

# The Collection of Research Abstracts of Project Studies II

- as part of the class of English Communication II -

March 2026

Ochanomizu University Senior High School

## Editor's Note

Dear Readers,

I am delighted to share this collection of Project Studies II research abstracts, which were written in the class of English Communication II. Before writing their abstracts, the students learned about “Putting iPS cells into Practice” in the textbook, and then read the abstract of Dr. Yamanaka and his team’s paper which first introduced their method of creating human iPS cells. This aims at a kind of collaboration of Project Studies II and English Communication II, and through the activity of writing their own research abstracts, the students (as potential researchers in the future) understand how research scientists around the globe construct and write their papers and abstracts in English.

I hope you all enjoy reading these research abstracts and feel the students’ enthusiasm.

Warm regards,

T.H.

## Research Titles

To Improve the Tool That Optimizes and Evaluates Renewable Energy Mix : RE ミックスの地域別最適化及び評価ツールの改良

How to Tie Shoelaces -Find a Knot that Stays Tied Longer- : ほどけにくい靴ひもの結び方

Enhancing Fans’ Satisfaction via Concrete Refereeing Explanation in Football : サッカーにおけるファンの納得感を高める判定説明の提案

The Way to Widen our Horizons Which is Affected by Filter Bubble : フィルターバブルで狭まる視野を広げる手法

Improvement of Obstructed View Seats in Kabuki Theatre : 歌舞伎劇場における見切れ席の改善

Creating Characters Which Gain Popularity : 人気が出るキャラクターを創ろう！

Development of an Evacuation Route Suggestion System for Ochanomizu Senior High School : 災害時の避難経路提案システム at お茶高

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The Concave Polyhedron like Regular Hexahedron : 正凹六面体

Reducing Egg White Allergenicity by Combining with Other Foods : 食品の組み合わせによる卵白アレルギー性の低下

Development of an Immobilized Yeast Gel for Efficient Bioethanol Production : バイオエタノール生産の効率化を目的とした酵母固定化ゲルの開発

How to Increase the Foaming Properties of Soybean Extract in Muffins : 焼き菓子における大豆の煮汁の起泡性を高める方法

Exploration of Salt-Elimination Methods Using Kombu Dashi : 出汁を用いた排塩方法を探る

Creating Conductive Fabric Using Polyaniline : ポリアニリンを用いて導電性のある布を作りたい

Making Washable Calligraphy Ink : 洗濯で落ちる墨汁を作る

Increasing the Transparency of Biodegradable Plastics : 生分解性プラスチックの透明度を上げる

Extending the Shelf Life of Meat through Aging : 肉の熟成による保存期間の延長

Investigation of Hair Care Effects Using Mandarin Orange Peel and Yusuru (Rice Water) : ミカン果皮と泔(ゆする)の髪への効果の検証

Why Alternanthera Philoxeroides Has the Strong Reproductive Ability : ナガエツルノゲイトウはなぜ繁殖力が強いのか

Composting at Home to Reduce Food Waste : 家庭から始めるコンポスト利用による生ごみ削減

Long-term Preservation of Water Using Lactic Acid Bacteria : 乳酸菌を用いた水の長期保存

How Environmental Conditions Affect Pill Bugs’ Rolling up : ダンゴムシにおける環境条件と丸くなる行動の関係性について

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What Are the Features of Appealing Science Fiction Novels?—Through an Analysis of the Hoshi Shinichi Award-Winning Novels—

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A Comparative Study of Distribution Control Regimes for Managing Militarily Convertible Drones -Focusing on Export Controls in Japan, the United States, and Europe-：軍事転用可能なドローンの管理に向けた流通管理制度の比較研究—日・米・欧の輸出管理に着目して—

Ways to improve animal exhibits to reduce repetitive behaviors -Interviews with staff at Tama Zoological Park

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## **To Improve the Tool That Optimizes and Evaluates Renewable Energy Mix**

Ayane Okuno and Miyu Kaida

### **Abstract**

We tried to add “hydrogen power generation” in the tool that optimizes and evaluates renewable energy (RE) mix created by Keiko Hori in Nara University. Recently, there has been a problem of high CO<sub>2</sub> emissions, and many researchers are working on this problem. In the previous study, Hori created the tool including renewable energy sources such as solar power, wind power, hydropower, geothermal energy, and biomass energy. However, hydrogen power generation was not included in the tool. So, in this paper, we propose to add a new power generation to improve the tool. There are two ways to conduct this study. At first, we collected intensity data by calculation. Then, the data was added into the original tool made by Hori. The result shows that there is a big loss about economic benefits, and that more CO<sub>2</sub> emissions can be reduced than other power generation systems. Through this study, we found that the study of hydrogen power is still scarce. Moreover, we need to think about how the data would change if we changed the conditions as this time we limited the situation.

## **How to Tie Shoelaces -Find a Knot that Stays Tied Longer-**

Nene Imao, Fumika Kawase, and Yuika Nishitani

### **Abstract**

This study is an investigation to find the most secure shoelace knot. Although there are many knots that are difficult to untie, there has been no mathematical research on why the knot is difficult to do so. Then, this paper aims to compare three existing knot-tying methods, determine which is the most difficult to untie, and mathematically elucidate why it is difficult to do so. We evaluated each knot from the perspectives of Structure, Area, and Semi-three-dimensional figure by drawing diagrams and constructing models. It was found that Ian's Secure Shoelace Knot had the most regions among the three knots by considering semi-solid models. The result mathematically suggests that Ian's Secure Shoelace Knot is the most difficult knot to untie. We also succeeded in creating a mathematical model that quantifies security. These findings are indeed useful for researchers to do relevant studies not only in shoelaces but also in various fields such as ropes.

## **Enhancing Fans' Satisfaction via Concrete Refereeing Explanations in Football**

Hijiri Kawanami and Rio Kobashi

### **Abstract**

This study proposes effective methods for explaining refereeing decisions in soccer to increase fans' satisfaction. While the English Premier League uses a dedicated social media account to explain VAR decisions, many fans still express dissatisfaction. The goal of this research is to identify the causes of these complaints and apply findings to the J-League. We analyzed fans' reactions on the “Premier League Match Centre” X account, categorizing complaints and evaluating how four levels of explanation -from “Result Only” to “Visual Information”- affect fan's perception. The results revealed that they often express frustration toward referees and organizations, particularly when descriptions are abstract. However, providing concrete

details and visual evidence significantly reduces emotional criticism and improves understanding. In conclusion, to enhance fans' satisfaction, organizations should provide specific information, such as the rules applied and player details. Implementing a similar account in the J-League with concrete descriptions will improve transparency and foster a better relationship between fans and officials.

### **The Way to Widen our Horizons Which is Affected by Filter Bubble**

Shiori Hosoe and Haruka Miyoshi

#### **Abstract**

This study investigates what we can do to prevent from narrowing our horizons when using the social media. Recommender systems in social media is a leading cause of getting into filter bubble, a situation which a person only get similar thoughts. Because of this, many people have a biased view. Therefore, in this paper, we propose a system in which users can see others' opinions that are different from their ways of thinking. First, using mechanical learning was carried out to estimate one's sense of value from the opinion automatically. Then, we did programming to show others' thoughts depending on the estimation. As a result, we could make a system we mentioned before, but we couldn't examine whether it really widen our horizons. Also, the accuracy of estimation might have been low. Though verification have not carried out yet, this system will open up new opportunities to help decrease the number of biased views. Still, there is a need to improve accuracy and investigate the effect of this system.

### **Improvement of Obstructed View Seats in Kabuki Theatre**

Imako Ono and Maho Yamamoto

#### **Abstract**

Enhancement of visibility for partially obstructed seats at the Kabuki Theatre will benefit both audience and promoters. Generally, the Hanamichi, which plays an important role in various plays, is difficult to see from the second- and third-floor seats. However, no prior research focusing specifically on the visibility of the Hanamichi was found. In this research, we improved the view by placing a mirror on the ceiling of the theatre to reflect the Hanamichi. At the Shinbashi Enbujo Theatre, the Hanamichi is almost invisible from the second and third floor seats, except for the stage on the right side. We modeled the Shinbashi Theatre in 3D using Blender, placed a mirror and took pictures of the view of the Hanamichi from each seat. The conclusion we can draw here is that installing a mirror on the theatre will improve the obstructed views. Designing theaters with fewer visual obstructions will enhance audience satisfaction and contribute to increased theater revenue.

### **Creating Characters Which Gain Popularity**

Yui Hatano and Aoi Hata

#### **Abstract**

This study investigates how generative AI can identify popularity traits within the expanding "otaku culture" to assist in character creation. This study aims to analyze the visual characteristics of popular existing characters using AI models like ChatGPT, Gemini, and Grok, verifying if designs based on identified "popularity factors" can effectively appeal to the public. By analyzing popular character series like Sanrio

and Animal Crossing, we extracted universal features such as "round forms," "pastel colors," and "distinctive looks." These traits were then applied to create three original characters, which were submitted to design contests. We intend to use the results of these contests as evidence to prove the actual demand and popularity of the characters. While direct conclusions cannot yet be drawn as the content results are pending, the findings revealed that popular characters share certain common elements. Ultimately, future character development should focus on both visual and non-visual elements.

### **Development of an Evacuation Route Suggestion System for Ochanomizu Senior High School**

Hikari Funatsu, Riko Machida, and Yuri Ejima

#### **Abstract**

In this study, we developed a system that provides real-time information on the optimal evacuation route from evacuees' current locations in our school building. Previous studies have mainly focused on route finding shelters and general factors that affect evacuation efficiency, but there were few studies that focused on exit selection inside buildings. In this research, we aim to develop a system to reduce overall evacuation time. We utilized Visual Basic for Applications and took into account congestion at the exits. The code we created could suggest the optimal exit from evacuees' current locations and the system enabled faster evacuation compared to conventional evacuation drills. By considering both distance and congestion, the system effectively reduced the evacuation time. In actual situations, there are also risks associated with fire doors or fire smoke. Furthermore, power outages may cause the system to go offline or malfunction. This study may contribute to safe evacuation for people in the disaster-prone countries.

### **A New Personalized Study Planning System Using AI**

Akari Okamoto and Yuma Matsumoto

#### **Abstract**

Today, many students feel that they can't do well about planning when they carry on their homework or self-studying. We focused on making an automatic planning system which enables students to keep studying with motivation referring to "ARCS motivation model", the model about how to keep studying with motivation and finish assignments before the deadline. Students type in their assignments they have to do and the time they can't study such as sleeping or hanging out and the system splits and sorts the tasks and suggests the schedule. The system also learns how long it takes to carry on each assignment and it must improve to build available plans. Finally students choose how satisfied they are with the schedule. The system memorizes it and makes the schedule which is considered to be satisfying for the students by learning the pattern which students tend to like using machine learning.

### **The Concave Polyhedron like Regular Hexahedron**

Shitoka Ikeda

#### **Abstract**

This study investigates the construction of a concave polyhedron composed solely of square faces. Although it has been proven that only five regular polyhedra exist, additional polyhedra resembling regular ones may be constructed if the condition of convexity is removed. In this study, a symmetrical polyhedron

was created and analyzed. The polyhedron was modeled using Blender 4.4, and its regularity and symmetry were examined. The results reveal three main findings. First, its surface area, volume, and the numbers of edges, vertices, and faces could be represented by formulas. Second, through an operation similar to duality, the polyhedron was found to be close to a regular octahedron. Finally, the number of lines of symmetry was shown to be the same as that of a regular octahedron and a regular hexahedron. These findings suggest that it is possible to construct a concave polyhedron with symmetry that resembles a regular hexahedron. Moreover, other types of concave polyhedra similar to regular polyhedra may also be possible.

## **Reducing Egg White Allergenicity by Combining with Other Foods**

Mai Omuro and Riko Taba

### **Abstract**

This study examined the reduction of egg white allergenicity that happens when egg white combined with specific edible ingredients in home cooking. Egg white contains two major allergens: ovalbumin, which is easily changed by heat and ovomucoid, which is heat-resistance. Previous studies have shown that egg white proteins denature when mixed and heated with flour, sugar, or butter. This study aims to create foods including fewer allergens, which may be useful for the first step of oral immunotherapy (OIT). First, we examined the amount of protein when egg white was cooked with these materials using the biuret test. Second, we measured the amount of ovomucoid using SDS-PAGE (sodium dodecyl sulfate polyacrylamide gel electrophoresis). As a result, ovomucoid was denatured in the order of flour, sugar, and butter. Therefore, the protein-insolubilizing property of flour is effective in reducing the allergenicity. We plan to measure ovomucoid more accurately by reacting with antibodies.

## **Development of Immobilized Yeast Gel for Efficient Bioethanol Production**

Anna Ishizashi, Hinata Nakamura, and Riko Matsubara

### **Abstract**

This study investigates how to improve bioethanol production by developing immobilized yeast gel that can maintain high fermentation ability. Currently, bioethanol is gathering attention as a renewable energy source because of global warming and energy problems. Immobilizing yeast in calcium alginate gel enables easy recovery and reuse of yeast cells. The purpose of this study is to clarify why fermentation ability decreases and to determine suitable preparation conditions. In Experiment I, we examined the effects of storage period and repeated use by measuring changes in sugar concentration. In Experiment II, we compared gels prepared with different sodium alginate concentrations (1.5–3.0%) in terms of fermentation activity and yeast leakage. These results show that longer storage reduced fermentation ability. Also, higher sodium alginate concentration decreased yeast leakage and helped maintain fermentation activity. Based on these findings, proper storage and concentration are considered to be important for efficient bioethanol production. Longer continuous fermentation experiments will be required in the future.

## **How to Increase the Foaming Properties of Soybean Extract in Muffins**

Yuka Kuroki and Akari Shimazaki

### **Abstract**

This study investigates how to replace the foaming properties of eggs with soybean extract. Eggs play an important role in helping muffins rise. However, some people are allergic to eggs or follow vegetarian diets. Previous studies have shown that soybean extract is capable of producing foam in muffins. In this study, we explore how to enhance the foaming properties of soybean extract in muffins. We first baked muffins containing animal products such as butter and milk replacing eggs with soybean extract. Next, we changed the heating time of the extract using an animal-free recipe. The results show that it is nearly possible to substitute eggs with soybean extract in animal-based muffins. We found that extending the heating time is effective but not enough. Our conclusion is that it is necessary to improve not only foaming capacity but foam stability. These new findings constitute an important step toward achieving egg replacement in animal-free recipes.

## **Exploration of Salt-Elimination Methods Using Kombu Dashi**

Hinano Someya, Airi Kabashima, and Yuna Wada

### **Abstract**

We investigated a salt-removal method using alginate contained in kombu dashi. Previous research has shown that alginate salts have a salt-removing effect. To utilize alginate for salt removal in food, the viscosity of alginate has to be reduced. Therefore, experiments are conducted with the aim of reducing that viscosity. When the temperature of an alginate potassium solution was increased, its viscosity decreased. Additionally, lowering the pH of the solution resulted in an increase in viscosity, whereas increasing the pH did not decrease it further. We considered that the decrease in viscosity upon heating was due to increased thermal motion of the molecules. Furthermore, since pH changes are related to the dissociation of potassium alginate, we considered that the observed viscosity changes with pH variation were associated with this process. Therefore, we aim to elucidate the relationship between viscosity and dissociation in greater detail.

## **Creating Conductive Fabric Using Polyaniline**

Mio Shigekuni and Alice Tokuhara,

### **Abstract**

Conductive polymers, exemplified by polyacetylene, possess electrical conductivity due to the delocalization of some electrons shared between atoms. We took up polyaniline which can be easily produced and added it to fabric to impart its properties. We expected that we would be able to create new material combining functionality and processability. First, it was found that adding polyaniline [Emeraldine Solt] produced by electrolytic polymerization onto cotton fabric resulted in an electrical resistance value of a conductive degree. Next, to measure the durability of this treated fabric in water, the electrical resistance was measured twice consecutively in both wet and dry states. As a result, it was found that immersing the fabric in water twice caused it to lose its conductivity. Third, the change in resistance by approximately one-fourth was found when we applied force along the diagonal. This confirms that the property of polyaniline, where electrical resistance changes under stress, is also present in the fabric treated with polyaniline.

## **Making Washable Calligraphy Ink**

Yui Hagiwara, Nonoka Nakamine, and Chisaki Yamada

### **Abstract**

In this study, we tried to make ink that can be washed out by replacing glue. Traditionally, washable ink spreads easily because it is made by mixing different colored inks. Therefore, this research aims to make washable ink by using soot, which is the original material of black ink. We mixed soot and water with glue, gelatin, and laundry starch. First, we compared their writing comfort. Then we washed the cloth that was stained with these inks with a mixer and checked how much ink was removed. As a result, the ink with gelatin became like jelly. However, there was no big difference in writing comfort between glue and laundry starch, and more ink was removed after washing when we used laundry starch. These results suggested that we may be able to make ink that is easier to wash out by using laundry starch. In the future, we would like to study the relationship between the concentration of laundry starch and how easily the ink can be removed.

## **Increasing the Transparency of Biodegradable Plastics**

Tamaki Takamura, Aina Haraguchi, and Sonoka Fukushima

### **Abstract**

Recently, biodegradable plastics have become more common, but their low transparency limits their use in items like cups. To address this, we investigated alginate gels, which are both biodegradable and highly transparent. We tested six types of gels by adjusting solution concentrations and metal ion valency to find the best balance of strength and transparency. The results showed that the two samples with the highest sodium alginate concentrations achieved high levels in both transparency and strength. Next, we recreated the two superior gels with the same size and thickness and evaluated them more accurately. We produced calcium alginate gels by changing the concentration of calcium chloride solution. Higher concentrations showed higher strength and lower transparency. These results suggest that changing the density alters the characteristics, and we can make biodegradable calcium alginate plastics by setting the density properly. We will apply these methods to create actual plastic items from the gels and conduct detailed evaluations.

## **Extending the Shelf Life of Meat through Aging**

Haruka Shimizu and Hanaka Ichimura

### **Abstract**

This study was conducted to examine whether aging can extend the shelf life of meat in a simple way at home. The expiration date of fresh meat is usually about one week, and compared to other foods, it is relatively difficult to preserve for a long time. Therefore, we aimed to find an effective storage method. In this experiment, pork cut into 2 cm cubes was divided into three groups: wet aging, dry aging, and storage in its original packaged condition. The samples were stored for one to three weeks. After the storage, we observed their appearance, smell, and texture. The samples were also diluted and examined under a microscope. Then we observed the structure of the meat tissue. In particular, the dry-aged samples showed less decomposition. Therefore, dry aging may be an effective method for extending its shelf life. In the future, we plan to use a higher magnification microscope to observe bacteria as well.

## Investigation of Hair Care Effects Using Mandarin Orange Peel and Yusuru (Rice Water)

Marica Ikukawa, Honoka Fukuda, and Luca Fukagawa

### Abstract

This study investigates a sustainable hair care method using mandarin orange peel and Yusuru (rice water) to address hair damage from chemical coloring and food waste. We treated hair samples with various extracts and evaluated them through blind sensory tests and microscopic observation. Experiments showed that albedo-free citrus extracts smoothed hair cuticles and improved tactile quality. Conversely, albedo worsened texture due to pectin. Results also indicated that heat-drying outperformed air-drying, while improper emulsification led to ingredient clumping rather than the uniform distribution necessary for coating. In conclusion, effective hair repair requires removing the white inner peel and ensuring precise timing of emulsification with lecithin. Future research will focus on improving extraction efficiency and the reproducibility of these results to enhance practical application.

## Why *Alternanthera Philoxeroides* Has the Strong Reproductive Ability

Ayaka Eto, Iroha Morimoto, and Juri Sakaguchi

### Abstract

This study investigates what characteristics contribute to strong reproductive capacity of *Alternanthera philoxeroides*. Especially, we observed root adaptation to the environment. It is a designated invasive alien species that rapidly spreads in various environments in Japan, causing serious ecological impacts. This study aimed to contribute to the factors underlying its strong reproductive ability, called Phenotypic plasticity. We hypothesized that the plant can change its root with each environment. We grew a cut mint stem instead of the plants under two controlled conditions, hydroponic culture and soil culture. The results show that hydroponically grown plants formed longer roots. In addition, taproots of soil-grown plants formed as thin as their lateral roots, and thinner than hydroponically grown plants. These findings suggest that in soil, roots do not need to be long and thick to provide sufficient strength if they spread extensively. As our future work, we will examine the same research more carefully with other plants, which more relates to *Alternanthera philoxeroides*.

## Composting at Home to Reduce Food Waste

Honoka Koyama and Yuzuki Naka

### Abstract

The purpose of this study is to reduce CO<sub>2</sub> emissions and enable recycling by utilizing food waste as a resource through composting instead of incineration. Our compost method was putting food waste into soil inside cardboard boxes or tote bags, where we observed the decomposition process. The result shows that if compost were used in households in Tokyo, it could lead to a 15.9% reduction in household waste. From this, it is estimated that if all of Tokyo used compost, about 1,078 tons of food waste per day could be avoided from incineration and potentially reduced approximately 410,000 tons of carbon dioxide annually. The findings imply that using compost is a method with significant potential for reducing carbon dioxide. Looking ahead, we would like to verify the effectiveness of compost as fertilizer by growing plants.

## **Long-term Preservation of Water Using Lactic Acid Bacteria**

Chinatsu Nagayama and Miyu Mochizuki

### **Abstract**

This study investigates using lactic acid bacteria (LAB) to prevent harmful bacterial growth in drinking water. The research was motivated by the frequent waste of unfinished bottled water. Therefore, this research aims to identify the optimal conditions for preserving water using yogurt as a source of LAB. In the first experiment, we examined which temperatures effectively prevent the proliferation of harmful microbes by placing water with LAB in various environments. In the second experiment, we tested the necessary amount of LAB by adding yogurt ranging from 0 mg to 200 mg per 100ml of water with starch. The result showed that at 30°C, adding at least 50 mg of yogurt suppress harmful bacteria. Consequently, we concluded that adding at least 4.85 million LAB per liter of water can prevent bacterial growth under specific thermal conditions. Finally, future research should examine safety beyond two weeks and clarify the specific antibacterial components.

## **How Environment Conditions Affect Pill Bug's Rolling Up**

Mayu Sawada and Yuki Nunokawa

### **Abstract**

Though it is a common behavior for pill bugs to roll up, there is not so much previous research. Also, they live everywhere, which makes research more feasible. The final purpose of this research is to reveal pill bugs' cognitive conditions. In our experiment, we observed their behavior in the soil on various environmental conditions separately and saw what are the biggest factors which make them roll up. Consequently, we found that they opt to be affected by humidity the most. Also, we found that they are more likely to get into the soil when the temperature is low and the soil is wet. We think that pill bugs prefer getting into the soil to rolling up. In conclusion, they roll up when they can't get into the soil. However, low temperatures and wet conditions would make them go underground rather than rolling up. In the future, we intend to classify their physical features and analyze those relations.

## **Do Zebrafish Have a Favorite Color?**

Yu Tatsuwaki and Riko Yoshimoto

### **Abstract**

This study investigates the color that zebrafish favor. Previous studies have shown that zebrafish can distinguish red, blue, green, and ultraviolet rays. Here we show whether zebrafish react differently to a particular color. For our study, we first collected data by placing each zebrafish in an aquarium and observing its reaction to three kinds of colored lights. Second, we also put all four zebrafish in the aquarium and conducted the same experiment. The results showed that there were variations in each zebrafish's response to colors. They suggest that there is no color preference in zebrafish as a species, but each zebrafish has a favorite color. We have now concluded that the preference of each zebrafish influenced the group's behavior. In future studies, we may get more accurate results by considering the area that zebrafish swam and the direction of movements.

## The Role of the Snail Shell Maintained Through Evolution

Mihiro Minamide, Rio Muto, and Mana Murata

### Abstract

This study examines why the spiral structure of the snail shell has been maintained through evolution, focusing on water retention. Two experiments were conducted. In the first experiment, evaporation was measured under different conditions. A real snail shell and a 3D-printed hemisphere of the same size were used. Slime and cotton were placed inside each structure. The results showed that the difference in evaporation between the shell and the hemisphere was smaller when cotton was used than when slime was used. To investigate this result, simplified models were prepared and their mass changes were measured over time. The results showed that the surface area affected evaporation. Finally, it was concluded that the spiral structure reduces surface area exposed to air and helps retain water effectively. In future experiments, materials with higher viscosity than slime should be used to improve accuracy. This will clarify the role of shell structure further in evolution.

## Balancing Waste Deodorization and Eco-Friendliness

Rika Fukuda, Yuzuki Oshii, and Kokose Hayakawa

### Abstract

This study investigates the development of a sustainable bio-deodorant using *Solidago altissima* to reduce urban waste odors while minimizing environmental impacts. To address odor pollution in densely populated cities, we evaluated its deodorizing efficiency against other common materials, building upon previous findings regarding its inhibitory effects on methyl mercaptan. In Experiment I, food waste was mixed with various substances, including commercial deodorants, coffee grounds, apple peels, newspapers, and orange peels. After measuring methyl mercaptan levels, we found that *Solidago altissima* outperformed all other groups. Experiment II compared different processing methods: raw plant material, liquid extract, and powder. The powder form showed the highest efficacy, likely due to its increased surface area for adsorption. These results suggest that *Solidago altissima* is an effective and eco-friendly solution for waste management, with potential for future commercial development.

## The Potential of Alum for Sterilization

Shion Miyagi and Risako Furui

### Abstract

This study verifies whether alum could be used to disinfect hands instead of ethanol. We focused on the way alum works on bacteria, instantly and constantly. We saw plenty of people getting their skin irritated after ethanol disinfection especially while and after COVID-19 pandemic. Therefore, this study aims to help those people. The previous research shows that alum has a deodorant effect and already be used for soap. In this study, we cultivate staphylococcus aureus, a bacteria which commonly found on human skin, for days and weeks. Then, we compare the one with nothing, another with ethanol and the other with alum. The result showed that alum has the ability to prevent proliferation of bacteria. However, there are still more doubts about whether it can sanitize enough for practical use. Based on these results, we reached the conclusion that it is difficult to replace ethanol for sanitizing by alum.

## **Verifying the Anti-vibration Effect of Paper Springs in Food Delivery**

Shizuka Osada, Saki Echizen, and Tomoka Taniyama

### **Abstract**

This study investigates the vertical vibration reduction effects during food delivery by using bellows-shaped paper springs. Recently, food delivery has become increasingly prevalent; however, food items are occasionally damaged by vibration during delivery. To deal with this problem, this study explores the vibration reduction of these springs which are cheaper and lighter than conventional vibration-proof devices. In our experiments, we prepared three types of devices with different fold widths: 2 cm, 3 cm, and 5 cm, and tested them with 300 g and 500 g weights. Then, we subjected these devices to vertical vibration and measured the vertical acceleration. The results showed that the device with a 3 cm fold width with a 300 g weight reduced vibration more effectively than the other two. The results suggest that the device with a 3 cm fold width can be used in food delivery for 300 g items. This finding will lead to the practical application of paper springs in food delivery.

## **A GIS-Based Study on Inland Flood Mitigation in the Tokyo Metropolitan Area -Referring to the Example of the Niigata River Basin in Koshigaya City, Saitama-**

Miharu Sasaki, Sae Otsuki and Momoka Noguchi

### **Abstract**

This study examines how combining “self-help” by residents and “public help” by the government can reduce inland flooding in the Tokyo metropolitan area. We focused on the Niigata River basin in Koshigaya City and analyzed the area using GIS. First, we estimated the amount of above-floor flooding based on a hazard map. Then, we calculated a more accurate flood volume using mesh analysis. The results showed that about 40% of the total floodwater could be reduced if 45,000 households store rainwater. The remaining water could be managed by small detention ponds. Therefore, both household action and public facilities are important for flood control.

## **Estimating the Appropriate Number of Toilets in Evacuation Shelters Using Queueing Theory**

Rurina Aramaki and Shiho Ueno

### **Abstract**

The Sphere standards determine the required number of toilets in evacuation shelters based on the number of evacuees and do not take into account differences in usage time depending on toilet type. In this study, queueing theory was applied to estimate the required number of toilets, incorporating this factor. The results showed that immediately after a disaster, when the average usage time per person is longer, more toilets are required than in later phases, differing from the Sphere standards. In addition, when the number of evacuees is less than 150, the Sphere standards estimate a greater number of toilets. However, as the number of evacuees increases, the opposite trend is observed. Furthermore, when morning congestion is considered, the required number of toilets exceeds the Sphere standards regardless of shelter size. These findings suggest that queueing theory is useful for estimating the required number of toilets according to detailed situational conditions. Future research will examine longer-term scenarios to evaluate its practical applicability.

## **Verification of Damage Detection with Piezoelectric Sensors**

Ayana Yoshida and Rin Nakai

### **Abstract**

Non-destructive detection is essential for quality management, but it is uncommon due to its high cost. This study aimed to establish a damage detection system of acrylic plates with piezoelectric elements, which are inexpensive and require no power supply. In experiment 1, piezoelectric elements were attached to cardboard and subjected to a controlled impact. The resulting voltage waveforms varied with conditions, suggesting that piezoelectric elements function as sensors. In experiment 2, we compared normal, overall damaged, and locally damaged acrylic plates. Overall damage increased amplitude and fall time and decreased coefficient of variation (CV) for the rise time. In contrast, local damage exhibited little change in amplitude or fall time, but increased CV for the rise time. Results indicate that a few inspections can detect overall damage, while the detection of local damage requires repeated measurements. Further research will explore approaches that detect local damage in fewer inspections and verify this system's effectiveness across other materials and composite structures.

## **Commercial Influence on a Region by Creating Stories of Local Products**

**-A Pilot Study Conducted at Sedette Kashima in Minamisoma City, Fukushima Prefecture, Japan-**

Miho Nishimura, Sara Ogawa, and Rio Inoue

### **Abstract**

The population of Minamisoma City declined from 2010 to 2020. This study aimed to promote local economic revitalization by using "Sedette Kashima," a central hub facility in the city, as a base. We proposed two hypotheses: adding local culture and stories to products would increase sales, and providing tourists with information about local attractions would encourage them to visit other facilities. After installing promotional POP that introduced the background and cultural value of products, sales increased at a rate higher than the growth in visitor numbers. This suggests that storytelling can positively influence purchasing behavior. In contrast, distributing maps to promote other facilities didn't significantly improve customer traffic.

## **The Effects of Installing a Cylinder on Air Circulation in a Private Room in an Evacuation Shelter**

Akari Sato, Chiaki Morita, and Terra Morimoto

### **Abstract**

This study investigates how a cylinder affects air circulation inside the shelter. Creating individual rooms with partitions for privacy protection reduces air circulation. This research aims to improve this situation and prevent the spread of infection. We made a model of shelter and filled it with smoke. We changed the thickness of the cylinder and its installation position to compare how well smoke escaped from each room. Placing a thin cylinder at the entrance to the shelter was the best way to remove the smoke. It is thought that the wind blowing into the shelter and hitting the cylinder created turbulence, making it easier for the wind to enter the private rooms. It will be necessary to increase the number of experiments to improve accuracy. In addition, conducting multiple experiments under different conditions, such as changing the number of cylinders, will lead to finding the most efficient method of air circulation.

## Enhancing the Efficiency of Savonius Turbine by Riblet Surface Texturing

Mami Iwamoto and Yuna Bamba

### Abstract

Renewable energy has been widely considered crucial in Japanese power generation, but Japan does not fully utilize its abundant water resources. Therefore, we focused on tidal power generation, which can make use of Japan's vast ocean areas and has the potential to become a stable energy source in the future. The purpose of this research is to improve the efficiency of a tidal turbine by stabilizing its rotation through surface modification of the blades of the savonius turbine, which could be applied to deep sea or river current power generation. In this research, we conducted experiments by simulated riblets on blades and measured drag coefficient. The results show that deeper riblets enhance the performance, which indicates the possibility of improvement in efficiency of turbine spin. To solidify the results, it is essential to collect more data as well as consider actual underwater environments.

## Development of a Whipped Cream Alternative

Karen Asai and Yuhi Aoki

### Abstract

Recently, dairy alternatives have attracted considerable attention due to growing concerns about animal welfare and food allergies. In this study, we aimed to develop and evaluate a plant-based whipped cream alternative using coconut oil and oat milk. Five experiments were conducted with different formulations, including a dairy cream control. Each sample was mixed using a hand mixer and evaluated by measuring air content. Only one formulation consisting of coconut oil, oat milk, and gelatin produced a cream-like texture, while the others failed. Notably, the fully plant-based formulation in which gelatin was replaced with agar did not produce a cream-like structure. The experimental sample showed an air content of 10.7, compared with 68.2 for dairy cream. These results suggest that oat milk has potential as a dairy cream alternative and show the important role of gelatin in forming a whipped-cream-like structure. Future work will focus on improving stability by testing emulsifiers such as xanthan gum.

## Is the World of *Charlie and the Chocolate Factory* Possible?

Niko Konishi, Ami Kato, and Mahiro Okita

### Abstract

This research explores whether the fantasy world of *Charlie and the Chocolate Factory* can be recreated using real scientific methods and materials. Inspired by the film, the study focuses on reproducing the river and grass textures shown in the movie while considering sustainability. Chocolate alone and chocolate mixed with milk were tested as base materials to compare differences in fluidity and strength. Experiments showed that pure chocolate is suitable for structures requiring strength, while a chocolate milk mixture provides softness similar to soil. For recreating grass texture, cotton candy and spring roll wrappers were compared. Cotton candy melted quickly and could not maintain its shape, whereas thinly cut spring roll wrappers successfully preserved texture and form. Although some limitations in experimental accuracy remained, the results suggest that the fantasy environment is scientifically reproducible. Furthermore, this research will explore the use of recycled materials and food waste to recreate similar textures and strength with lower

environmental impact, contributing to sustainable design and material innovation.

## **Differences in Advertising Expression across Five Media**

Yura Funahashi and Mayako Nogami

### **Abstract**

This study examines how advertising formats are adapted to the characteristics of five media platforms: Instagram, X, YouTube, LINE, and Television. Numerous studies have shown that ad styles vary significantly based on how users interact with each medium. We collected 50 advertisements from each of the five media and analyzed them. The findings reveal distinct strategies for each platform. Instagram focuses on visual aesthetics while X leverages real-time trends. YouTube ads prioritize capturing attention within the first five seconds, whereas LINE utilizes its role as a daily communication tool for personalized targeting. Conversely, Television is a primary medium for building broad social credibility. The study concludes that successful ads are optimized to reflect the user behavior of each platform; whether it is active or passive. Going forward, we aim to propose advertising strategies to companies, identifying which industries should use which media and what specific ad formats they should adopt.

## **Comparison of Comfort Depending on Furniture Arrangement**

Ai Nojiri and Yuki Ikegami

### **Abstract**

This study investigates how furniture arrangement affects spatial comfort through quantitative comparison. Since comfort is a subjective and abstract concept, the research focuses on a room as a familiar space where conditions such as size and amount of furniture can be easily controlled. Multiple furniture layout patterns were created under identical room conditions and evaluated using several indicators, including the distance from the entrance to the nearest furniture, visible volume, remaining usable area, and the pseudo-neglect effect. The results showed that even when the room size and furniture quantity are the same, differences in furniture arrangement lead to variations in perceived spaciousness, openness, and usability. These findings suggest that spatial comfort is not determined solely by physical dimensions but is strongly influenced by visual and functional characteristics created by layout. Therefore, furniture arrangement can be considered as an important factor in shaping the spatial qualities of a room, and layouts that enhance visual openness and efficient use of space are likely to contribute to a more comfortable environment.

## **A Comparative Study on the Adhesion Strength of Mineral Pigments with Different Ratios of Animal Glue**

Kasumi Ikeda

### **Abstract**

This study aims to clarify how the mixing ratio of mineral pigments (iwa-enogu) and animal glue (nikawa), which are used in traditional Japanese painting, affects adhesion strength. Animal glue functions as a binder that fixes pigments to the support surface, and its proportion is considered to significantly influence both the durability and the final quality of the artwork. In this experiment, multiple samples were prepared by

gradually varying the ratio of glue to pigment. Each sample was applied to a standardized support and dried under identical conditions. Adhesion strength was evaluated through abrasion and peeling tests by comparing the degree of pigment detachment. The results showed a general tendency for adhesion strength to increase as the proportion of the animal glue increased. However, it was not possible to determine the exact ratio that produced the highest adhesion strength. Furthermore, excessive amounts of glue may negatively affect surface texture and workability. These findings suggest that identifying an optimal balance between pigment and binder is essential to achieve both strong adhesion and desirable artistic qualities.

## **Effective Use of the Technique of Stroke Division by Combining Colors**

Hanako Uemura

### **Abstract**

This study examines how the combination of colors in the technique of divisionism affects visual effects. The focus is how the difference in brightness (value) and saturation affects the visual color mixing. Red and blue were selected, and the brightness and saturation were adjusted. Both digital (iPad) and analog (paper) methods were used for comparison. The work was analyzed based on chromaticity, brightness, and saturation. The results show that digital methods and analog methods produce different mixed effects. In addition, the greater the difference in brightness, the more difficult it is to create a mixing effect, and it is necessary to look at it from afar. These findings suggest that contrast and saturation of brightness are important for the effective use of Divisionism.

## **The Relationship between Types of Exhibits and Display Conditions**

Tamaki Osaku

### **Abstract**

Museum exhibition design requires various forms of careful consideration. However, its effectiveness is often evaluated based on curatorial experience or intuition, and systematic research demonstrating its relationship with physical conditions remains insufficient. Therefore, this study aims to clarify the relationship between the types of artifacts, namely their physical characteristics and exhibition design. To achieve this objective, thirty-five objects displayed at the Tokyo National Museum were observed and analyzed with a focus on display height and lighting conditions. The results indicate that display heights were generally standardized to align with viewers' eye lines, while lighting conditions were adjusted according to material properties such as reflectivity, texture, and three-dimensionality. These findings suggest that exhibition design does not rely solely on aesthetic sensibility but is structurally organized to enhance visibility based on material characteristics. Consequently, by empirically demonstrating this relationship, the present study provides a foundational perspective for evaluating exhibition design in a more objective manner.

## **The Relationship between the Positions of Benches and User Selections in Parks**

Rinko Natsume

### **Abstract**

In this research, I studied what factors make park benches comfortable and how these factors affect the number of users. Parks are valuable places because anyone can use them for free at any time. I became interested in how to make these spaces even better. I chose five benches in Inokashira Park. Based on previous studies, I checked five points: sunlight, access, the direction of the walking path, things that block the view, and objects to watch. I recorded the occupancy rate of each bench. The results showed that easy access had the biggest impact on the occupancy rate, followed by having something to watch and sunlight. Also, I found that benches with a walking path in front and a screen behind them were more popular. Since this was an outdoor study, the weather might have affected the results. A full-year survey will be necessary.

## **Analysis of Seat Selection in University cafeterias**

Haruka Hirano

### **Abstract**

This study looks at why students choose certain seats in university cafeterias. Many people think window seats are popular because they have a good view. However, in this search, I focused on the walking distance from the entrance to seats. I conducted a survey at seven campuses of five universities in Tokyo. The results showed a strong relationship between walking distance from the entrance to seats and seat usage. This means that when the distance to window seats is longer, fewer people use them. I found that 15 to 17 meters is a psychological boundary. If the distance is longer than this, students feel it is too far to walk and choose other seats. In conclusion, for many students, the ease of reaching a seat is more important than a good view. To improve cafeterias, we should think about how to make it easier for people to reach window seats.

## **Enhancing the Strength of Soil-based 3D Printer Materials by Reusing Textile Waste**

Yuna Inoue and Kanade Shoji

### **Abstract**

We try to enhance the strength of 3D printed house whose main material is soil by using textile waste as reinforcement. 3D printed house has been becoming increasingly important as a circular building model. Nevertheless, its insufficient strength is an unresolved issue. This study aimed to enhance its strength by reusing textile waste and investigate its optimal mixing ratio. Before the experiment, the samples cracked when the ratio was 0% and 0.2% in drying process. The results showed that its strength increased as the fiber content increased in our experiments and its strength reached the maximum when the mixing ratio was 0.6%. Following the above, it may be possible to prevent cracking and make its strength stable by conversing the fiber-soil ratio. These findings are an important step toward improving 3D printed house's strength and promoting its construction.

## **Examining Common Features of Appreciated Library Architectures**

Sachi Yokoi

### **Abstract**

This paper aims to investigate common features of library buildings highly acclaimed for their facilities and architectures and seeks to analyze comfort of facilities in libraries. Previous studies have shown that library furniture, building structure, furniture arrangement such as bookshelves, how to get sunlight, illumination, and atmosphere of space affect the environment in libraries. Therefore, I selected and visited Itabashi City Central Library, Omiya Library, Yui no Mori Arakawa, Mizuho Town Library, and Minami-Nagareyama Regional Library from among libraries that have won The Library Architecture Award of JLA, Public Buildings Award, or Good Design Award, and created and considered indicators for library furniture, buildings designed for long stays, layout, and lighting. The results show that all of viewpoints without furniture have common features. My results highlight the importance of using some furniture adopting each environment and needs and elements used as indicators of layout. Also, it is concluded that building design for long stay and lighting have to do with comfort.

## **Does Mozart's Music Make even the Sweet Potatoes Taste Better?**

Jaku-un Shu and Konoha Kato

### **Abstract**

The music of Wolfgang Amadeus Mozart, a composer in the 18th century has long been associated with effects such as relaxation, improved concentration, and even benefits for infants. This report explores the seemingly metaphorical question: does Mozart's music make even the stars taste better? Through this question, we examined how music may influence human perception, particularly the sense of taste. Recent research in psychology and neuroscience suggests that hearing and taste interactive with each other: for example, high-pitched sounds are often associated with sweetness. We prepared two kinds of sweet potatoes: one that had been exposed to Mozart's music and another that had not been exposed to any music. We then dried both types to make dried sweet potatoes and compared them under the same conditions. For this experiment, we selected several well-known piano sonatas by Mozart and played them continuously for one week. Then, we conducted an experiment in the laboratory to measure the sugar content by using Benedict's solution. The results showed that the dried sweet potatoes exposed to Mozart's Music contains a higher sugar content than those that were not exposed to music. In future research, we plan to examine whether music by other composers and pop artists produces similar or different effects compared to Mozart's works.

## **Prevent "IT'S ME" Scam Using Voice Identification and Dangerous Word Detection**

Rise Kato

### **Abstract**

"IT'S ME" scam is a phone scam in which criminals pretend to be a family member and ask elderly people to send money. In Japan, this fraud has become a serious social problem. Many victims are deceived because the caller sounds believable and uses urgent words that make them panic. In this study, I designed a system to prevent this fraud by combining voice identification and dangerous word detection in a smartphone app. First, I recorded several people's voices and examined features such as pitch, volume, speech speed, and

pause length. These features were changed into numbers to compare each person's voice. Next, speech was converted into text, and I checked whether it included predefined dangerous words. If four or more dangerous words were found, the call was judged as suspicious. The results showed that voice features differed between individuals and that word detection could identify risky conversations. These findings suggest that combining both methods in an app may help users notice fraud more quickly and reduce future victims.

## **What Are the Principles of Persuasive Speaking?**

Toko Sunohara and Yuki Mizumura

### **Abstract**

This study explores the cognitive abilities necessary for effective public speaking. Given the increasing opportunities for public presentations, the ability to articulate ideas clearly and memorably has become imperative. Therefore, the present study analyzes comprehensible speeches and establishes evaluation indices to examine which vocal elements most strongly influence audience assessment. Initially, the evaluation indices derived from prior research were examined to ascertain their suitability through an analysis of the speech patterns of six Japanese announcers selected as exemplars of proficient speech. Pitch was measured using the standard deviation from the mean of the frequency values, while pause ratio and average pause length were calculated from the silent time. Speech rate was defined as words per second. Similar patterns were observed across all newscasters, and several findings were consistent with prior research, indicating the appropriateness of these indices for speech analysis. In subsequent research, an experiment will be conducted to investigate the correlation between objective evaluation indices and audience ratings presenting manipulated audio samples.

## **An Examination of Alarm Clock Making Horrible Noise**

Narumi Joba

### **Abstract**

Numerous studies have reported about pleasant-unpleasant sounds in living environments and sound cognition aspects. These studies have shown that pleasant sounds contain of musical sounds, biological sounds, everyday life sounds and natural sounds, whereas unpleasant sounds contain of mechanical sounds, human sounds, signal sounds, artificial sounds like pure tones and noise and scratching sounds. In this paper, I investigated the effect of using an unpleasant sound for an alarm clock. First, I picked up some pleasant-unpleasant sounds from previous studies and analyzed them. Also, I conducted a wake-up experiment to assess the effectiveness of pleasant and unpleasant sounds as alarms when used for waking up. The results showed that unpleasant sounds have a tendency to accelerate the speed of awakening, high discomfort feelings when we wake up, and no correlation with work efficiency immediately after waking up. Furthermore, I divided unpleasant sounds into groups based on previous research, investigated which kinds of groups' unpleasant sounds are the most effective as an alarm clock. It is found that high-frequency scratching sounds are the most effective. The result suggests setting up scratching sounds and some sounds that have features like this as your alarm clock will provide a more effective wake-up experience, contributing to the development of nighttime alarm sounds.

## **The Characteristics of Fujiwara no Kinto's Waka Poems**

Mirea Toki

### **Abstract**

This study investigates what property Japanese classic poems by Fujiwara no Kinto have. Numerous studies have researched his traits of waka poems. However, his self-made waka poems have not been fully explored. Therefore, this paper seeks to analyze the characteristics by comparing them with earlier ones. First, I collected waka poems about spring flowers from “The Wakan Roei Shu” compiled by him and “Kinto-Shu”, which is a collection of his waka poems. Then I assessed the frequency of words and researched examples of their use. The results showed that “Kinto-Shu” has more distinctive words such as “flower” and “fall” than the other. Furthermore, many waka poems from “Kinto-Shu” describe the situation where some people couldn't see flowers. I conclude that his waka poems are used in some subjects and situations which are different from earlier ones though he insisted on the importance of earlier works. These findings will help researchers to better understand his waka poems.

## **What Are the Features of Appealing Science Fiction Novels? —Through an Analysis of the Hoshi Shinichi Award-Winning Novels—**

Mirai Onuma

### **Abstract**

This study investigates the elements that make recent science fiction novels appealing through the Hoshi Shinichi Award, a literary award that seeks novels written based on scientific thinking, in order to guide future applicants. To achieve this, its Grand Prize-winning works from 2020 to 2024 were selected as research samples because they can be regarded as representative examples of appealing science fiction. Accordingly, the purpose of this study is to clarify the common characteristics of these works. The methods include impression trend analysis, analysis of work-specific vocabulary, and close reading to examine similarities and differences. The results show strong connections to social issues, especially environmental problems, and indirect emotional expression through internal descriptions, physical reactions, and scene descriptions. Furthermore, fictional worlds sound realistic through SF neologisms and concrete temporal and spatial settings. Therefore, recent appealing science fiction is characterized by social themes, implied descriptions, and realistic world-building. Finally, future research will verify these findings through creative practice.

## **An Examination of Minamoto no Sukemichi, a Character in the Sarashina Diary**

Aoi Miyamoto

### **Abstract**

This study investigates the character of Minamoto no Sukemichi in Sarashina Diary and explores how his image is connected to the main theme of the work. In historical records, Minamoto no Sukemichi is known as a high-ranking noble who was talented in poetry and music and enjoyed a refined court life. However, in the diary, he is not described as a glamorous or romantic figure. Instead, he appears as a serious, honest, and calm man with a mature personality. To understand this difference, this study compares him with the author(the daughter of Sugawara no Takasue)'s husband and also examines expressions used in Yoru no Nezame, which the same author wrote, and The Tale of Genji, which she admired deeply in her youth.

Through these comparisons, the paper argues that Minamoto no Sukemichi does not represent the bright and exciting world of fiction. Rather, he becomes a turning point that shows the author gradually separating herself from the romantic world of stories and moving toward a more realistic and religious way of life.

### **How to Describe Characters in Japanese Works into English – through the Analysis of “Botchan”**

Chiharu Hattori

#### **Abstract**

This paper is an initial part of the research which aims to translate “Role language” into English with more precision. First of all, “Role language” is Japanese specific wordings. When we hear them, we can think of a specific character. Previous studies have shown that these are one of the fascinating points of Japanese works, but difficult to translate. Therefore, this paper sought to analyze them to find the ways to translate. I assumed it is necessary to understand the intention of the author about characterization for translation, and that they can be read from the character’s wordings. If it is true, the results of analysis about character’s wordings would correspond to description about characters in the works. Then, I researched three characters from “Botchan” (which I can read both of Japanese and English on the internet). The result showed that the descriptions of the characters in Japanese and English were matched and the translator’s understanding of the characters were reflected. In future research, I will search for the way to translate which can make use of this result finally.

### **What People Who are Raising Children Need in a Third Place**

Fuka Sato, Shizuka Hayashi, Momoka Oki, and Mizuki Tomisaka

#### **Abstract**

This study investigates what features make a comfortable place for people raising children. A “third place” means a place other than home (the first place) and work or school (the second place). Previous studies have shown that stay-at-home mothers often find it hard to feel a sense of purpose except childcare, and that identity is supported by other roles than being a mother, such as work, and that a third place can support one’s identity. However, little attention has been devoted to third places for people without jobs. This research aims to contribute to creating places that enhance the well-being of parents raising children in the future. Interviews were conducted with users and organizers of a childcare support group about their activities and feelings there. The results suggest that this place functions as a third place. It also seems to provide some sense of achievement usually gained in a second place. In addition, unlike typical third places, it is closely connected to the first place (home).

### **Why “Can’t People Stop Watching”?**

**– The Relationship among Display Features, Functional Differences and Prolonged Video Viewing –**

Risa Ogura, Hitomi Sano, and Haruna Hirano

#### **Abstract**

This study examines how the display features and functions of TikTok and YouTube are related to prolonged video use. Recently, it is a problem that young people watch videos for a long time. This research

aims to propose an app specification to solve this problem. We made hypotheses based on previous study and conducted a survey. The results show that automatic playback on launch of TikTok has certain positive evaluation as a reason of prolonged watching of TikTok. The group that uses TikTok more highly evaluated the search function in comment section of TikTok compared to those who uses YouTube more. More than half answered the time of TikTok to scroll to the next video is shorter than that of YouTube shorts. One possible specification is to allow users to disable automatic playback and the research function in comment section. Also, there is a need to conduct further research targeting wider samples.

## **A Comparative Study of Distribution Control Regimes for Managing Militarily Convertible Drones -Focusing on Export Controls in Japan, the United States, and Europe-**

Miyu Dobashi

### **Abstract**

This study aims to prevent the military diversion of dual-use items, particularly drones, through a qualitative, comparative analysis of security export control systems in Japan, the United States, and the European Union. Military diversion incidents have been reported as regulatory frameworks have failed to keep pace with the rapid development of dual-use technologies. However, few studies have conducted cross-national evaluations of these systems. Therefore, this study develops an original evaluation criteria based on two core functions of export controls: deterrence and information sharing. The results show that all three possess a certain level of deterrent capability, with the United States demonstrating the strongest effect through rigorous post-export monitoring and continuous oversight. In contrast, Japan faces challenges in post-export management. Also, the European Union primarily contributes by establishing institutional foundations. These findings highlight the importance of designing export control systems that balance deterrence and effectiveness. This study provides policy-relevant insights for improving Japan's export control system.

## **Ways to Improve Animal Exhibits to Reduce Repetitive Behaviors - Interviews with Staff at Tama Zoological Park -**

Yuna Tajima

### **Abstract**

This study explores the effects of "Landscape Immersion," a zoo exhibit technique that recreates natural environments, on animal behavior and welfare. While this method is gaining attention, its practical effectiveness remains under-investigated in Japan. The purpose of this research is to clarify how exhibit designs can reduce stereotypical behaviors, which are indicators of poor welfare. I conducted an interview with a veterinary counselor at Tama Zoological Park, known for its pioneering "Safari-style" and mixed-species exhibits. The results revealed that while naturalistic environments encourage species-specific behaviors, animals quickly adapt to changes, potentially leading to a return of stereotypical behaviors due to boredom. Therefore, I argue that the essence of environmental exhibits lies not just in the physical layout, but in providing continuous "change" to prevent boredom. Future research should address the gap between visitor satisfaction and animal well-being to develop stress-free environments for all zoo animals.

## **A Comparative Analysis of the Costs Associated with the Choice of Surnames at Marriage**

Sae Hosokawa, Yuzuki Kurihara, and Tokiko Matsumoto

### **Abstract**

This study examines the social and financial costs associated with changing surnames at marriage from a comparative international perspective. In Japan, married couples are legally required to share a single surname, which is a system that has raised concerns regarding gender equality and individual choices compared with countries that allow to have separate surnames. The purpose of this study is to clarify the financial and administrative burdens of changing surnames and to assess their broader social implications. We compared legal systems across several countries and analyzed document revision costs, procedural complexity, and potential career impacts. The findings indicate that changing surnames generate not only direct financial expenses but also indirect costs such as time loss and professional disadvantages. These burdens tend to fall disproportionately on women, suggesting structural inequality. Therefore, introducing an optional separate-surname system may help reduce gender inequities and administrative burdens.

## **A Study on the Speed of Spread of Military AI Drone Technology and Public Interest**

Yui Yoshida

### **Abstract**

This study examines the "pace gap" between military AI drone development and social oversight to prevent technology from outpacing democratic control. To achieve this, the logistic equation was employed to compare cumulative data from patents, academic papers, and search queries, thereby quantifying the "lag" between these domains. Contrary to the initial hypothesis that public interest is insufficient, the results suggest that technological progress has not yet caught up with high societal concern. Furthermore, this indicates that a critical window for establishing legal frameworks still exists. However, the current data relies solely on English-language searches, leaving trends in non-English speaking regions uncaptured. In addition, since it remains unclear whether search spikes reflect positive expectations or ethical concerns, sentiment analysis should be implemented in future research. In conclusion, refining these models is essential to ensure that technological maturity does not bypass social consensus.