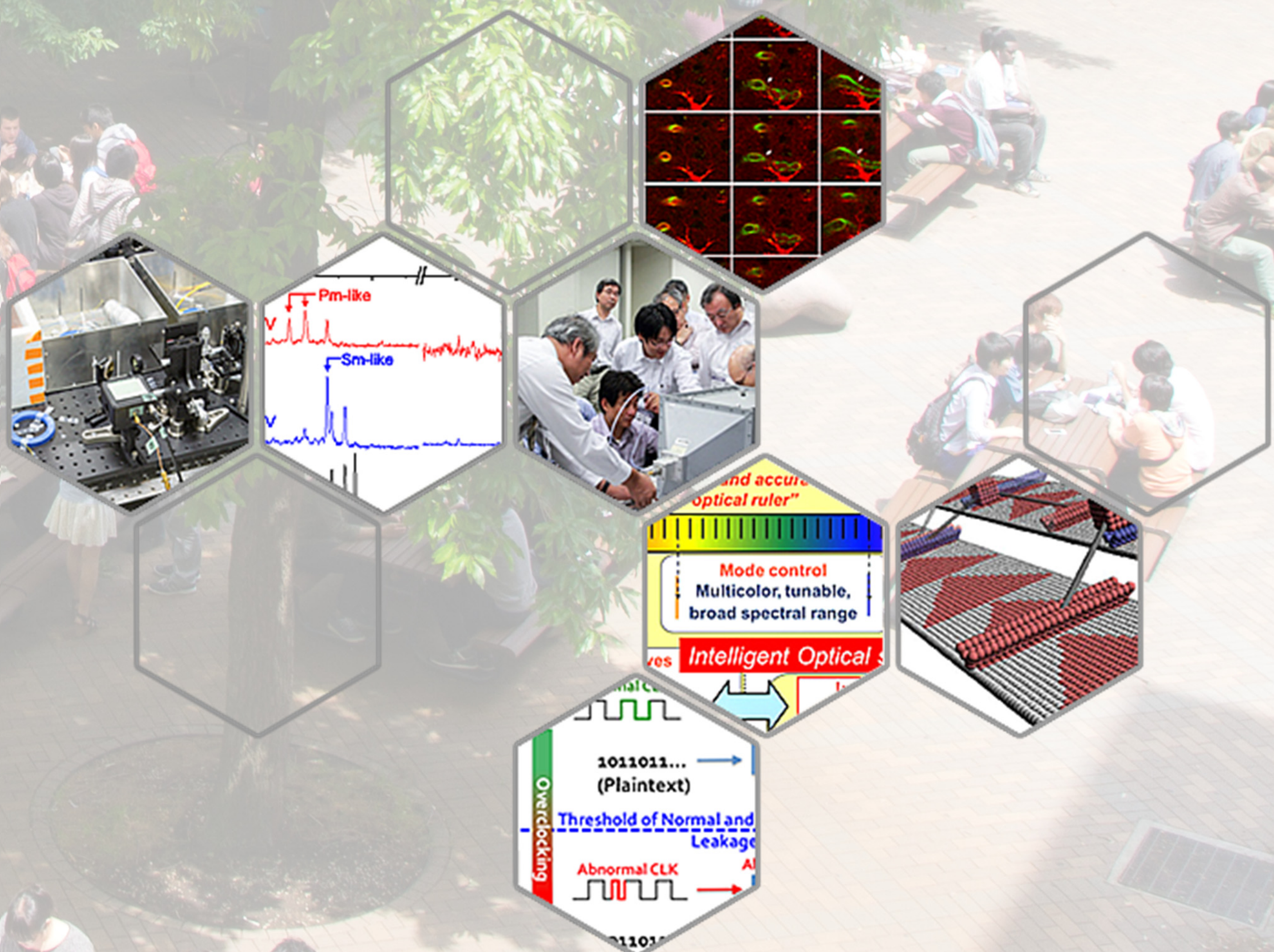
The University of Electro-Communications

UEC e-Bulletin

Updates on research, innovation, and events at UEC:
Unique and Exciting Campus in Tokyo

Vol.1, March 2014



The University of Electro-Communications 1-5-1 Chofugaoka, Chofu, Tokyo 182-8585

The University of Electro-Communications
UEC e-Bulletin Vol.1, March 2014

Feature

- Cutting edge research: An 'optical comb' for medicine, environment, astronomy, and other applications

News and Events

- A Small but Shining University : The University of Electro-Communications is selected for the Program for Promoting the Enhancement of Research Universities
- First International Moscow Institute of Physics and Technology--University of Electro-Communications Workshop (MIPT-UEC)
- Launch of the UEC ASEAN Research Center (UARC)

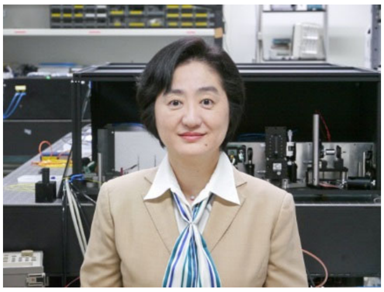
Research Highlights

- Bioimaging: Visualizing real-time development of capillary networks in adult brains
- Fusion Science: Heavy ions and lost resonance lines
- Molecular motors: Bubble-driven walking
- Data security: Unexpected information leakage from side channel

Topics

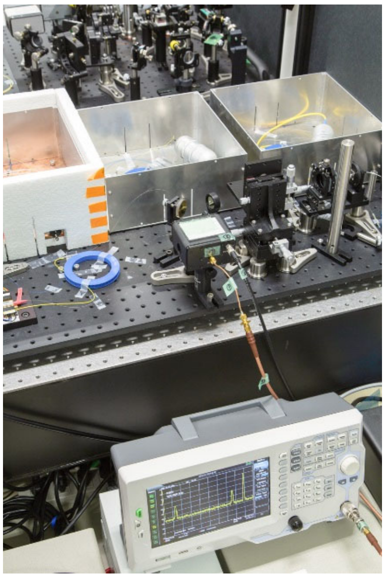
- UEC Aikido Club: Focus on flexible body and clear mind
- Gigabit Research Consortium
- Letter from Alumni

Cutting edge research: An ‘optical comb’ for medicine, environment, astronomy, and other applications

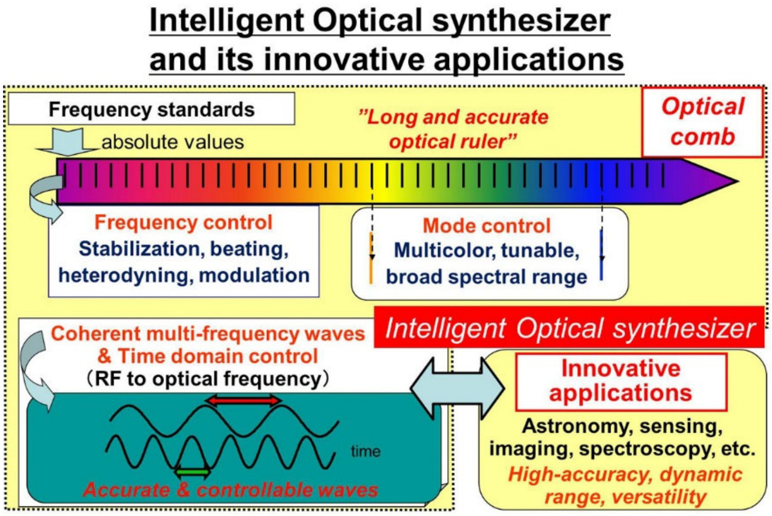


Kaoru Minoshima
Research Director of the ‘JST-ERATO MINOSHIMA Intelligent Optical Synthesizer Project’
Department of Engineering Science, Graduate School of Informatics and Engineering, UEC

“In spite of the tremendous advances in laser and optical communications, we still have not harnessed the potential of light and optical waves,” says Professor Kaoru Minoshima. “Light waves could become an ‘intelligent fundamental entity’ if we could control and exploit the time, phase and frequency information of light.”



The core of the JST-ERATO project is the concept of an ‘optical frequency comb’ that was the basis for the 2005 Nobel Prize in physics. The ‘optical frequency comb’ is the optical spectrum of a stable light source such as a laser, where the peaks are equally spaced in for example, a power density (ordinate) versus frequency (abscissa) plot. An ‘optical frequency comb’ can be produced by monitoring the continuous pulses of light from a laser and converting the light to frequency over time. The result will be highly discrete frequencies along the time axis corresponding to the ‘teeth’ of a comb. Now, one application of an ‘optical frequency comb’ is an optical ruler.



"Applications of 'optical frequency combs include metrology, such as an optical ruler, optical atomic clocks, imaging, astronomy and spectroscopy," explains Minoshima. "One of the main objectives of this project is to develop an 'intelligent optical synthesizer' by integrating state of the art electronics and optical technology." Specifically, the project will develop an intelligent light source enabling the control the properties of light including time, frequency, phase, and polarization.

"I think that the 21st century may be the 'age of light'", says Minoshima. "I hope that this project will make significant contributes to this field. I am looking for young, motivated scientists to join me for this project."

Minoshima Laboratory at UEC
http://www.femto-comb.es.uec.ac.jp/en/index_e.html

JST-ERATO MINOSHIMA Intelligent Optical Synthesizer Project
http://www.jst.go.jp/erato/minoshima/en/index_e.html

A Small but Shining University : The University of Electro-Communications is selected for the Program for Promoting the Enhancement of Research Universities

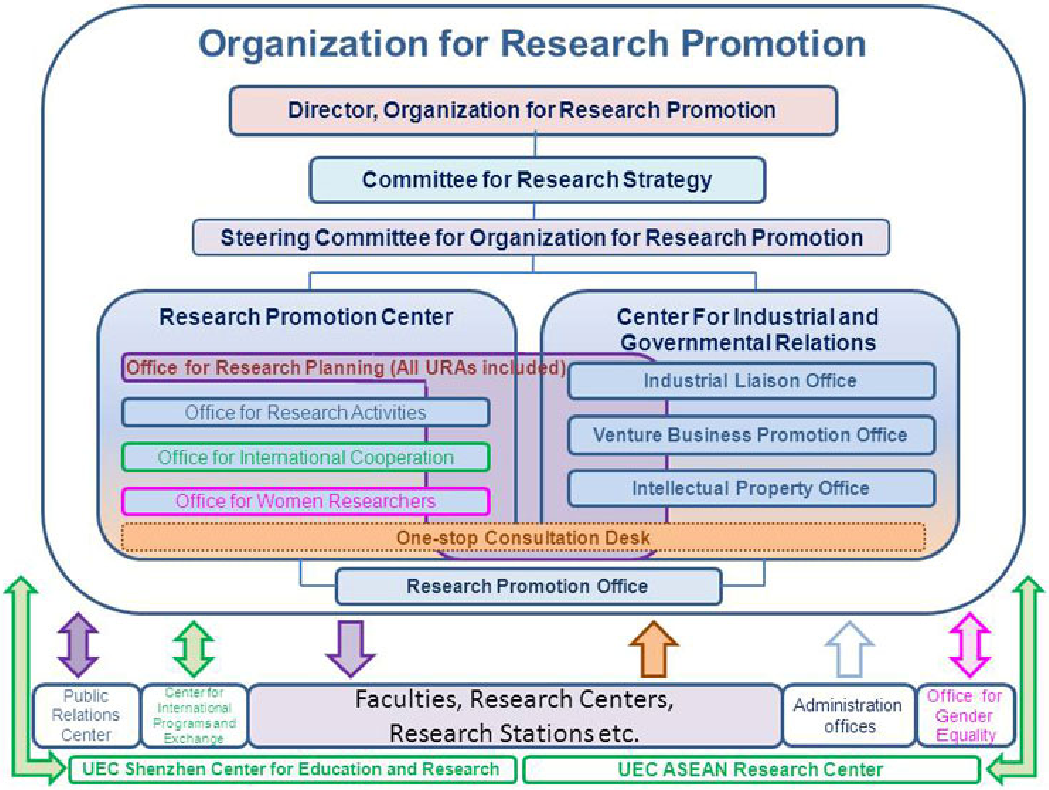
"The Program for Promoting the Enhancement of Research Universities" focuses on the overall academic research functions of universities and other institutions. It is a project launched by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) in fiscal 2013 to support the strengthening of research capabilities of universities engaged in highly advanced, world-class research activities.

The Program supports the implementation of initiatives to effectively combine specialized research environment reforms (such as the hiring and use of research management personnel, who are responsible for research strategy and intellectual property management including university research administrators (URA)); promotion of efforts to accelerate competitive research; creation of new cutting-edge fields of research; and development of a world-class research environment.

UEC was selected by MEXT as one of 22 institutions for support in FY 2013. It was selected for several reasons including:

1. The active research being conducted by its young scientists and engineers
2. International partnerships and many joint research projects being conducted with overseas researchers
3. Excellent results produced in the fields of optics and photonics
4. Active inter industry-business-academia partnerships
5. University reforms being promoted in accordance with a management strategy that takes advantage of the strengths of a small university.

UEC has established the Organization for Research Promotion to strengthen its research capabilities and enable it to become a leading center for world-class research. This will be achieved by adopting a comprehensive approach to planning and implementation of policies to promote vigorous, state of the art research, as well as provisions of support for research activities.



UEC is striving to be a “Small but Shining” university, and developing three management strategies that have been promoted under the leadership of the university president:

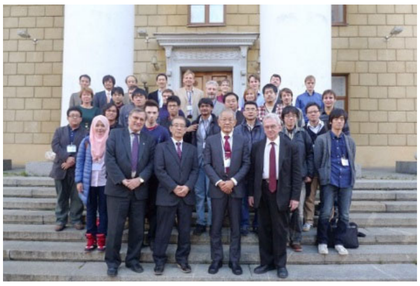
1. Borderless knowledge
2. Alliance and cooperation
3. Openness and transparency

It is also developing its research promotion structure by analyzing the status of its research activities and strengthening its graduate school, as well as by strengthening its efforts to recruit world-class talent and improving its level of internationalization.

An analysis of UEC’s research activities has revealed that research findings in the field of physics were ranked among the most impressive in the world, with distinctive results having been produced in other fields as well.

First International Moscow Institute of Physics and Technology—University of Electro-Communications Workshop (MIPT–UEC)

The first International MIPT—UEC Workshop (Moscow Institute of Physics and Technology, Moscow, Russia and University of Electro-Communications,Tokyo) on “Atomic, molecular and optical physics’’ was held at the Lebedev Physical Institute of Russian Academy of Sciences from 30th October to 1st November, 2013. The Workshop was held as part of a framework of international cooperation between the Moscow Institute of Physics and Technology (MIPT) and the University of Electro-Communications (UEC).



Members in front of Conference Hall

The principal participants in this workshop were 7 professors and 12 students from UEC and 8 professors and 9 students from MIPT. After representatives from the two universities presented overviews about their institutes, there followed presentations and discussion on atomic and molecular and optical physics and related fields.

Snapshot of the workshop of MIPT

The UEC delegates visited the laboratory of Dr. Kolachevsky who, prior to this workshop, had given a series of lectures on quantum electronics at UEC as part of an intensive course on applied physics in September 2013.

The students from both universities engaged themselves in lively discussions on physics and a wide range of other topics. Although the visit was only three days long, the UEC delegation enjoyed the hospitality of MIPT and had a very fruitful time. The UEC−MIPT Workshop II is scheduled to be held at UEC in the autumn of 2014.

UEC delegates visiting Prof. Kolachevsky Lab.Kolachevsky Lab.KMUTT

Launch of the UEC ASEAN Research Center (UARC)

The University of Electro-Communications (UEC, Tokyo) established the UEC ASEAN Research Center (UARC) with the cooperation of King Mongkut's University of Technology Thonburi (KMUTT)--UECs partner university--as the center of UECs activities in Thailand and other Southeast Asian countries. UEC held the inauguration ceremony of UARC on February 7, 2014 at the UARC in Bangkok CODE Building. Delegations from UEC, KMUTT and Megurokai (UEC Alumni Association) participated in the ceremony. The opening ceremony followed the following procedure.

Gift exchange between UEC and KMUTT

1. Opening address by UEC President, Dr. Makoto Kajitani
2. Address by KMUTT President, Dr. Sakarindr Bumiratana
3. Presentation of the letter of appointment as UEC visiting professor to Dr. Kosin Chamnongthai, Associate Professor of KMUTT
4. Exchange of commemorative gifts between UEC and KMUTT
5. Introduction of the participants
6. Unveiling ceremony and group photos

UARC is going to take an active role in the coordination of research collaboration with local universities and enterprises which includes accelerating exchange of students in Thailand and other Southeast Asian countries.

Bioimaging: Visualizing real-time development of capillary networks in adult brains

The advancement of microscopic photoimaging techniques has enabled the visualization of real-time cellular events in living organs. The brain capillary network exhibits a unique feature that forms a blood-brain barrier (BBB), which is an interface of vascular endothelial cells that control the traffic of substances from the bloodstream into the brain. Damage and disruption to the BBB are implicated in contributing to the pathogenesis and progression of neurodegenerative disorders such as Alzheimer's and epilepsy. However, the cellular interactions present in the BBB are incredibly difficult to study *in vivo*, so understanding of these mechanisms in living brains is limited.

Now, Kazuto Masamoto and co-workers at the University of Electro-Communications in Tokyo, National Institute of Radiological Sciences, and Keio University School of Medicine, have used 4D live imaging technology to study the effects of hypoxia (a deprivation of oxygen) on the BBB plasticity in live adult mice.

The team focused their attention on how the BBB plastic changes work against hypoxia, looking in particular at the endothelial cells and their communications to the neighboring astrocytes - interactions which take place in controlling the BBB traffic to fulfill neural demands. Using genetically-modified mice with endothelial cells that express green-fluorescent protein, Masamoto and colleagues imaged the real-time changes of BBBs before and during a three-week period of hypoxia in adult mouse cortex.

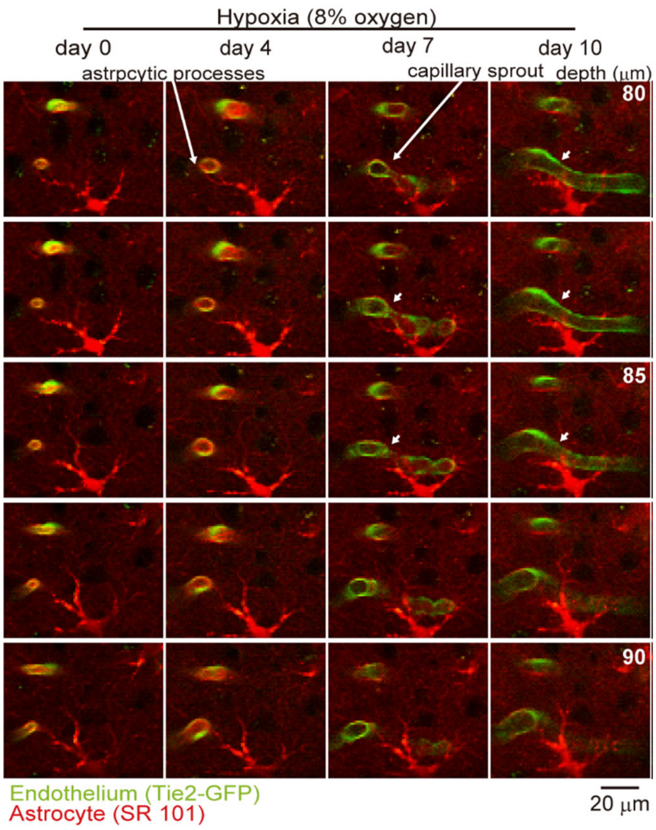
Their results showed that the capillaries in the BBB, which prior to hypoxia showed no signs of activity, began to sprout new blood vessels which in places formed new networks together. The neighboring astrocytes reacted quickly to wrap the outside of the new vessels, activity which the researchers believe helps stabilize the BBB traffic and integrity.

Further investigations into the molecular mechanisms that control BBB plasticity are expected to lead to advances in treatment of neurodegenerative disorders and cerebral ischemia, and thus provide an effective way for preventing BBB dysfunction in diabetes, hypertension, and aging.

Publication and Affiliation
Kazuto Masamoto[1,2,*], Hiroyuki Takuwa[2], Chie Seki[2], Junko Taniguchi[2], Yoshiaki Itoh[3], Yutaka Tomita[3], Haruki Toriumi[3], Miyuki Unekawa[3], Hiroshi Kawaguchi[2], Hiroshi Ito[2], Norihiro Suzuki[3] and Iwao Kanno[2].
Microvascular sprouting, extension, and creation of new capillary connections with adaptation of the neighboring astrocytes in adult mouse cortex under chronic hypoxia.
Journal of Cerebral Blood Flow & Metabolism 34, 325-331 (February 2014) | doi:10.1038/jcbfm.2013.201
http://www.nature.com/jcbfm/journal/v34/n2/full/jcbfm2013201a.html

1. Brain Science Inspired Life Support Research Center, University of Electro-Communications, Chofu, Tokyo, Japan
2. Molecular Imaging Center, National Institute of Radiological Sciences, Inage, Chiba, Japan
3. Department of Neurology, School of Medicine Keio University, Shinjuku, Tokyo, Japan.

*e-mail address: masamoto@mce.uec.ac.jp



Scientists at the University of Electro-Communications in Tokyo, National Institute of Radiological Sciences, and Keio University School of Medicine, have revealed how the blood-brain barrier (BBB) reacts to oxygen deprivation (hypoxia) in adult mouse brains. 4D imaging with multi-photon microscopy revealed sprouting of the new capillary (green) which stimulate adaptive changes of the neighboring astrocytic processes (red), as shown above.

Fusion Science: Heavy ions and lost resonance lines

Identifying the ns-np resonance lines in alkali-metal-like ions is an important issue in fusion plasma science in the view of spectroscopic diagnostics and radiation power loss. Whereas for n = 2, 3 and 4 these resonances are prominent and well studied, so far no one could clearly identify the resonance lines for n = 5, the so-called promethiumlike sequence.

Nobuyuki Nakamura at the Institute of Laser Science of the University of Electro-Communications in Tokyo, and colleagues at the National Institute for Fusion Science and SOKENDAI have now experimentally clarified the reason for the lost resonance lines.

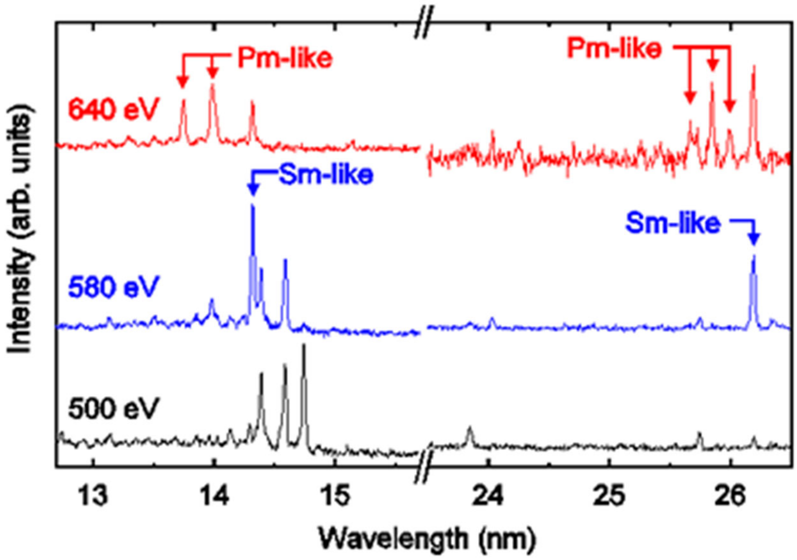
Nakamura and colleagues studied highly-charged bismuth ions using the electron-beam ion trap at The University of Electro-Communications in Tokyo. A compressed high-density electron beam ionizes the bismuth atoms that are then trapped by a combination of applied electric fields and the attraction force exerted by the electrons. The trapped ions keep colliding with the beam which leads to further ionization and the creation of highly-charged states like promethiumlike bismuth missing 22 electrons, or samariumlike missing 21 electrons.

The spectra are recorded with a spectrometer and compared to numerical calculations. Nakamura and co-workers show that the 5s-5p resonance lines are very weak in plasma with various electron densities, contrary to the theoretical prediction made more than thirty years ago, due to the presence of a long-lived metastable state.

Publication and Affiliation

Yusuke Kobayashi[1] Daiji Kato[2,3] Hiroyuki A. Sakaue[2] Izumi Murakami[2,3] and Nobuyuki Nakamura[1]. Spectroscopic study of promethiumlike bismuth with an electron-beam ion trap: Search for alkali-metal-like resonance lines. *Phys. Rev.* **A 89**, 010501(R), (2014).

1. Institute for Laser Science, The University of Electro-Communications, Chofu, Tokyo 182-8585, Japan
2. National Institute for Fusion Science, Toki, Gifu 509-5292, Japan
3. Department of Fusion Science, The Graduate University of Advanced Studies (SOKENDAI), Toki, Gifu 509-5292, Japan



Experimental spectra of highly charged bismuth ions at different electron energies. Promethiumlike and samariumlike spectral peaks are identified.

Molecular motors: Bubble-driven walking

Computer simulations of relatively simple models provide clues to the complex physical mechanisms at work in real biomolecule motors.

The asymmetric Brownian ratchet model describes a motor particle moving on a rail (for example a protein like kinesin walking a on a microtubule). There are two possible states: in one the particle moves in a random walk along the rail; in the other it feels the asymmetric potential from the rail. Alternating between these two states leads to a directed movement.

A collaboration including the University of Electro-Communications, Keio University, RIKEN, University of Fukui and University of Nebraska-Lincoln led by Noriyoshi Arai previously suggested that the transition between the two states is caused by bubble formation. Arai and co-workers have now refined their model including a more realistic temperature-controlled switching mechanism.

In their model the two states of the asymmetric Brownian ratchet are a hydrophobic 'bubble state' and a hydrophilic 'liquid state'. In the former, the motor is close to the rail, bubbles form due to the hydrophobic effect and the motor feels an asymmetric potential. In the latter, the motor is far from the rail and due to thermal fluctuations it moves randomly along it. The switching between the two states is caused by the change of hydrophobic/hydrophilic parameter of the motor controlled by the temperature of the motor itself.

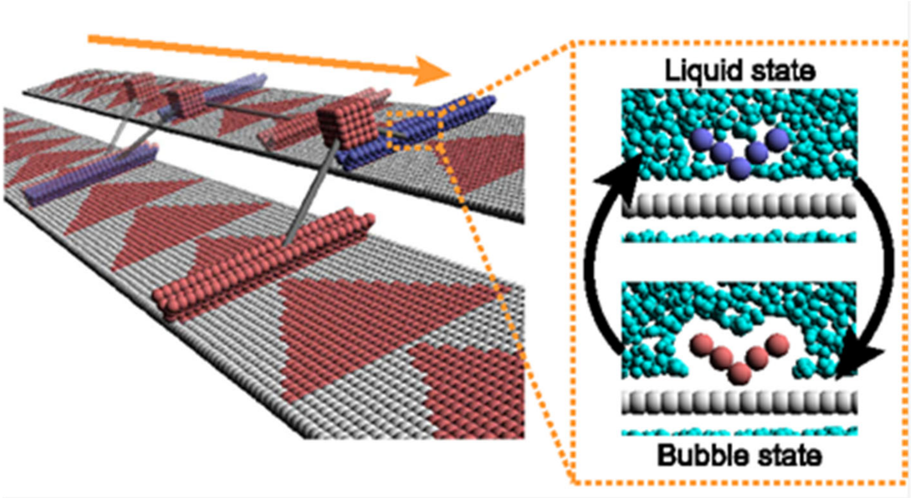
As computer simulations indicate, the mechanism proposed by Arai and collaborators could lead to very efficient walking depending on the material used for the motor, for example thermosensitive polymers.

Publication and Affiliation

Noriyoshi Arai[*1,2,3], Kenji Yasuoka[2],Takahiro Koishi[4], Toshikazu Ebisuzaki[3], and Xiao Cheng Zeng[5].
Understanding Molecular Motor Walking along a Microtubule: A Themosensitive Asymmetric Brownian Motor Driven by Bubble Formation. *J. Am. Chem. Soc.* **135**, 8616−8624, (2013).

1. Department of Mechanical Engineering and Intelligent Systems, University of Electro-Communications, Chofu, Tokyo, Japan
2. Department of Mechanical Engineering, Keio University, Yokohama, Japan
3. Computational Astrophysics Laboratory, RIKEN, Wako, Saitama, Japan
4. Department of Applied Physics, University of Fukui, Fukui, Japan
5. Department of Chemistry, University of Nebraska-Lincoln, Lincoln, Nebraska, United States

* Corresponding Author arai@mce.uec.ac.jp



A computer simulation of the motor-rail system. The walking mechanism is explained by the alternation between the bubble and the liquid state.

Data security: Unexpected information leakage from side channel

In this high-technology age, finding ways to prevent information leakage via device hacking is increasingly important. In order to pre-empt attacks, researchers carry out false attacks on encrypted devices to find weaknesses that may be exploited in order to implement safeguards.

In particular, so-called "side-channel attacks" are used to collect data on emissions from circuits such as heat and electromagnetic waves, to analyse information about the circuit and the devices.

Kazuo Sakiyama and his group at the University of Electro-Communications in Tokyo has uncovered a previously unknown target they refer to as 'fault sensitivity' that can be exploited in devices to retrieve sensitive data such as secret information (cryptographic key). The target lies on the threshold between a device's normal behaviour and any abnormal behaviour triggered when a device is attacked.

In certain attacks, a fault of some kind is deliberately introduced into the device environment – for example inducing strong magnetic field, or forcing the internal electronics to work faster than the device expects ('overclocking'). These cause the device processor to output incorrect results, potentially allowing attackers to decipher encrypted information.

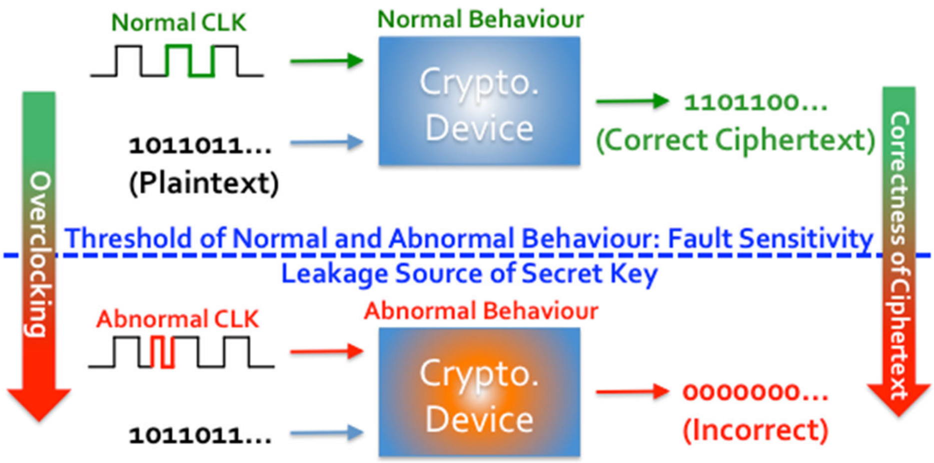
In a series of attacks on three different hardware implementations, Sakiyama and his team found that, during overclocking in one of the three implementations, the fault sensitivity threshold could be used to extract the secret key – the parameter that transforms ciphertext into plaintext. This was in spite of previous error safeguards in programs which stop working once the device is forced into abnormal behaviour.

The researchers believe that a specialized 'S-box', a component used to hide the relationship between the key and the ciphertext, incorporated into devices specifically to respond to timing abnormalities may lessen the chances of sensitive data leakage during the fault sensitivity attack.

Publication and Affiliation

Yang Li, Kazuo Ohta, & Kazuo Sakiyama. New fault-based side-channel attack using fault sensitivity. *IEEE* Transactions on Information Forensics and Security **7** (1) (2012).

All authors are affiliated with the Department of Informatics, The University of Electro-Communications, Chofu-shi, Tokyo, Japan
Authors e-mail addresses: liyang@uec.ac.jp; kazuo.ohta@uec.ac.jp; sakiyama@uec.ac.jp



Sakiyama Laboratory from the University of Electro-Communications discovered a weakness in the threshold of normal and abnormal behaviour during overclocking (CLK, above) in cryptographic device. This weakness could be used to reveal the secret key, the parameter used to change ciphertext to plaintext, allowing attackers to decipher a code.

UEC Aikido Club: Focus on flexible body and clear mind

"I decided to launch the UEC Aikido Club in 2007 when I joined the Department of Mechanical Engineering and Intelligent Systems at UEC," says Professor Kazutoshi Kikkawa. "At the time I did not have a lot of experience as an Aikido instructor. So I was pleased to meet Cheow-Keong Choo, an associate professor at the Center for International Programs and Exchange, who was more experienced than me and I asked him to take charge of the training sessions."

Training scene. Joint training with Seisen University Aikido members.

The UEC Aikido Club currently has about 20 members, who include domestic undergraduate and graduate students, international students from Senegal and Indonesia, UEC staff and faculty, and members of the public.

Members of the Club practice twice a week at the university dojo and once a month at the 'honbu-dojo' in Shinjuku with members of other clubs.

Training with Master Suzuki from Aikido World Headquarters (Honbu-

"Our training focusses on developing skills enabling flexible movements and a clear mind," explains Choo, who started to learn Aikido after graduating from UEC. "We do not train to destroy opponents. We follow the philosophy and spirit of Morihei Ueshiba, the founder of Aikido."

Importantly, the members of the Club do to not participate in competitions. "We only take part in demonstrations," says Kikkawa. "Also, I give a one semester course on Aikido as part of physical education at the university. It's rare for universities to offer courses in Aikido in Japan."

Kikkawa is also conducting research on Aikido, in particular biomechanical analysis of throwing techniques employed in the martial art. In a recent publication Kikkawa and colleagues analyzed the efficiency of the so-called 'Tenchi-nage' throw for experts and beginners. "We hope that our research will be a useful for both teaching and learning Aikido," says Kikkawa.

Reference

Kazutoshi Kikkawa, Hidetaka Okada, Takuya Yamabe, Three-dimensional motion analysis of Aikido Tenchi-nage, *Proceedings of the International Council for Health, Physical Education, Recreation, Sport, and Dance 2011* (ICHPER・SD ASIA, 2011).

Gigabit Research Consortium

Directors Yoshio Kami

The “Gigabit Era High Frequency Circuits and EMC Design Research Group” (known as Gigabit Research Consortium) was launched in October 2011 with goal of training engineers to design high frequency products and for technology transfer of research at the University of Electro-Communications, Tokyo.

Yoshio Kami giving a design guidelines seminar

“Our activities include consulting based projects with companies as well as sponsored and collaborative research, “says Kami “The Consortium has played an important role in the design of analog industrial products and advancement of research in this at universities. ”

In 2013 the consortium had a total of 101 members from industry and academia who attend out meetings, which include students of the members from academia.

Specific activities include:

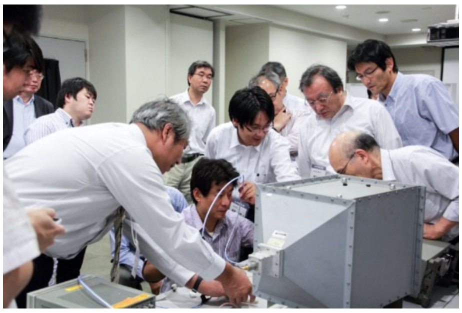
1. Symposia in the Spring and Fall with plenary talks and reviews of research by experts in analog design and technology.
2. 50 hour course of lectures and practical experiments on analog design and electromagnetic noise (Electromagnetic Compatibility: EMC; and EMI: Electro Magnetic Interference)
3. Industrial consultation

To-date, the Consortium has held 5 symposia, 9 lectures, 13 design guideline seminars, and 5 lectures courses. Also, the Consortium’s ‘myoelectric hand sub-committee’ is also active.

The Consortium has produced DVD media of the lectures on the 7 topics featured in the design guidelines seminars for e-learning.

The Consortium is conducting joint research with three companies this fiscal year.

The Consortium is also planning to launch a sub-committee group on 'power electronics' to discuss the technical aspects of EMC from large power devices such as motors in electric vehicles.



Participants at a meeting of the 'myoelectric hand sub-committee'

Letter from Alumni

Jie Chen, Director Professor, the Institute of Microelectronics, Chinese Academy of Sciences (IME,CAS), Beijing, China.

At Tiananmen Square, when I was invited by the Chinese government to attend the 60th founding anniversary

I received my master’s and doctorate degrees from the Department of Electronic Engineering, the University of Electro-Communications (UEC) in 1991 and 1994, respectively. My research theme was data compression based on information theory and wavelet theory. My supervisors were Professor Shin Hasegawa and Professor Shuichi Itoh.

I recall that when I first met Professor Itoh and discussed the research topics for my master ‘s degree in 1988, I actucally did not really understand why Professor Itoh advised me to do the research on data compression because at the time I could not imagine that data compression technologies would become so widely used in digital cameras, digital TVs and notebook computers ten years later.Now, when I look back twenty years later, I think that I was really lucky to choose data compression as my research theme at UEC under the guidance from Professor Itoh and Professor Hasegawa. Now, data compression technologies such as gzip for computer data lossless compression, and JPEG, MPEG, H.264 for image and video compression play an important role in the IT world. I really appreciate the foresight for reseach directions of my advisors at UEC. During my time at UEC, I learnt a lot from my superadvisors not only about academia but also issues related to independent thinking and research methdology.

In order commercilaize the findings of my research, I jointed the venture company YOZAN Inc., where I worked on mixed signal IC design for W-CDMA baseband processor for three years, and developed a series of mixed basedband chips with low power consumption feature for NTT DoCoMo.

Characteristic and evaluation of custom CMOS image sensors developed in-house by Superpix Micro Technology

Then In 1998, I returned to UEC to join the Itoh Lab. in the Graduate School of Information Systems as an associate professor, to work with my supervisor Professor Itoh to study data compression and mixed signal IC design. This was an enjoyable time for me to work in UEC from 1998 to 2001.

My studies in Japan were supported by a Japanese government schoolarship (Gokuhi Ryugakusei) but the opportnity to study in Japan was provided by Chinese government. So I had to return to China to serve my motherland where many people were poor and the economy and technology were waiting for developing. In 2001, I was selected by Chinese Academy of Sciences as one of the 100 Talented Scientists from overseas Chinese, and then returned to China to join the Institute of IME, CAS as a professor.

It is about 14 years since returning to China. During these 14 years, I have been involved in research and education on signal processing and mixed signal IC design for satellite navigator positioning baseband processors, multimedia processors and Network on a Chip (NOC) systems, and have advised more than 30 PhD students.

At the same time, I set up the two venture companies, LHWT Microelectronics and Superpix Micro Technology to develop wireless communications chips and CMOS Image Sensor (CIS) products. We have developed W-CDMA Airmonitor for NTT DoCoMo, WiFi baseband IPs for SONY, and also developed a series of CIS products.

I still have a good relationship with colleagues at UEC and support UEC activities in China by organizing the joint annual alumni meeting in Beijing and providing internship positions for UEC students. I am proud to be a UEC graduate and will love UEC forever.

The University of Electro-Communications (UEC) in Tokyo

is a small, luminous university at the forefront of applied sciences, engineering, and technology research. Its roots go back to the Technical Institute for Wireless Commutations, which was established in 1918 by the Wireless Association to train so-called wireless engineers in maritime communications in response to the Titanic disaster in 1912. In 1949, the UEC was established as a national university by the Japanese Ministry of Education, and moved in 1957 from Meguro to its current Chofu campus Tokyo.

With approximately 4,000 students and 350 faculty, UEC is regarded as a small university, but with particular expertise in wireless communications, laser science, robotics, informatics, and material science, to name just a few areas of research.

The UEC was selected for the Ministry of Education, Culture, Sports, Science and Technology (MEXT) Program for Promoting the Enhancement of Research Universities as a result of its strengths in three main areas: optics and photonics research, where we are number one for the number of joint publications with foreign researchers; wireless communications, which reflects our roots; and materials-based research, particularly on fuel cells.

International Public Relations
The University of Electro-Communications
1-5-1 Chofugaoka, Chofu, Tokyo 182-8585
E-mail : kokusai-k@office.uec.ac.jp
Website : http://www.uec.ac.jp/eng/