Science and Engineering Department of Electronic and Photonic Systems	By using "dynamic bond-type large-scale molecular dynamic methods" we are able to perform large-scale molecular simulations that even include chemical reactions.	2014/05/21
research	2011-0922-03	Nanotechnology / Materials	Development of electrode materials and electrolytes for secondary batteries	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	Manufacture of secondary batteries using Li ₂ S, formed using S as a byproduct of the petroleum refining process as the positive electrodes material.	2014/05/21

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research	2012-0307-01	Nanotechnology / Materials	Organic "soft" secondary batteries	Senior Research Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Applied Chemistry	Development of macromolecules (redox polymers) that have the ability to rapidly and reversibly accept and donate electrons, and can be handled stably even in air at room temperature.	2014/05/21
research	2012-0712-04	Nanotechnology / Materials	All Wet ULSI manufacturing process	Senior Research Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Applied Chemistry	This project proposes the creation of a barrier layer structure on top of a silicon substrate, low-k substrate, and polyimide substrate and then copper wiring after that. The project aims to confirm that it is possible to shrink barrier film made with electroless plating to a thickness of 6 nm. Success has been made in embedding copper in a fine trench and constructing a protective layer using electroless and electro-plating.	2014/05/21
research	2012-0712-05	Nanotechnology / Materials	Hard-gold film technology for the realization of low-resistance and high mechanical strength	Senior Research Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Applied Chemistry	This technology introduces carbon to hard AuNi film, making the structure of the film amorphous, and producing AuNiC film with greatly heightened abrasion resistance without lowering its electric resistance. A technology concerning the manufacturing of AuNiC film.	2014/05/21
research	2012-0712-06	Nanotechnology / Materials	Manufacturing of nano particle array substrates	Senior Research Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Applied Chemistry	This project proposes the creation of nano particle array technology in order to realize bit pattern media (BPM) in which chemosynthesis is used to assign one recorded bit per single electro-particle with particle sizes of a few nanometers. The diagram is a scanning electron microscope (SEM) image showing a substrate with a physical guide attached to it, to which chemically modified organic particles have been joined, with FePt nanoparticles lined up on top of that. The registered array grouping of particles is foamed on the surface of meniscus which rises when the dispersed solution in the particles is dried, so it is possible that regularly arranged particles are moving in different directions. As such, it is possible to create a large domain of arrayed particles fixed on the substrate, ranging from a size of 10 to several 100 nanometers. However, disorder can be induced within such a range. Extremely small differences in particle diameters make the movement power between particles unequal, which catalyzes disorder in each array. The physical guide serves the role of preventing such disorder and making the domain more robust.	2014/05/21
research	2012-0928-01	Nanotechnology / Materials	Uncovering Electric Properties for the Development of Practical Applications of Polymer Nanocomposites	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	Our laboratory is conducting the following research aimed at developing practical applications of polymer nanocomposites. · Controlling insulating and dielectric properties of epoxy resin nanocomposites by inorganic fillers · Development and fabrication of highly insulating and highly thermally conductive materials suitable for miniaturized power semiconductor module · Creation of magnetic and dielectric materials tailored to high frequencies	2014/05/21
research	2012-0928-03	Nanotechnology / Materials	Development of New Waveguide-mode Sensors	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	Our laboratory is developing new waveguide-mode sensors, believing that various substances can be detected and substance constants can be measured using waveguide-mode sensors that have sensitivity, portability, and maneuverability. It is expected that sensors that have never existed will be developed by combining electrochemical-type methods and optical methods of waveguide mode sensors. 1. Realization of an all-in-one automatic solution management device that can automatically manage additives, in addition to the basic composition of plating solutions 2. Realization of a sensor that can easily detect solutions with heavy metal content at levels of the environmental limit.	2014/05/21
research	2012-0928-04	Nanotechnology / Materials	Creation of Highly Functional Light Transmission Materials by Ion Irradiation	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	Our laboratory creates highly functional light transmission materials by ion irradiation. We succeeded in increasing the functionality of polymer optical waveguides, based on our observation that the refractive index increases by irradiating ions into fluorinated polyimide, a polymer material.	2014/05/21

type of seeds	number	field	title	researcher	summary	posted
research	2012-1019-01	Nanotechnology / Materials	Fabrication of Nanoparticle Phosphor Film and Solar Cell Applications	Professor Faculty of Science and Engineering Waseda Research Institute for Science and Engineering	Our laboratory made nanoparticle phosphors of several nm using the ball mill method. Transparent thin film with over 90% transmittance in all wavelength regions was fabricated using nanoparticle phosphors. Red phosphor transparent thin film that meets the following conditions is fabricated on the solar cell. (1) Short-wavelength light is converted to long-wavelength light (2) Long-wavelength light is transmitted as is (→using nanoparticles) The following two types of materials are used as red phosphors. · Sulfide phosphor Ba ₂ ZnS ₃ : Mn (BZS) · Nitride phosphor CaAlSiN ₃ : Eu (CASN) Research has long been conducted on sulfide phosphors. Our laboratory can turn sulfide phosphors into nano sizes of several nm by the ball mill method, and used them to fabricate transparent thin film with dispersing quality and high transmittance. Nitride phosphors have superior luminous efficacy and durability compared with oxides and sulfide phosphors. Accordingly, our laboratory is studying the conditions for turning nitride phosphors into nano sizes, and was able to obtain particles of several tens of nm that conduct wavelength conversion. We found that a transparent thin film was fabricated on the photodiode and that wavelength conversion was achieved in a short-wavelength light region.	2014/05/21
research	2017-0223-02	Energy	Development of Scalable Micro Thermoelectric Devices	Professor Faculty of Science and Engineering School of Fundamental Science and Engineering Department of Electronic and Photonic Systems	● Si nanowire is used as the thermoelectric material. ● Miniaturized TE device fabricated by the Si-LSI process capable of mass-production	2017/02/23
research	2017-0223-01	Energy	Research on High-efficiency Thin-film Solar Cell using Quantum Effect	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	● There exists a bandgap energy suitable for a single-junction solar cell. ● A superlattice structure (Fig. 2) produces a stable exciton (Fig. 3) using its quantum effect. ● A stable exciton absorbs solar light efficiently.	2017/02/23
research	2011-0920-04	Energy	Energy-saving and environmental techniques that use vapor compression heat pumps	Professor Faculty of Science and Engineering Waseda Research Institute for Science and Engineering	We have been conducting research and development into revolutionary energy-saving vapor compression and condensation (VCC) technologies that compress vapor produced in the evaporation process, and continually recover condensation latent heat to reuse in evaporation; the theoretical design is complete and prototype experiments have been performed. Furthermore, we are researching how to improve efficiency of small-scale vapor compressors that are the key to making this technology commercially viable.	2014/05/21
research	2011-0922-01	Energy	Development of energy control techniques for the realization of a smart grid	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Electrical Engineering and Bioscience	Advanced methodologies will be developed through computer simulations and next-generation smart grid simulations, in order to enable total design of a suitable next-generation electrical energy supply configuration by which both of the above can be achieved continuously.	2014/05/21
research	2012-0220-01	Energy	Technology that uses numerical calculation to elucidate the internal transport mechanism inside lithium ion batteries	Professor Faculty of Science and Engineering School of Creative Science and Engineering	Using a lithium ion battery for HEV (hybrid electric vehicle), designed using a general-purpose numerical calculation software program BDS (Battery Design Studio), simulations of "constant current experiments on actual equipment" can be implemented. From the charge/discharge curve, a basic property obtained by simulation, the battery's performance is efficiently and simply expressed, and they can be introduced into HEV simulators.	2014/05/21
research	2012-0312-02	Energy	Design and operation of smart communities / Eco-towns that are resistant to natural disasters	Professor (retired) Faculty of Science and Engineering Graduate School of Environment and Energy Engineering	Essential to the construction of local energy supply systems for using renewable energy, which is readily affected by the weather, is the technology ensuring a stable supply of power. In our laboratory, we are able to design, construct and evaluate local energy supply systems that provide stable power. By ensuring independent power, it is also possible to build a power structure that is resistant to disaster. The tools below can also support this effort as technological seeds; each of them can be applied to full-scale target systems. 1. Large-scale combinatorial problem optimization algorithms, 2. Flow analysis algorithms for large-scale distribution networks, including loops and PV nodes, 3. Algorithms for deciding the optimal installation location of solar panels in order to obtain the maximum power for the given site. 4. Multipurpose optimization algorithms for deciding on generated power in full-scale power systems. 5. Extended fast algorithms for large-scale dynamic planning methods for power source development in developing countries. 6. Charge and discharge control simulation support tools that take into account the running patterns of electric vehicles. 7. Optimal combination and capacity-deciding algorithms for smart grid power sources and batteries. 8. Construction and operation analysis algorithms for smart communities, for accommodating heat and electricity. 9. Pitch angle and battery control simulation support tools for easing the fluctuation in wind power output. 10. Energy system optimization algorithms for the construction of local-production-for local-consumption-based eco-cities led by the region.	2014/05/21

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research	2012-0313-02	Energy	Heat extraction rate maximized by the use of nanofluid in heat exchangers	Professor Faculty of Science and Engineering Graduate School of Advanced Science and Engineering	Mixing TiO ₂ nanoparticles into the media (water) inside a heat exchanger and conducting several hours of preliminary steam generator operation, causes the nanofluid to adsorb onto the inside of the heat transfer tube and a nanostructure to be formed. So doing increases the heat extraction rate.	2014/05/21
research	2012-0313-03	Energy	Design, production, and performance evaluation of environment-conscious electric vehicles	Professor Faculty of Science and Engineering Graduate School of Environment and Energy Engineering	This research laboratory has been developing electric buses and different types of electric vehicles up to this point. Research has progressed to the level of commercial use for electric buses in particular. Based on such findings, it is possible to conduct evaluations on the design, production, and performance of a variety of electric vehicles.	2014/05/21
research	2012-0712-01	Energy	Long-life negative silicon anode synthesis for next-generation lithium-ion batteries	Senior Research Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Applied Chemistry	This technology has successfully produced composite products merging silicon and organo-mineral complex substances at the micro-level through the simultaneous reductive decomposition of organic solvents and reduction of silicon. The resulting silicon on electrodes are composed of amorphous silicon made of oxygen and carbon that has been diffused at the nano-scale. Even after 7,000 cycles, this technology shows extremely superior output figures of approximately 800 mAh/g.	2014/05/21
research	2012-0712-02	Energy	Evaluating lithium-ion battery (LIB) cell degradation using an impedance measurement	Senior Research Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Applied Chemistry	This technology aims to establish a "usable" battery evaluation method for currently marketed LIBs using impedance analysis. While thinking about the structural aspects of the battery leading to such issues as electrolyte resistance, interface reactions between the batteries north and south poles, surface films, and ion diffusion within film and solid states, the project considers the minimum possible factors for degradation, installs an analogous circuit usable for the analysis of a wide range of frequency bands, and analyzes LIB capacity degradation based on the resulting impedance reactions. In addition, by carrying out impedance analysis under low temperature conditions, it is thought possible to conduct a correct analysis by using processes not admissible within a normal temperature range.	2014/05/21
research	2012-0712-03	Energy	Production technology development for the creation of a next-generation laminated lithium-ion battery	Senior Research Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Applied Chemistry	This technology makes it possible to supply 50 to 1,000 mAh next-generation laminated lithium-ion batteries. The laminated cells are constructed under laboratory conditions within a dry-air environment (supplied air - dew point at	2014/05/21
research	2012-0807-01	Energy Environment	Innovative Energy-Saving Technology Based on Heat Pumps	Professor Faculty of Science and Engineering School of Fundamental Science and Engineering	This technology is characterized by two principles. First, heat moves from hot things to cold things. Secondly, if gas is squeezed out all at once from a high-pressure area to a low-pressure area, then the gas is cooled rapidly. This technology is expected to have significant energy conservation potential depending on the operating conditions. Furthermore, with the development of smart systems, it will become important that optimal energy systems are operated with heat pumps forming the crux of the systems.	2014/05/21
research	2012-0903-01	Energy	Experiment Using High Quality Beams	Professor Faculty of Science and Engineering Waseda Research Institute for Science and Engineering	The Washio Laboratory conducts research on PEMFC. It is also working on the development of materials which can be used as an electrolyte membrane for a Polymer Electrolyte Fuel Cell (PEFC) that is capable of having a compact and light weight design.	2014/05/21
research	2012-0903-02	Energy	Uncovering the Initial Process of Radiation Chemical Reactions: Pulse Radiolysis Experiment	Professor Faculty of Science and Engineering Waseda Research Institute for Science and Engineering	The Washio Laboratory is developing the world's smallest pulse radiolysis system using a compact photocathode RF electron gun. At present, the laboratory has nearly completed the development of a nanosecond resolution system and picosecond resolution system. The nanosecond system is capable of directly measuring time behavior using an oscilloscope. Thus, many samples may be measured in a short timeframe, and combined with the picosecond system, the phenomenon can be followed in a broad time region.	2014/05/21
research	2012-0903-03	Energy	Maskless Direct Etching Technique Using Focused Ion Beams (FIB)	Professor Faculty of Science and Engineering Waseda Research Institute for Science and Engineering	This research attempts to carry out maskless direct etching using focused ion beams (FIB) in order to study the nanoscale microfabrication of cross-linked PTFE. An image of the fabricated microscopic structure FE-SEM is shown in a diagram.	2014/05/21
research	2012-0903-04	Energy	Development of Inverse Compton Scattering Soft X-ray Sources Using Photocathode RF Gun	Professor Faculty of Science and Engineering Waseda Research Institute for Science and Engineering	■Development of Inverse Compton Scattering Soft X-ray Sources Using Photocathode RF Gun In this research, compact and high quality soft X-ray sources are being developed using inverse Compton scattering, with the final goal of applying them to soft X-ray microscopes for biological observations. Inverse Compton scattering involves the creation of shorter wavelength light through the collision of high energy electrons and long wavelength light, and is the inverse process of the generally well-known Compton scattering. The Washio Laboratory is working on the development of high quality electron beam sources using a photocathode RF gun, as well as researching their applications. This research is one of the experiments for these applications. So far, the laboratory has succeeded in the preparation and detection of soft X-rays using inverse Compton scattering.	2014/05/21

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research	2012-1029-01	Energy	Synthesis of Ordered Porous Materials and Catalytic Chemical Applications	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	<ul style="list-style-type: none"> Research on micro- and mesoporous materials A precursor gel is once dried, and this is then crystallized in the vapor phase. The use of the DGC method allows the preparation of zeolites with structures and compositions not obtainable by the hydrothermal synthesis method. The Laboratory conducts research on the crystallization mechanism of zeolite by the DGC method. Using the DGC or hydrothermal synthesis method, the Laboratory searches for microporous crystals with new structures, assesses catalyst characteristics, ascertains the crystallization process, and develops a method for inserting heteroelements into the crystal skeleton. 	2014/05/21
research	2017-0223-07	Manufacturing Technology	Healing of Fatigue Crack in the Metallic Materials by Heat Treatment	Associate Professor Faculty of Science and Engineering School of Fundamental Science and Engineering	<ul style="list-style-type: none"> Implementation of fatigue crack healing of 90% Implementation of static tensile strength of 75% Fatigue crack healing due to elimination of oxide film by vacuum heating, plasticity-induced crack closure and atomic diffusion. 	2017/02/23
research	2017-0223-06	Manufacturing Technology	Direct Bonding of Dissimilar Materials Having 3D Nanostructured Interfaces	Associate Professor Faculty of Science and Engineering School of Fundamental Science and Engineering	<ul style="list-style-type: none"> Fabrication of nanospire structure (NSS) on aluminum surfaces Direct joining of CFRTP and Al by hotpress Improvement of adhesive strength by silane-coupling treatment 	2017/02/23
research	2017-0223-03	Manufacturing Technology Energy	Development of a Simple Fabrication Process for a Printable Piezoelectric Energy Harvest Device	Research Council (Research Organization) Institute for Nanoscience & Nanotechnology	<ul style="list-style-type: none"> A metal nanoink and a household printer is used for electrode fabrication and lamination method is used for assembly of the device Electric power of $1.12 \mu\text{J}$ was obtained 	2017/02/23
research	2011-0914-04	Manufacturing Technology	Manufacturing methods and improvement of mechanical properties for porous metals	Professor Faculty of Science and Engineering School of Fundamental Science and Engineering Department of Applied Mechanics and Aerospace Engineering	Manufacture of various kinds of aluminum alloy using the melt-foaming method (proposal for pore stabilization) Technique for strengthening porous metals by plastic working (rolling, extrusion, wire brushing, shot peening, etc.)	2014/05/21
research	2011-0922-04	Manufacturing Technology	Liquid crystal wide-angle fovea lenses	Guest Researcher (retired) Faculty of Science and Engineering Waseda Research Institute for Science and Engineering	We are currently working to develop liquid crystal wide-angle fovea lenses, by adapting elements using liquid crystal materials, whose refraction index can be controlled by an externally applied voltage, to enable changes in magnification and the position of the focus (single or multiple), while maintaining a 120 degree wide field of view. They are constructed from 1.5mm optical lenses (liquid crystal lens cells), and do not require mechanically moving parts.	2014/05/21
research	2012-0618-01	Manufacturing Technology	Life-cycle simulation technology for the realization of recycling-oriented production	Professor Faculty of Science and Engineering School of Creative Science and Engineering	This project creates life-cycle planning and life-cycle simulation technology in order to plan and evaluate entire product lifecycles, from design, production, specification, collection, and recycling, all in order to build in measures to reduce environmental burdens from the product planning and development stages.	2014/05/21
research	2015-1215-07	Social	Human-Robot Musical Interaction	Professor Faculty of Science and Engineering	<ul style="list-style-type: none"> Musical robots must be able to communicate with partner artists(Fig.2) Musical robots should recognize and send real-time non-verbal signals Sensor system for real-time non-verbal signals monitoring Multi-sensor: detects several signals at once (Fig.3) 	2015/12/15
research	2015-1215-06	Social	Human-Robot Laughter Interaction	Professor Faculty of Science and Engineering	<ul style="list-style-type: none"> Sensor system for real-time laughter monitoring(Fig.2) Wearable: non-invasive and portable Multi-sensor: measure all laughter-related body changes 	2015/12/15
research	2015-1215-05	Social	Development of a Wearable Motion Capture System for Balance Evaluation of Older Adults	Professor Faculty of Science and Engineering	<ul style="list-style-type: none"> Inertial Measurements Unit (IMU) motion capture system (Fig.1) One Leg Stance test with older adults (Fig.2) Automatic One Leg Stance segmentation (Fig.3) Auto-detection of gait abnormality (Fig.4) 	2015/12/15
research	2015-1215-04	Social	Development of Subliminal Persuasion System for Laparoscopic Training	Professor Faculty of Science and Engineering	<ul style="list-style-type: none"> Experimental setup and materials(fig.1) Different types of feedback(fig.2) The different between first trial and last trial(fig.3) Workload of each group during laparoscopic training(fig.4) 	2015/12/15
research	2015-1215-03	Social	A Robot Arm with Novel, Intrinsically Safe Joints	Associate Professor Faculty of Science and Engineering Graduate School of Creative Science and Engineering	<ul style="list-style-type: none"> Novel actuators with adjustable torque limiters Direct Teaching capability 7 DOF robot arm, 1m reach, 5kg payload 	2015/12/15

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research	2015-1215-02	Social	Small Sized Force / Torque Sensors for Robotic Arms and Hands	Associate Professor Faculty of Science and Engineering Graduate School of Creative Science and Engineering	● Novel 6-axis F/T sensor based on capacitive sensing ● Novel 3-axis force sensors for distributed tactile sensing	2015/12/15
research	2015-1215-01	Social	Ultrasonic Diagnosis Support Robot for Prenatal Care	Professor Faculty of Science and Engineering School of Creative Science and Engineering	● Online service : The obstetrician controls "Tenang" via teleoperation to see the ultrasonic images and diagnosis in real time. ● Offline service : "Tenang" moves automatically to get and send the fetus images. The obstetrician checks them by the image reconstruction system.	2015/12/15
research	2011-0906-04	Social	The creation of indexes for fostering green manufacturers and green consumers	Professor Faculty of Social Sciences School of Social Sciences	We implement a method of analyzing inter-industry relations in the evaluation of influence by corporate environmental activities on the environment from a wide range of perspectives. Furthermore, econometrics methods based on social statistics will be applied in order to evaluate and analyze the correlation between consumer behavior and the activities of corporations themselves, such as family budget surveys and industrial statistics surveys. Consideration will then be given to consumer satisfaction (usefulness index), production costs incurred by the company, environmental impact (the LCA-based CO2 emissions resulting from the manufacturing of that product), etc., at the same time, to determine what corporations should do and what kind of information they should publicize in order to reduce the CO2 emissions of society as a whole when faced with the difficult problem of choosing between whether to:1. Sell PET bottle beverages refrigerated or at normal temperature2. Promote the use of public transport or carsharing3. Build a new eco-house or renovate an existing one	2014/05/21
research	2011-0907-01	Social	Methods of quantitative evaluation and searching for industry-academia and inter-corporate alliances in research and development	Associate Professor (retired) Affiliated organization Waseda Institute for Advanced Study	We can analyze the influence inter-corporate collaboration has on the boosting of research and development capabilities using object data such as those taken from patents or academic papers. Using the results of analyses to select the coordinator that is most suitable for the issue at hand leads to the potential to establish a network among companies of different industries with the minimal amount of time, effort and money by making use of the coordinator's network.	2014/05/21
research	2011-0907-02	Social	Scientific analysis of the workflow in the production of animation and long-term human resources cultivation	Associate Professor (retired) Affiliated organization Waseda Institute for Advanced Study	Based on detailed ethnographic analyses of the workflow in the production process of animations at different companies, it is possible to recreate simulations of the individual processes. Based on this model, we will be able to give advice on division of labor from the perspectives of efficiency and long-term cultivation of human resources who engage in creating the contents of animations.	2014/05/21
research	2011-0921-01	Social	Change in population and society in Northeast China	Faculty of Social Sciences School of Social Sciences	In order to strengthen the competitiveness of the Chaoxianzu who live in Northeast China, as a people in the country, unique efforts are being made in terms of education in particular. At Yanbian University for example, there is much enthusiasm not only for Korean and Chinese but also for Japanese education. The rates of exchange studies and employment for its students in Japanese universities and companies is also high. For this reason, the region is characterized by the high educational level of the people first and foremost, and also for its pro-Japanese attitude. Information can be provided on the status of Northeast China (which is expected to develop in the near future), from the primary perspectives of ethnic education and changes in adaptation to society.	2014/05/21
research	2011-0929-01	Social	Earthquake reconstruction and protection of living heritage from the perspective of Islamic architectural history in India	Part-time Lecturer (retired) Research Council (Research Organization) Organization for Islamic Area Studies	We learned about the mapmaking in Bhadrashwar, Mundra, Kutch District in the state of Gujarat, India (plane table survey), its community classification under religion and the caste system, and the architectural assets remaining from an era when the region flourished through Indian Ocean trade. In the reconstruction support that followed the earthquake, the public were educated in order to understand the protection of living heritage and other buildings, and collaborative activities with Indian urban development enterprises have been implemented. There is also a personal network in the Indian Islamic world.	2014/05/21
research	2012-0928-02	Frontier	Uncovering Polymer Dielectric Properties in Terahertz Frequencies	Professor Faculty of Science and Engineering School of Advanced Science and Engineering	Our laboratory studies the electric and optical properties of dielectric materials. The types of dielectric materials we study are as follows: · Polymer research, electronic device research, applied optics research · Nuclear power and accelerator application research	2014/05/21
research	2016-0614-02	Life sciences	顎顔面マッサージロボット	Associate Professor Faculty of Science and Engineering Waseda Research Institute for Science and Engineering	顎関節症等の疾患に有効な顎顔面マッサージを行うロボットの設計ならびに制御に関する技術。この技術を用いることで、熟練した施術者が行うような力強さとしなやかさを兼ね備えたマッサージが可能。	2016/07/14

type of seeds	number	field	title	researcher	summary	posted
research	2014-0122-08	Life sciences Nanotechnology / Materials	光学顕微鏡を用いた局所温度測定	Part-time Lecturer (retired) Research Council (Research Organization) Organization for University Research Initiatives	・ポリマーナノ粒子型の蛍光ナノ温度計・ナノ粒子の直径は約100nm、位置決め精度は数nm、温度分解能は約0.3℃・カメラの速度に依存した高い時間分解能(数10ms~数10μs程度)	2014/01/31
research	2013-1022-06	Life sciences	クエン酸濃度の迅速測定法	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Applied Chemistry	・従来法(15分程)と異なり、数秒で測定可能・有機溶媒や高価な酵素を用いず、検出感度が高い	2013/10/25
research	2013-1022-05	Life sciences	機能性ペプチドの合成法	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Applied Chemistry	・非リボソーム型ペプチド合成酵素(NRPS)由来のモジュールやドメインを利用したジペプチド合成・特定アミノ酸に限定されないジペプチド合成技術	2013/10/25
research	2013-1022-04	Life sciences	海洋天然化合物	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Chemistry and Biochemistry	・海洋無脊椎動物は低分子化合物の宝庫・エビジェネティクス研究のツール	2013/10/25
research	2013-1022-03	Life sciences	生体内常在性物質による抗がん作用	Professor (retired) Faculty of Education and Integrated Arts and Sciences	・がん細胞に対して選択的に死滅・増殖抑制させる化合物Xを発見した・化合物Xは生体内に常在する物質であるため副作用がない	2013/10/25
research	2013-1022-01	Life sciences	コラーゲンをを用いる新規DDS	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Chemistry and Biochemistry	・ストレス性と高尿排泄性を持つ今までに無い薬物担体・抗原性が低く安定	2013/10/25
research	2013-1021-03	Life sciences	人工赤血球の新しい臨床応用	Guest Senior Researcher (retired) Research Council (Research Organization) Organization for University Research Initiatives	・人工赤血球(Hb小胞体)の製造法を確立・安全性・有効性の膨大なデータを保有・カプセル化により分子状Hbの毒性を回避	2013/10/25
research	2013-1021-02	Life sciences	諸物性がデザインできる“テララーメイド輸送体によるDDS”	Part-time Lecturer (retired)	・創薬とDrug Delivery Systems(DDS)を融合させるプラットフォーム・ナノ輸送体の物性デザインにより薬物動態を制御(独自の機能性脂質ライブラリーを使用)・新薬開発の加速、付加価値DDS製剤の創出	2013/10/25
research	2013-1021-01	Life sciences	高感度DOI-PET検出器	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Applied Physics	・画像診断用PET装置の解像度向上・ガンマ線の吸収位置「3次元」計測・磁場耐性の新しい半導体光センサー	2013/10/25
research	2013-1017-03	Life sciences	非侵襲的内出血抽出アルゴリズム	Professor Faculty of Science and Engineering School of Creative Science and Engineering	・救急医療における内出血検出(FAST)の感度向上・超音波画像処理に基づき血液貯留の疑義箇所を抽出する診断支援システムの構築	2013/10/25
research	2013-1017-02	Life sciences	モバイル端末操作型エコー遠隔診断ロボット	Professor Faculty of Science and Engineering School of Creative Science and Engineering	・遠隔地医師によるモバイル端末の操作で、救急搬送中の外傷患者の内出血の有無を診断可能・開発した操作アプリ・ロボット・通信技術を妊婦健診に活用することで新たなビジネスプランを創出	2013/10/25

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research	2013-1017-01	Life sciences	非侵襲メラノーマ診断支援システム	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Electrical Engineering and Bioscience	・非侵襲的方法によるメラノーマの早期発見・色素分子レベルの情報に基づく客観的かつ定量的な診断支援	2013/10/25
research	2012-1001-06	Environment	自動車室内の快適な温熱環境に関する研究	Professor Faculty of Science and Engineering School of Creative Science and Engineering	本研究では、非定常・不均一な温度環境下における快適性予測を目的とし、車室内乗員の詳細な生理量予測、快適性予測を試みている。夏季炎天下条件、冬季暖房条件に実車両を用いた被験者実験を実施し、予測精度の検証データを得ている。それらの結果を基に、体温調節数値モデルである人体熱モデルJOSの開発・改良に加えて、人体熱モデルJOSと数値流体解析CFD・放射解析との連成計算を行っている。	2012/10/01
research	2014-0122-07	Nanotechnology / Materials	異種材料の低温大気圧ハイブリッド接合技術	Research Council (Research Organization) Institute for Nanoscience & Nanotechnology	・配線金属と透明基板材料の150℃・大気圧雰囲気での混載接合（他材料接合事例あり） IEEE NANO ベストポスターペーパー賞、日刊工業新聞掲載（2013.10.25）、関連特許2件 など	2014/01/31
research	2014-0122-06	Nanotechnology / Materials	ナノインプリント技術を用いた高品質GaNテンプレート基板	Research Council (Research Organization) Institute for Nanoscience & Nanotechnology	・ナノインプリント技術によるナノサイズのマスクパターン転写技術 ・ドライエッチング技術によるELOに適したマスクパターン形成技術 ・HVP E技術によるGaN結晶成長技術（古河機械金属（株））・光学測定による結晶性/残留歪評価技術（金沢工業大学）	2014/01/31
research	2014-0122-03	Nanotechnology / Materials	EB-NILによる極微細構造体作製	Professor Faculty of Science and Engineering Waseda Research Institute for Science and Engineering	・省エネ・低コストでの微小部材作製方法・生体適合性に優れた微小部材・極限環境下で使用可能な耐薬品・耐熱・耐放射線性に優れたフッ素系微小部材	2014/01/31
research	2014-0122-02	Nanotechnology / Materials	新規なプラズモンセンサ及びラマン分光法を用いた界面計測技術	Professor Faculty of Science and Engineering School of Advanced Science and Engineering Department of Applied Chemistry	・表面プラズモンセンサと表面増強ラマン散乱を応用したラマン分光法による界面計測技術・新規なナノ構造の「反射型プラズモンセンサ」を開発・測定物に対応した自由なセンサ部の設計が可能・固液界面を深さ分解能0.1nm以下、非破壊での観察を実現	2014/01/23
research	2014-0122-05	Nanotechnology / Materials	ダイヤモンド半導体を用いた高信頼性電力素子	Professor Faculty of Science and Engineering School of Fundamental Science and Engineering	・550℃の大気中でも導電性が確保され、絶縁性が向上した保護膜の製造方法・表面を水素化したダイヤモンド基板上に2層の保護膜を形成することで実現	2014/01/23
research	2016-0614-01	Manufacturing Technology	医療手技訓練用ヒューマノイド	Associate Professor Faculty of Science and Engineering Waseda Research Institute for Science and Engineering	医師など医療従事者の訓練に用いる患者シミュレータに関する技術。アクチュエータによって1台のシミュレータでさまざまな患者を再現することや、センサによって手技を計測し評価することが可能。	2016/07/14
research	2018-0402-01	Frontier Manufacturing Technology	視知覚の数理学とその産業応用、特に各種画像処理技術、錯視、商用アートへの展開。	Professor Faculty of Education and Integrated Arts and Sciences	新井研究室では、人の視覚系が行っている脳内の情報処理を最先端の数学を使って研究し、更に画像処理、錯視（目の錯覚）、商用アートへの応用を行っています。また人の視覚を超えた超視覚システムの研究もしています。これまでに次のような発明をして、複数の特許を取得した。本研究の展開と産業応用に関する提案を歓迎します。これまでの主な成果は次のものです。錯視の数学的方法による生成技術とパッケージ利用 人の視覚に優しい画像鮮鋭化 視認し難い対象物を容易に視認できるようなエッジ検出 新しいFIRフィルタ設計技術 色の対比錯視のコンピュータによる再現と逆問題の解決	2018/04/26
research	2015-0303-08	Frontier Nanotechnology / Materials	極短電子線パルス発生装置	Researcher Affiliated organization Waseda Institute for Advanced Study	・高品質・極短電子線パルスを電子銃単体にて発生・高周波加速による小型かつ超高压電子線の実現	2015/03/03

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