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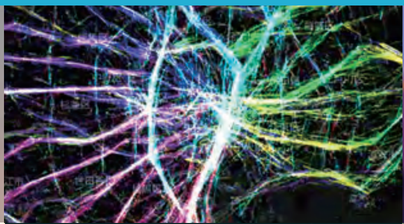
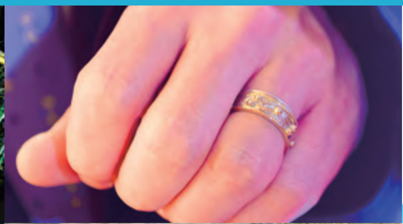
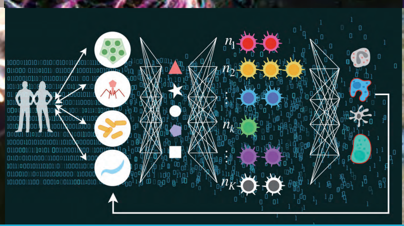
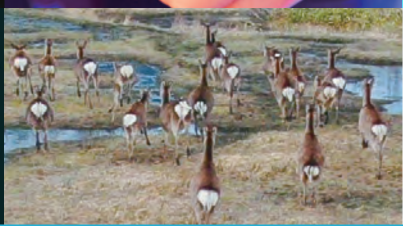
Institute of Industrial Science, The University of Tokyo


東京大学生産技術研究所
Institute of Industrial Science, The University of Tokyo

The "alchemy" of

Associate Professor Sakai turns vegetables and fruit waste into strong building materials that can be eaten in emergencies

As environmental concerns mount around the world, sustainable development has changed from just wishful thinking to an absolute necessity. Associate Professor Yuya Sakai of the Institute of Industrial Science, the University of Tokyo (UTokyo-IIS), is on a mission to develop technologies that make eco-friendly construction a practical and economically viable option. In particular, Sakai has been harnessing a modern-day "alchemy" that turns food waste and inedible food parts into construction materials that are stronger than concrete.


Associate Professor Yuya Sakai

In mid-2020, Associate Professor Yuya Sakai, a specialist in sustainable construction materials at UTokyo-IIS's Department of Human and Social Systems, heard some jaw-dropping research results: A new material made of Chinese cabbage had a bending strength four times greater than that of concrete.

The unexpected – but welcome and groundbreaking – findings were reported to Sakai by one of his undergraduate students, Kota Machida, who was doing experiments that involved making construction materials from various edible and inedible food items. Machida also was thrilled that the experiments conducted under Sakai's guidance had produced such stunning results.

"Initially, I thought we could make lumps from these materials, but I never imagined they would be so strong," Sakai said. "That was the moment when I became confident that we can make value-added, strong construction materials out of food waste."

This new technology could help reduce Japan's food waste, which has become a growing social problem in recent years. According to the Environment Ministry, Japan produced about 6 million tons of food waste – edible but discarded for one reason or another – in 2018. The nation also threw away about 19 million tons of "inedible" food items such as skins, outer leaves, damaged crops or "non-standard" farm products that are too big, too small or are not of the desired appearance. Most end up being used for fertilizer and animal feed, or get incinerated or buried as rubbish.

Another huge advantage of these raw materials is that acquiring them will not break the bank. They often can be procured at no cost, and, in some cases, a small fee is paid to anyone who takes them away, Sakai said.

Temperature key to making strong materials

Under the method Sakai's team developed, which is patent pending, vegetables and fruits are dried, turned into powder and then subject to thermal compression. The materials retain some of the food's aroma and taste.

Pinpointing the right temperature was the first major hurdle. "We first heated powdered foods, such as tea leaves, to 200℃, but they ended up burning or going mushy," Sakai said. "After realizing that we must apply the optimal temperature to each specific food item, the research went smoothly."

The temperatures applied vary, but average around 100℃. This process does not emit a lot of carbon dioxide (CO_2). Pressure applied to the mix is about 20 MPa, equivalent to the pressure 2,000 meters under the sea.

The acquired bending strength also depends on the ingredients. Material made of Chinese cabbage yielded the greatest strength, while one made of pumpkin was weak. Adding Chinese cabbage to pumpkin increased the strength, Sakai added.

Just why this process creates such strong materials remains under study, but Sakai hypothesizes that sugar in the food is softened by the heat, flows into gaps among the fine powder particles during compression and then serves as an adhesive when cooled. A material made of Chinese cabbage could withstand 18 MPa, far more than concrete's about 5 MPa.

The research results raised hope that such materials could replace some, if not all, concrete used for construction at a time when its ingredients such as sand, gravel or crushed stones are in short supply. Cement, an adhesive for concrete's ingredients, is made from, among others, limestone that must be heated to as high as 1,500℃ to burn. This process requires CO_2-emitting energy and also releases this gas from the limestone. In fact, CO_2 emissions from cement manufacturing account for a staggering 8 percent of global emissions.

Further information

Sakai Laboratory
https://r.goope.jp/ysakai
https://www.iis.u-tokyo.ac.jp/en/news/3567/

sustainability

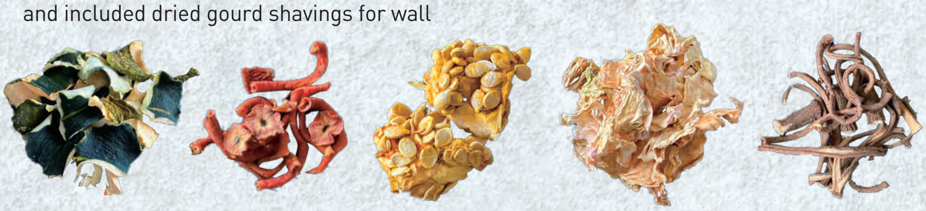
Making construction materials edible

Another astonishing aspect of these materials is that they are edible. According to Sakai, however, eating building materials is nothing new in Japan. "For example, Kumamoto Castle is known for using some edible construction materials," Sakai said. This castle built centuries ago in the southern prefecture of Kumamoto reportedly used taro stalks for tatami mats and included dried gourd shavings for wall materials to provide food when it was under siege.

The team has verified that seasonings such as sugar, salt and powdered broth boost the overall strength. The materials can also be used to make accessories, tableware and furniture, to name but a few. "They can be used to make plates," Sakai said. "You could eat a meal and the plate, too."

Enhancing the materials' durability is the next task. Sakai's team is conducting experiments with edible waterproofing agents after confirming conventional agents used for wood work well but are not edible.

Since the new materials were unveiled in May 2021, Sakai's team has received suggestions to try various food items, including seaweed, crab shells and mushroom. "People send us all kinds of food waste to include in our experiments," Sakai said. "We are hoping to make good materials that combine various kinds of food waste."



Drying : Dried vegetable and fruit waste

Making powder:
Pulverized vegetable and fruit waste

Molding : Heat-pressing machine

Addressing concrete problems

Sakai is involved in several concrete-related research projects. One project focuses on recycling concrete in a sustainable manner. Crushing old concrete structures and compressing the powder can produce new, robust concrete, he said.

Sakai's research could even have implications that go beyond our planet. Sakai is conducting research to determine whether sand particles, for example those on the moon, could be bonded without using conventional adhesives, such as cement or resins. "If that sand could be held together with alcohol and a catalyst to make construction materials, structures could be built on the moon," Sakai said.

An avid reader of any genre, Sakai often gets research inspiration from reading books. Sakai also is a father of three small children, and he gets up at 5 a.m. so he has time in the evenings after work to play with and care for them.

A Model of

Project Professor Sekimoto develops first nationwide pseudodata

The COVID-19 pandemic has demonstrated how crucial it is to control people's movement if we want to contain the virus's spread. Project Professor Yoshihide Sekimoto of the UTokyo-IIS, the University of Tokyo (UTokyo-IIS), is pursuing an ambitious project using samples of recorded data to create pseudodata on how people move around the whole of Japan. The use of the data will circumvent lengthy, cumbersome processes to clear privacy issues related to sharing data, including those from the global positioning system (GPS) collected by mobile carriers.

In the latter half of the 2010s while conducting his research, Project Professor Yoshihide Sekimoto, a specialist in human-centered urban informatics, repeatedly hit privacy-related stumbling blocks while exploring ways to share GPS data for tracking the movement of people.

"GPS data from cellphones are extremely useful in discovering various phenomena," said Sekimoto who tracked the flow of people in the Tokyo metropolitan area right before and after the 2011 Great East Japan Earthquake for the first time using GPS data. "But such data (even after being processed) cannot be shared with other researchers due to stringent regulations over personal data, meaning there is no data widely available on the movement of people as a common asset."

The restrictions prompted Sekimoto to seek an alternative way to assess the movement of people without using GPS data – albeit one that would be less accurate. But the emergence of COVID-19 was the driver behind Sekimoto's push to generate pseudodata – data which simulates real-life behavior – for research.

Flow of people when the Great East Japan Earthquake occurred

Project Professor Yoshihide Sekimoto

Pseudodata proves its worth

A team led by Sekimoto, who also serves as professor at UTokyo's Center for Spatial Information Science, has so far generated pseudodata on the movement of people in Shizuoka and Toyama prefectures, the former of which faces the Pacific, and the latter, the Sea of Japan.

Shizuoka Prefecture is the 10th most populous of Japan's 47 prefectures with a population of 3.6 million as of 2019, while Toyama Prefecture ranks 37th with a population slightly over 1 million.

But how did the Sekimoto manage to model how people move around without using GPS data?

His team used national census data to gain knowledge about the ages and genders of people living in communities and combined them with available open or low-cost data, including those extracted from buildings and means of transportation. Sekimoto then defined three agent-based models for the data: commuters who leave their house in the morning and return in the evening; housewives or househusbands who occasionally visit grocery stores and other destinations nearby; and students who commute to their primary, middle or high schools.

"The pseudodata based on this method so far had a correlation coefficient (a statistic used to show how the scores from one measure relate to scores on a second measure for the same group of individuals) score of 0.75 compared with the actual GPS data," Sekimoto said, explaining that a coefficient score of 1.0 is a perfect match between the two sets of data. "In certain areas, we succeeded in recreating traffic volumes by time slot with a high accuracy."

The team plans to complete pseudodata covering all of Japan by the end of this year as it aims to hone to attain a correlation coefficient score of 0.9. To improve the data's accuracy, the team will identify destinations of each of the distinct models, such as commuters' workplaces, with more accuracy, and then add more models for other demographics including senior citizens.

"We are preparing to allow researchers to share our urban digital twin (a virtual representation of an urban area) made based on people-flow pseudodata during the pandemic and beyond," Sekimoto said.

Ingenuity of how people move around in Japan for the post-COVID-19 world

Wide range of applications possible

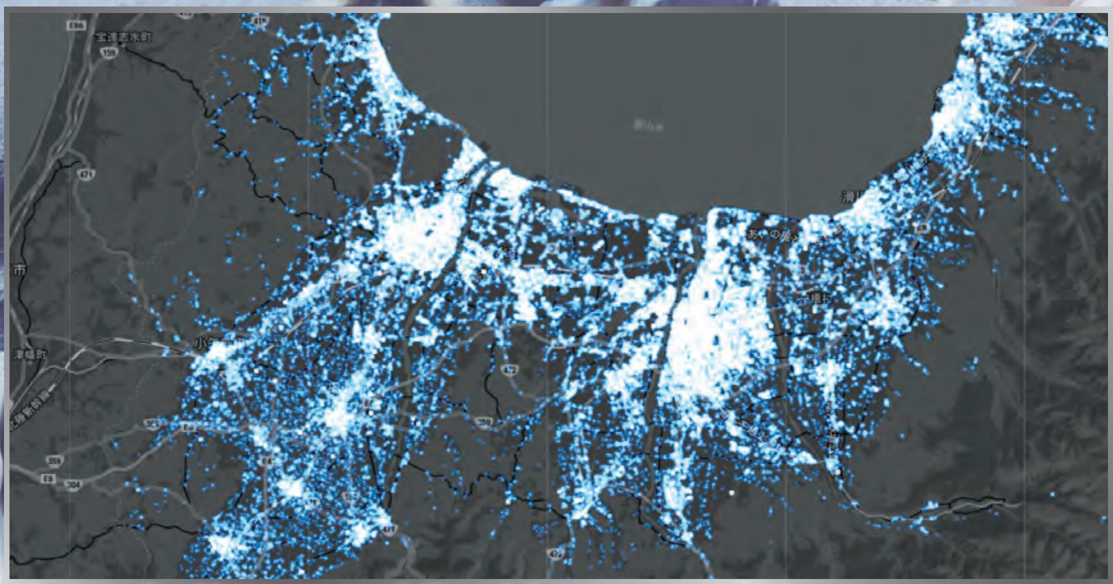
Sekimoto first got involved in the study of the movement of people when the People Flow Project was launched at the Center for Spatial Information Science in 2008 when no GPS data was available.

"I wanted to roughly track the movements of millions of people," he said. He initially used the results of surveys questioning how people moved around before GPS data became available in the 2010s.

One of his research topics using GPS data was to analyze how people evacuated in the wake of major earthquakes such as those in East Japan in 2011 and Kumamoto in 2016. He also analyzed how people's contacts affected the spread of COVID-19 – only to find once again that this research data could not be shared with other researchers.

Pseudodata, on the other hand, will facilitate data sharing among researchers, a step that can make significant contribution to scientific advancements – be it infection control or disaster management. The data is expected to be available for researchers free of charge by the end of the academic year in March 2022.

Its development also has implications overseas. Previously Sekimoto had to sign a memorandum of understanding with each Asian cellphone carrier to conduct research, which limited the setting for research to the country where it was located. "If we use pseudodata, we can share them among researchers across the world," he said.



Visualization of people's movements across all of Toyama Prefecture (at noon, on a weekday)

3-D digital twin to transform urban informatics

Sekimoto, in his work as a researcher, is also focusing on the high-speed generation of a three-dimensional, hot-standby digital twin that allows users to look at a digital map while also obtaining detailed, relevant data with a click, through the use of software Sekimoto is developing.

Sekimoto wears many hats in addition to his academic positions. He is the head of the Association for Promotion of Infrastructure Geospatial Information Distribution, a nonprofit organization dedicated to collecting and distributing data related to social infrastructure. One of the latest pieces of information the association unveiled was related to a massive mud slide that struck the Atami hot spring resort in Shizuoka Prefecture – within 24 hours of when disaster struck on July 3, 2021.

He also serves as a director of UrbanX Technologies, Inc., a start-up launched in 2020 by one of his former graduate students, Hiroya Maeda. The company provides data collected by mobile phones and dashcams and analyzed with artificial intelligence (AI) for road maintenance. Its technologies are based on research Maeda conducted under the guidance of Sekimoto.

Maeda has described Sekimoto as a down-to-earth teacher who can steer his students toward interesting research topics like his.

"Maybe my demeanor lacks a kind of gravitas usually associated with a university professor," Sekimoto laughed. "But I try not to put up unnecessary barriers between me and my students so that they can engage in their work in a free atmosphere."

Further information

Sekimoto Laboratory
http://sekilab.iis.u-tokyo.ac.jp
https://www.iis.u-tokyo.ac.jp/en/news/3393/

The ring presented along with the honorary degree

Norwegian ambassador Inga M. W. Nyhamar presenting the honorary degree to Prof. Okabe

Honorary doctorate bestowed upon Prof. Toru H. Okabe by the Norwegian University of Science and Technology (NTNU)

On Friday, March 26, 2021, Professor Toru H. Okabe was awarded an honorary doctorate, *i.e.*, Doctor Honoris Causa at the Norwegian University of Science and Technology (NTNU), for his contribution to "URBAN MINING" for developing new and more sustainable methods for the production and resource recovery of metals used in modern electronic devices.

This award symbolizes the world leadership of Japan in this research field.

The conferral of honorary degrees at NTNU has a long history dating back to 1935, with 97 recipients to date. Professor Okabe is the third Japanese recipient of this honorary degree, which was also given to Professor Hiroyuki Yoshikawa, a former president of the University of Tokyo, in 2001.

The honorary doctoral award ceremony, which had been postponed because of the COVID-19 pandemic, was held online by the NTNU in Trondheim, Norway, and the Norwegian Embassy in Japan. In this first of its kind online ceremony, Anne Borg, Rector of NTNU, conferred an honorary doctorate via Inga M. W. Nyhamar, the Norwegian Ambassador, to Professor Okabe in Japan. The ceremony was well organized by the university and embassy officials.

Prof. Okabe receiving an honorary degree from the ambassador at the Norwegian embassy in Japan

Prof. Geir Martin Haarberg, NTNU, Norway, introducing Prof. Okabe's research contributions with a global impact

Rector Anne Borg of NTNU, Norway conducting the honorary doctoral award ceremony

Further information

The video of the award ceremony can be seen on YouTube:
https://www.youtube.com/watch?v=k5lg9nDX-W0

The list of achievements of the recipient can be found on the following link:
https://no.wikipedia.org/wiki/Toru_H._Okabe

Wish upon a Star

On July 21, 2021, IIS International Mixer #3 was held with the theme of *Tanabata*, or Star Festival, and some 50 students and researchers from various countries enjoyed an evening of Japanese cultural experience.

According to tradition, the participants wrote their wishes on colorful strips of paper called *tanzaku* and hung them on bamboo branches. They also enjoyed playing with hand-held fireworks which are commonly used for summer evening entertainment in Japan.

Asmaa from Morocco said, "I have been feeling isolated due to COVID-19 since I came to Japan last November. This event is the first time that I could meet other colleagues. It is great." Sakil from Turkey also said, "This is very interesting. It's the first time for me to try fireworks. It's very nice to meet people from different labs."

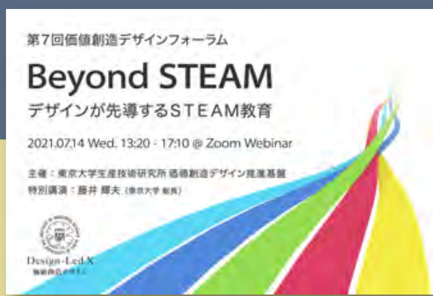
Here are some of the wishes by the participants:

- Health, prosperity, happiness
- Pizza
- I wish for a happy year in the lab
- No more corona
- I wish we may travel freely very soon
- Smooth employment

Let's hope that their wishes will come true!

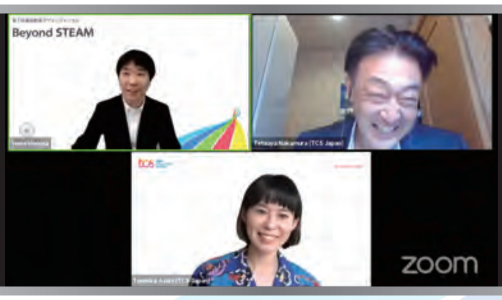
The 7th DLX Forum "Beyond STEAM: Design-Led STEAM Education"

On the 14th July 2021, the IIS platform, Design-Led X (DLX) held The 7th DLX Forum "Beyond STEAM: Design-Led STEAM Education". This online event was held as part of Design Symposium 2021.



The theme of the forum was "Beyond STEAM" and how design could take a leading role in STEAM education was discussed. In the first section of the forum, President of UTokyo Prof. Fujii, gave a special lecture. Then, Mr. Nakamura and Ms. Asahi from Tata Consultancy Services Japan (TCSJ) gave talks representing corporate members of DLX. In the second part, Prof. Pennington and members of the DLX Design Lab presented their recent projects. Finally, Prof. Murakami from the UTokyo School of Engineering gave a presentation, and he then joined a panel discussion led by Prof. Yamanaka with Prof. Toya from DLX, and Ms. Asahi from TCSJ.

The forum was a success and attracted about 300 attendees.



Learning to Help the Adaptive Immune System

Researchers at The University of Tokyo use the mathematics of adaptive learning and artificial intelligence to describe how T helper cells adjust the response of the vertebrate immune system, which may lead to new vaccines and treatments for infections.

UTokyo-IIS demonstrated how the adaptive immune system uses a method similar to reinforcement learning to control the immune reaction to repeat infections. This work may lead to significant improvements in vaccine development and interventions to boost the immune system.

In the human body, the adaptive immune system fights germs by remembering previous infections so it can respond quickly if the same pathogens return. This complex process depends on the cooperation of many cell types. Among these are T helpers, which assist by coordinating the response of other parts of the immune system—called effector cells—such as T killer and B cells. When an invading pathogen is detected, antigen presenting cells bring an identifying piece of the germ to a T cell. Certain T cells become activated and multiply many times in a process known as clonal selection. These clones then marshal a particular set of effector cells to battle the germs. Although the immune system has been extensively studied for decades, the "algorithm" used by T cells to optimize the response to threats is largely unknown.

Now, scientists at The University of Tokyo have used an artificial intelligence framework to show that the number of T helpers act like the "hidden layer" between inputs and outputs in an artificial neural network commonly used in adaptive learning. In this case, the antigens presented are the inputs, and the responding effector immune cells are the output.

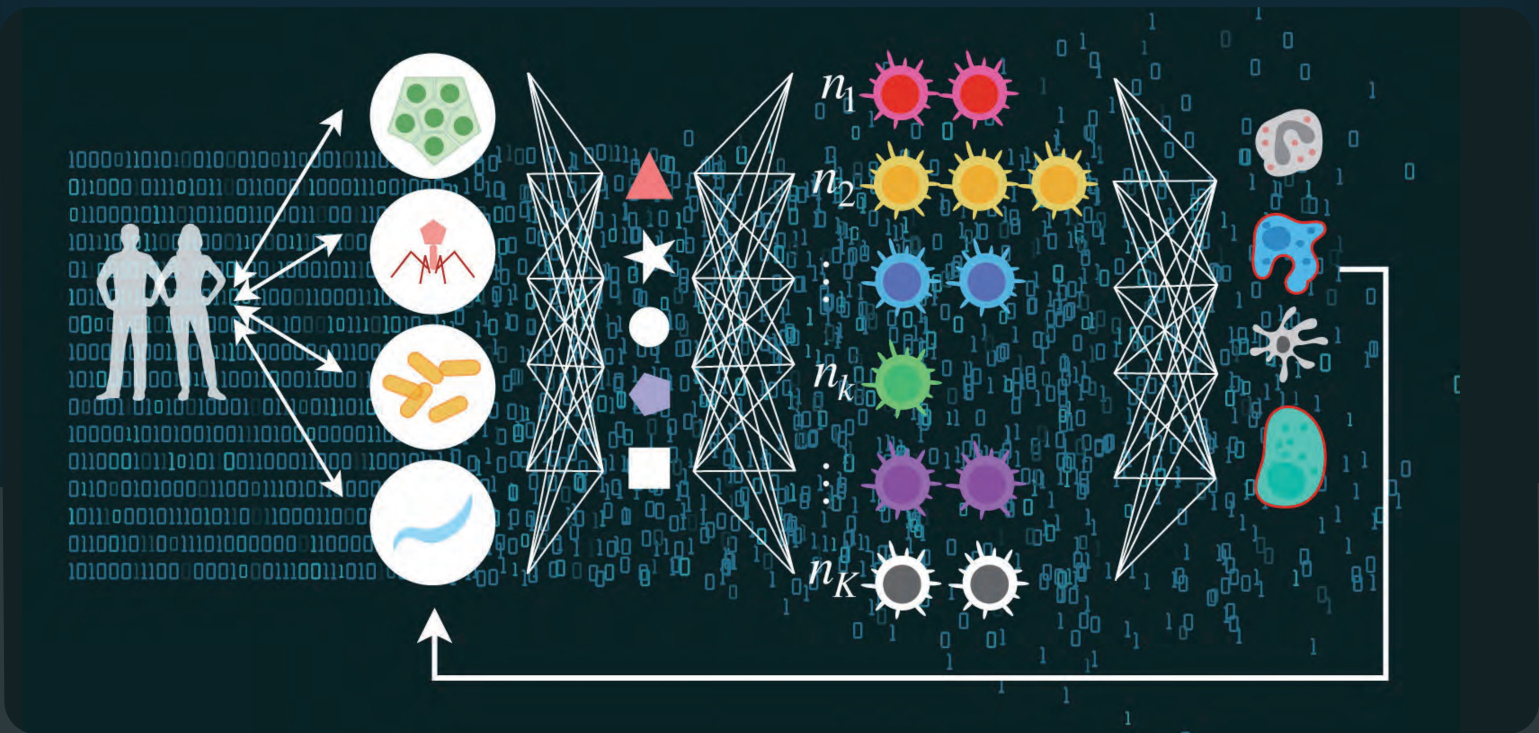
"Just as a neural network can be trained in machine learning, we believe the immune network can reflect associations between antigen patterns and the effective responses to pathogens," first author Takuya Kato says.

The main difference between the adaptive immune system compared with computer machine learning is that only the number of T helper cells of each type can be varied, as opposed to the connection weights between nodes in each layer. The team used computer simulations to predict the distribution of T cell abundances after undergoing adaptive learning. These values were found to agree with experimental data based on the genetic sequencing of actual T helper cells.

"Our theoretical framework may completely change our understanding of adaptive immunity as a real learning system," says co-author Tetsuya Kobayashi. "This research can shed light on other complex adaptive systems, as well as ways to optimize vaccines to evoke a stronger immune response."

Associate Professor
Tetsuya J. Kobayashi

Reference
Takuya Kato, Tetsuya J. Kobayashi
Understanding Adaptive Immune System as Reinforcement Learning
***Physical Review Research*(2021), DOI: 10.1103/PhysRevResearch.3.013222**



Project Professor
Oki Kazuo

Listening to the Call of the Wild: Tracking Deer Movements Using Sound

Researchers from UTokyo-IIS have designed a new type of system using listening devices to detect and track deer positions in the wild.

In the marshland of Japan's Oze National Park, keeping track of the deer population has been a difficult and time-consuming task for the park rangers. Now their lives could get much easier, thanks to a novel technique for tracking deer movements using unmanned listening devices developed by researchers at the UTokyo-IIS, a part of The University of Tokyo.

Monitoring deer numbers is important in Oze and other national parks in Japan because deer are not native to the ecosystem and can have damaging effects on it. Current methods of monitoring deer populations range from traditional techniques such as counting droppings to photographing deer at night using automated cameras or from above during the day using unmanned aerial vehicles (UAVs). Each of these methods has its drawbacks and limitations—for example, the thick forest cover in some parts of the national park makes it difficult to see the deer from above using UAVs.

"The problem with using recording devices to estimate the size of deer populations in the past was that it was difficult to avoid counting the same deer multiple times—by setting up a grid of listening stations, we are able to triangulate the position of each deer with precision and track its movements," says Tadanobu Okumura, one of the researchers who developed the technology.

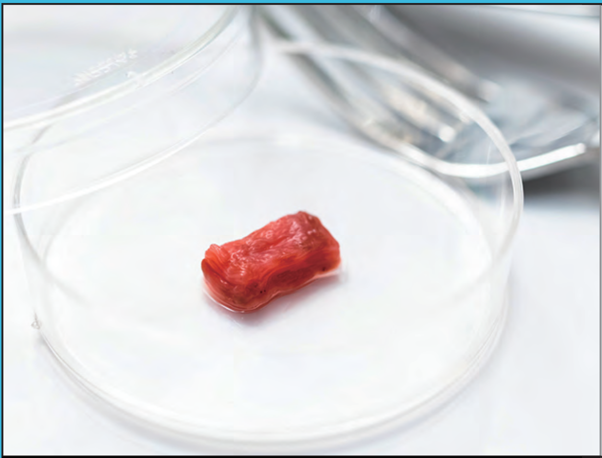
The researchers built a prototype listening station which is powered by solar panels and automatically synchronizes its internal clock with a GPS satellite. As the recordings from each of the stations are synchronized, the lag in the time it takes the sound of a deer to reach the recording station can be used to determine its location with precision using a triangulation technique.

"When we tested our prototype in an experimental setting in the playground of The University of Tokyo, we were able to pinpoint the location of a sound within five meters. In a second trial under more realistic conditions in the marshland at Oze National Park, it was possible to locate a sound to within about fifteen meters," explains Kazuo Oki, who also worked on the project. During a two-hour trial in Oze, the system picked up 72 distinct deer calls.

This prototype is a first step toward building a system that can be installed in the wild and monitored remotely. In the muddy wetlands of Oze, this could make the task of counting deer a lot easier.

Reference

Salem Ibrahim Salem, Kazuhiko Fujisao, Masayasu Maki, Tadanobu Okumura and Kazuo Oki
Detecting and tracking the positions of wild ungulates using sound recordings
Sensors (2021), DOI: 10.3390/s21030866

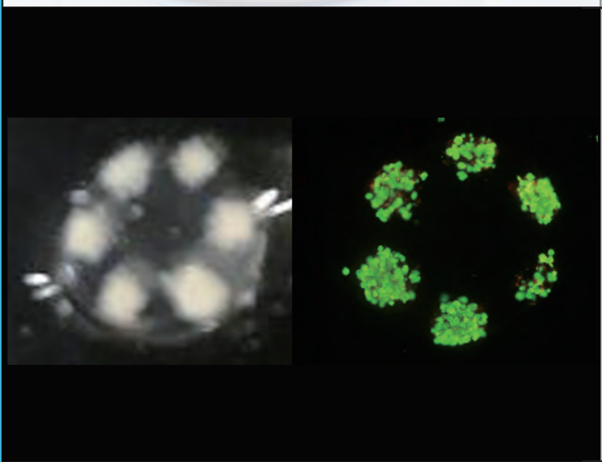


Meeting the meat needs of the future

A research team led by Shoji Takeuchi have succeeded in culturing meat in the laboratory in the form of millimeter-scale slabs of contractile bovine muscle. This innovative tissue culture process, arrayed in stackable hydrogel modules, uses electrical pulses to align myotubules thus mimicking the texture, grain and bulk of real steak meat. Further advances may help meet the increasing worldwide demand for dietary meat while addressing economic, environmental and ethical concerns that beset animal slaughter today.

Science of Food (2020), DOI: 10.1038/s41538-021-00090-7

Further information https://www.iis.u-tokyo.ac.jp/en/news/3495/

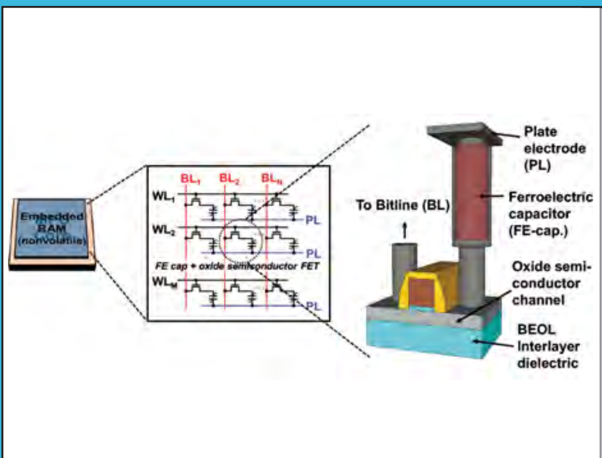


Replacing what was lost: A novel cell therapy for type I diabetes mellitus

A research team led by Shoji Takeuchi developed a novel device for the safe and effective transplantation of human pancreatic beta-cells in type I diabetes mellitus (T1D). By constructing a millimeter-thick graft encapsulating beta-cells and transplanting it in diabetic mice, they were able to show that the device was removable for up to 1 year and without a significant foreign body response. This study demonstrates a novel option for cell therapy for T1D.

iScience (2021), DOI: 10.1016/j.isci.2021.102309

Further information https://www.iis.u-tokyo.ac.jp/en/news/3520/

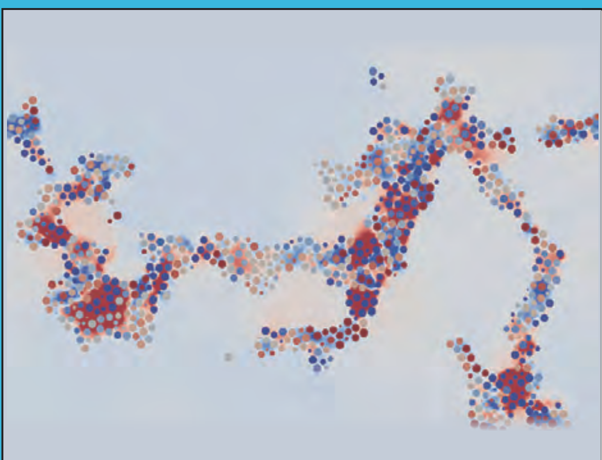


Closer hardware systems bring the future of artificial intelligence into view

A research team led by Masaharu Kobayashi integrated a mobility-enhanced field-effect transistor and ferroelectric capacitor to reduce the energy required by machine learning computation. Both elements contained tin-doped indium gallium zinc oxide, which can be included in the ‘back end of line’ layers of integrated circuits. The proximity that this made possible is expected to contribute to high-density, energy-efficient computing for future AI applications.

presented at VLSI Technology Symposium (2021)

Further information https://www.iis.u-tokyo.ac.jp/en/news/3569/



Discovery of a new law of phase separation

A research team led by Hajime Tanaka show that the dynamics of spontaneous phase separations forming network structures can be controlled by the slow dynamics in the networks formed. This work may lead to cheaper and more powerful rechargeable batteries.

Nature Communications (2021)
DOI : 10.1038/s41467-020-20734-8

Further information https://www.iis.u-tokyo.ac.jp/en/news/3484/

UTokyo-IIS

Professor Toru H. Okabe, Director General

Message from the Director General / Scope

The Covid-19 pandemic has transformed our lives, making us realize the limits of science and technology against formidable viruses. At the same time, through remote work and online lectures, we have become more aware of the importance and the future potential of digital transformation (DX). Many issues cannot be solved by technology alone. However, engineering is expected to play an increasingly important role in meeting the challenges of modern society, which has become ever more complicated and diversified.

The Institute of Industrial Science (IIS) at the University of Tokyo is the largest university-affiliated research institute in Japan. With a commitment to pursuing academic truth, the UTokyo-IIS carries out a wide range of educational and research activities, such as cross-disciplinary research that transcends academic boundaries — which is a traditional feature of the UTokyo-IIS — as well as practical industry–academic collaboration, international collaboration, and hands-on research aimed at social implementation.
In 2019, we celebrated our 70th anniversary. During the past 70 years, there have been significant research accomplishments and we have succeeded in producing many outstanding members of society.

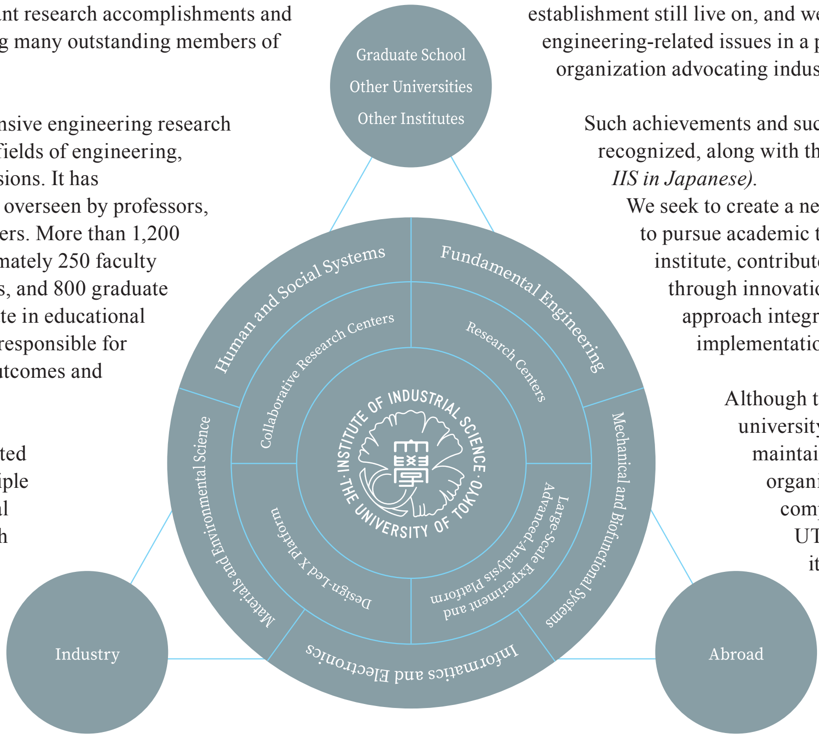
The UTokyo-IIS is a comprehensive engineering research institute that covers almost all fields of engineering, consisting of five research divisions. It has approximately 120 laboratories overseen by professors, associate professors, and lecturers. More than 1,200 personnel, comprising approximately 250 faculty members, 150 support members, and 800 graduate students and postdocs participate in educational and research activities that are responsible for producing excellent research outcomes and fostering outstanding talent.

Furthermore, there are 3 affiliated research centers that span multiple research departments, 7 internal centers, 2 collaborative research centers, and an international collaborative research center that pursues international joint research. In addition to promoting original research in specialized fields, each laboratory systematically engages in interdisciplinary or international activities by using organizations such as the cross-disciplinary research centers.
In 2017, the Chiba Experiment Station was relocated from its original site in Nishi-Chiba to the Kashiwa Campus, and since 2020, the facility is operating as a Large-scale Experiment and Advanced-analysis Platform (LEAP). In addition, a completely new facility called the "Design-Led X Platform," the first of its kind, has also begun operations in 2017.

Since the foundation of the UTokyo-IIS, we have been acutely aware that the significance of academic research in engineering lies in its real-world implementation. Not only have we created new academic fields through enhanced specialization and collaboration across disciplines, but we have also developed and deployed technologies that can contribute to solving problems in the real world. In addition, we have made it our mission to develop individuals who will shoulder the responsibility of developing and disseminating technology in the industrial world.
The spirit and the sense of mission of the UTokyo-IIS since its establishment still live on, and we tackle various engineering-related issues in a practical manner as a pioneering organization advocating industry–academic collaboration.

Such achievements and such a proactive stance are widely recognized, along with the name *SEIKEN (short name for IIS in Japanese)*.
We seek to create a new "*SEIKEN* style" as we continue to pursue academic truth as a university research institute, contribute to the creation of new value through innovation, and aim for a multidisciplinary approach integrating humanities and sciences for implementation in the real world.

Although the UTokyo-IIS is the largest university research institute in Japan, it maintains a strong sense of unity as an organization. Using its agility and comprehensive capabilities, the UTokyo-IIS will continue to fulfill its role as one of the world's top research institutes in the field of engineering. We believe that we will continue to make great contributions to society through research and education.



Five Research Departments and Research Centers

Institute of Industrial Science, The University of Tokyo (UTokyo-IIS)
https://www.iis.u-tokyo.ac.jp/

Komaba Research Campus (Komaba II Campus)
4-6-1 Komaba Meguro-ku, TOKYO 153-8505, JAPAN
E-mail: koho.iis@gs.mail.u-tokyo.ac.jp

Kashiwa Campus
5-1-5 KASHIWANOHA KASHIWA-SHI, CHIBA 277-8574, JAPAN (Kashiwa Campus)
6-2-3 KASHIWANOHA KASHIWA-SHI, CHIBA 277-0882, JAPAN (Kashiwa II Campus)
E-mail : kashiwa.iis@gs.mail.u-tokyo.ac.jp

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