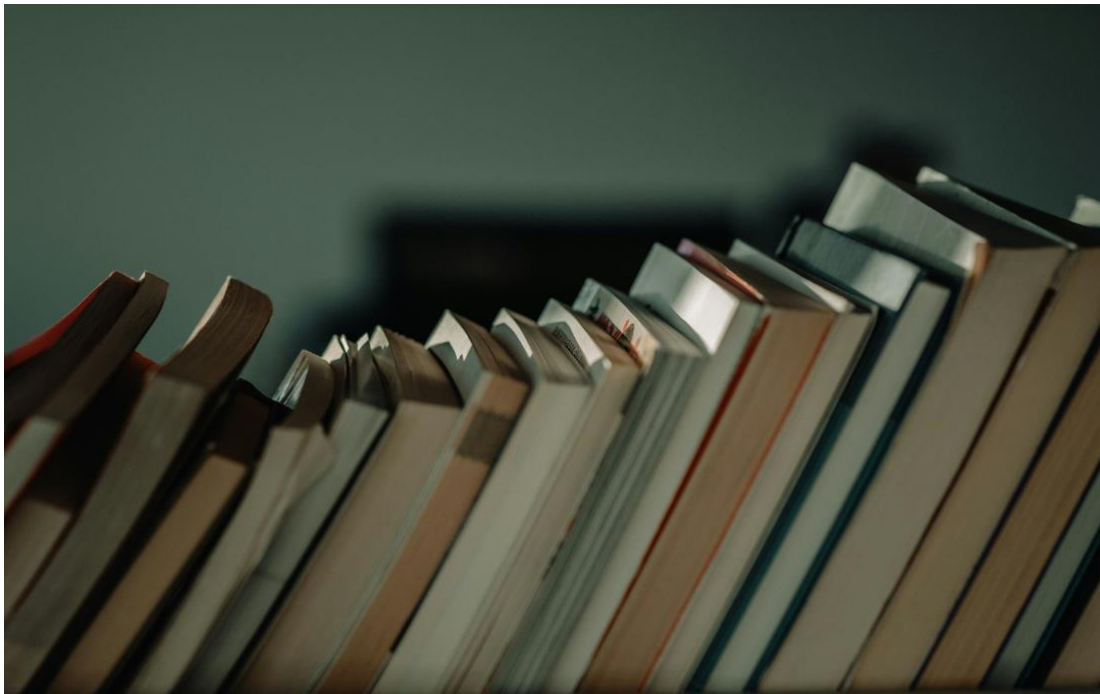


# THE 1ST EUROPE ASIA-PACIFIC UNDERGRADUATE RESEARCH SYMPOSIUM



*20 September 2024*

Organising Universities



## Welcome Message

Welcome, students, to the Europe Asia-Pacific Undergraduate Research Symposium (EAPURS). It is an honour to have you here as we gather to celebrate the remarkable achievements of your fellow undergraduate researchers from Kyushu University, Johannes Gutenberg University of Mainz, the University of Warwick and of course, the University of Canberra.

This conference is not just an event; it is a convergence of ideas, ambitions and cultures. The research presented here spans a wide range of disciplines, reflecting the intellectual capabilities and creative minds of the next generation of scholars joining us today.

As participants, you are not only sharing your findings, you are contributing to a global exchange of knowledge. This conference is a platform for collaboration, where new partnerships are forged, and where ideas are challenged and refined.

Our aim is to grow and cultivate the talent within our respective nations by offering undergraduate students a chance to showcase their work on a global platform. The Japan-Australia Research Leadership and Innovation (JARLAI) unit gave University of Canberra and Kyushu University students the opportunity to network and explore research concepts under the mentorship and guidance of a range of experts.

We encourage you all to engage fully in discussion, ask questions, and embrace the opportunity to learn from and alongside your peers. This is an incredibly valuable chance, offering a unique experience within the world of undergraduate research. Together, we can inspire change and drive progress in all fields of research.

This conference would not have been possible without the tireless efforts of Jesse Blakers, Dr. Ernest Koh, Dr. Ashraf Ghanem, and Dr. Francesca Frassinetti. Along with all the volunteers from both the University of Canberra and our partner Universities who worked tirelessly to organise and put together EAPURS.

Once again, welcome to the Europe Asia-Pacific Undergraduate Research Symposium.

Anneka Grant  
Kotaro Ikeda  
Elise Kapetanakos  
Mayu Mimura  
Jasper Shields  
Hüseyin Uysal

*2024 Student Leaders*



## How to attend the 2024 EAPURS

The 2024 EAPURS is a hybrid event that can be joined both in-person and on-line.

**For those at the University of Canberra Bruce Campus, please do come along to the room where we'll be holding the proceedings:**

Room 2A14 (Building 2, Level A, Room 14)

**Or Join via Zoom:**



**MEETING ID: 915 883 9685**

**<https://zoom.us/j/9158839685>**

*This event is supported by the CreatEquity Grants Scheme 2024 and the Japan Society for the Promotion of Science Alumni Association in Australia (JSPSAAA).*

## Conference Agenda

<b>Conference Opening</b>		
03:30-03:40 AM CEST	10:30-10:40 AM JST	11:30-11:40 AM AEST
<i>EAPURS 2024 Student Leaders:</i> Elise KAPETANAKOS (University of Canberra) Kotaro IKEDA (Kyushu University)		

<b>Session 1: Environment</b>				
03:40-04:40 AM CEST		10:40-11:40 AM JST		11:40 AM-12:40 PM AEST
Chair	Kotaro IKEDA (Kyushu University)			
Title	Impacts of Sediment Discharge from Land on Coral Reefs in Ishigaki Island: Importance of the Transition Zone between Land and Sea	Environmental Conservation and Social Influence in Japan-Australia through the Adoption of Nuclear Energy	Effect of Fibrinogen on Complement System in Carp	Natural Environment Protection and Disaster Prevention
Presenter	Dhiva ALTHAF PRATAMA	Ruby THOMAS; Stephanie MATTHEWS; Jasmine JARRETT-GLASS; Nimhara WELIGODAPOLA; Tasuke OYA; Kaede ARIMA	Ko LAI	Shino TAKEYAMA
Institution	Kyushu University	University of Canberra & Kyushu University	Kyushu University	Kyushu University

<b>Coffee/Lunch Break</b>		
04:45-05:15 AM CEST	11:45 AM-12:15 PM JST	12:45-13:15 PM AEST

<b>Session 2: Across Cultures</b>				
05:20-06:20 AM CEST		12:20-13:20 PM JST		13:20-14:20 PM AEST
Chair	Jasper SHIELDS (University of Canberra)			
Title	Identifying shared interests between the circular economies of Australia and Japan	Continuous intercultural communication to break down barriers between foreigners and Japanese	Comparative analysis of opioid control legislation between Australia and US	Exploring Institutional Gender Equality: A Demographic Analysis of Sexism in Kyushu University, Japan, and Stockholm University, Sweden
Presenter	Stephen QUILKEY; Ciel GEORGIEVSKI; Christopher LAFFERTY; Takahiro KUROKI; Shino TAKEYAMA	Kotaro IKEDA	Anneka GRANT	Kotomi IDESHI
Institution	University of Canberra	Kyushu University	University of Canberra	Kyushu University/Utrecht University

<b>Session 3: Stories and Narratives</b>				
06:25-07:25 AM CEST		13:25-14:25 PM JST		14:25-15:25 PM AEST
Chair	Mayu MIMURA (Kyushu University)			
Title	An Examination of the Diversification of Women's Career Choices in Rural Prefectures of Japan: A Case Study of Kagoshima Prefecture	How anonymity can improve student social interactions through a pen pal platform	The creation of additional value through storytelling in the second-hand clothing market in Daimyo	The Deconstruction of Native American Stereotypes in the Disney+ Series 'Reservation Dogs'
Presenter	Erii TOMINAGA	William GUNN and Ali CHOPRA	Takahiro KUROKI	Adam Josef WILL
Institution	Kyushu University	University of Canberra	Kyushu University	Johannes Gutenberg University Mainz

<b>Session 4: Human Development</b>				
07:30-08:30 AM CEST		14:30-15:30 PM JST		15:30-16:30 PM AEST
Chair	Elise KAPETANAKOS (University of Canberra)			
Title	Research on labor facing relative poverty in Japan	Once poor, always poor? An analysis of obstacles to overcome material deprivation in Germany's conservative welfare state	Adolescence of "Ikigai"	Promoting academic studies for young people from rural and island areas
Presenter	Mafuyu USHIBANA	Sebastian AUER	Junya MATSUMOTO	Takeru URAKI
Institution	Kyushu University	Johannes Gutenberg University Mainz	Kyushu University	Kyushu University

<b>Publishing as an Undergraduate</b>		
08:35-09:15 AM CEST	15:35-16:15 PM JST	16:35-17:15 PM AEST
Editors of <i>Reinvention: An International Journal of Undergraduate Research</i> (University of Warwick)		

<b>Session 5: Technologies and their Applications</b>				
09:20-10:20 AM CEST		16:20-17:20 PM JST		17:20-18:20 PM AEST
Chair	Hüseyin Uysal (Johannes Gutenberg University Mainz)			
Title	Estimating the Occurrence and Richness of Mammalian Species in Japan using Remotely Sensed Measures of Vegetation Productivity	Next-Generation Robotics: Applying Transfer Learning to Machine Learning Robots by Leveraging Procedurally Generated Content	Undoing differences between Humans and their AI companions: Fantasies of (Dis)Embodiment	Scaffolding for cell proliferation toward cultured meat
Presenter	Hiroto GOTO	Mitchell STARR	Kimberly SCHLÜTER	Saika ITOU
Institution	Kyushu University	University of Canberra	Johannes Gutenberg University Mainz	Kyushu University

<b>Coffee/Dinner Break</b>		
10:25 AM-10:55 AM CEST	17:25-17:55 PM JST	18:25-18:55 PM AEST

<b>Session 6: Pain and Gain</b>				
11:00 AM-12:00 PM CEST		18:00-19:00 PM JST		19:00-20:00 PM AEST
Chair	Anneka Grant (University of Canberra)			
Title	How can we develop students' non-cognitive abilities through school activities?	Insights into the Immunology of Complex Regional Pain Syndrome (CRPS)	Child development and family environment	Connecting people through moments of casual laughter
Presenter	Mayu MIMURA	Hüseyin Uysal	Rinka HASHIMOTO	Tomoyo MATSUKAWA
Institution	Kyushu University	Johannes Gutenberg University Mainz	Kyushu University	Kyushu University

<b>Session 7: Life</b>			
12:05-13:00 PM CEST		19:05-20:00 PM JST	20:05-21:00 PM AEST
Chair	TBA		
Title	Cross-cultural perspectives: An interdisciplinary study of women's sexual and reproductive health in Australia and Japan	Background and impact of the birth of anti-natalism	Molecular mechanisms of healthy aging and neurodegeneration
Presenter	Jasper SHIELDS and Elise KAPETANAKOS	Kaede ARIMA	Julia GOSCHKE
Institution	University of Canberra	Kyushu University	Johannes Gutenberg University Mainz

<b>Conference Closing</b>		
13:05-13:15 PM CEST	20:05-20:15 PM JST	21:05-21:15 PM AEST
<p><i>EAPURS 2024 Student Leaders:</i>                      Hüseyin UYSAL (Johannes Gutenberg University Mainz)                      Mayu MIMURA (Kyushu University)                      Jasper SHIELDS (University of Canberra)</p>		

# Abstracts

## ***Session 1: Environment***

**Dhiva ALTHAF PRATAMA**

### **Impacts of sediment discharge from land on coral reefs in Ishigaki Island: Importance of the transition zone between land and sea**

Coral reefs are essential for coastal protection and marine biodiversity as well as for broader economic benefits through tourism. However, coral reefs also face threats from local actions, such as harmful land use that could increase sedimentation from river runoffs. This study investigates surface sediments of various geomorphic units from the river to the coral reefs, by measuring the turbidity and quantify the weight ratio of sediment contents into organic matter, carbonate content, and terrigenous material. By using controlled Loss-on-Ignition (LOI) and X-ray diffraction, it has been able to show the distribution of sediment contents from different areas and various depths. The findings indicate that the existence of the tidal flat in Nagura Ampal may contribute to the decrease of terrigenous material flowing to Nagura Bay as shown by the terrigenous material content difference of the river and seagrass area ( $p < 0.047$ ; Dunn's post-hoc tests). Furthermore, a positive correlation between water depth with turbidity, organic matter, and fine terrigenous material content in Nagura Bay has also been observed. This research highlights the urgent need for the study of transitional zones that may play a role in protecting our coral reefs from heavy sedimentation and understand more about coral reefs growth in Nagura Bay.

**Ruby THOMAS; Stephanie MATTHEWS; Jasmine JARRETT-GLASS; Nimhara WELIGODAPOLA; Tasuke OYA; Kaede ARIMA**

### **Environmental Conservation and Social Influence in Japan-Australia through the Adoption of Nuclear Energy**

*\*Funded by the JARLAI program*

This research projects presents an interdisciplinary comparative study into the management of environmental conservation and sustainability in Japan and Australia with reference to individual and collective influence, through the lens of nuclear energy adoption. It analyses how communities and individuals are influenced and subsequently influence policy and laws affecting the use of nuclear energy. It highlights the underlying social and cultural factors that shape support for nuclear energy, which can assist in policy reform to reflect the needs of the people. The study investigates differing stances between Australia and Japan on nuclear power and the common need to improve environmental conservation and sustainability. The variety of social attitudes in both countries gathered through surveys and interviews will contribute to a research basis for possible transnational agreements and policy around nuclear energy to better reflect citizens' sentiments and expectations.

**Ko LAI**

### **Effect of Fibrinogen on Complement System in Carp**

The complement and coagulation systems are critical components of the innate immune response, with significant crosstalk reported in mammals. However, their relationship in fish remains unexplored. This study investigates the role of the coagulation protein fibrinogen in regulating the complement system in Common Carp (*Cyprinus carpio*). Adapting human purification methods, carp fibrinogen was successfully purified from small-scale carp plasma using affinity chromatography on protamine-toyopearl, followed by gel filtration. Hemolysis inhibition assays, which tested carp serum complement

lytic activity on erythrocytes, showed that native carp fibrinogen exhibits a weak inhibitory effect on carp complement activity, while human fibrinogen showed no inhibitory effect. The crosstalk between the coagulation and complement systems in humans mainly involves interactions post-fibrin formation, which may explain the lack of inhibitory activity observed in the human hemolytic inhibition assay results. Similarly, in fish, fibrinogen degradation products generated by thrombin or plasmin may be more effective complement inhibitors. A rapid method was developed to obtain carp fibrinogen, and the findings suggest that native carp fibrinogen is a weaker complement inhibitor compared to its degradation products. Future research will focus on generating and studying these degradation products to understand their regulatory roles in complement-coagulation interplay.

**Shino TAKEYAMA**

### **Natural environment protection and disaster prevention**

This research project focuses on the compatibility of natural environment protection and disaster prevention. Currently, sustainable disaster prevention and mitigation efforts are being made in Japan by utilizing ecosystems. One example is flood control using rice fields. In addition, concrete blocks for revetment walls that allow animals and plants to grow have been developed. However, these facilities have disadvantages such as lower durability and higher construction costs compared to those that do not consider the protection of the natural environment. In Japan, a country prone to disasters, it is important not only to protect the natural environment but also to create durable disaster prevention facilities. Although it is still in the planning stage, I would like to research with the goal of achieving both.

## **Session 2: Across Cultures**

**Stephen QUILKEY; Ciel GEORGIEVSKI; Christopher LAFFERTY; Takahiro KUROKI; Shino TAKEYAMA**

### **Identifying shared interests between the circular economies of Australia and Japan**

*\*Funded by the JARLAI program*

This research project seeks to identify and leverage shared interests between the circular economies of Australia and Japan, with the goal of facilitating a transition from linear economic models to sustainable circular systems in both countries. By fostering collaboration, knowledge exchange, and innovation, the project aims to explore complementary strategies that can address the unique challenges of resource management in Australia and Japan. Australia, a resource-dependent economy, and Japan, a resource-constrained industrialised nation, both face environmental and economic pressures that make the transition to a circular economy crucial. The impact of this research will extend beyond academia, providing valuable insights and strategies for policymakers, industry stakeholders, and international organizations, ultimately supporting circular economy initiatives in both countries.

**Kotaro IKEDA**

### **Continuous intercultural communication to break down barriers between foreigners and Japanese**

In Japanese society, there are emotional barriers between foreigners and Japanese. This barrier causes many issues like difficulties for technical interns. At Kyushu University, international students face the obstacle of making friends with Japanese students owing to this barrier. This happens to Japanese students too. In order to break the wall and encourage people to communicate with each other, I suggest continuous intercultural communication. If we prepare opportunities to make people communicate, they will get into each other's backgrounds and understand tacit knowledge. As a result, Japanese society will realize more active relationships between Japanese and foreigners. In Kyu-dai, Japanese students and international students will get closer. Therefore, students can have a more effective and enriching educational experience, and conduct a lively discussion in many projects. Right now, I am planning to develop two programs to break the barrier. First is an eight-week program of understanding each other's culture by talking frankly with each other and taking part in social activities, like having BBQ or sports. Second is a half-year program of making one act. The purpose is to encourage communication by making same act and practice on same time.

**Anneka GRANT**

### **Comparative analysis of opioid control legislation between Australia and US**

This research project, a comparative analysis of opioid legislation between Australia and the United States, was designed to analyse comparative differences between their respective control measures. The research methodology adopted was variation-finding comparative analysis, this methodology drew out similarities and differences in approach in two specific areas of prescription opioid control measures: prescription amounts and prescription tracking. A total of four (4) pieces of legislation and regulations were considered (two for prescription amounts and two for tracking) from Australia and the United States respectively. The analysis showed that the approaches between the two countries overlapped in the nature and goal of the regulations, but the particulars of the legislation varied. Differences and similarities were best understood when evaluated through the specific theoretical frameworks of understanding the greater social commentaries and narratives surrounding the opioid crisis.

**Kotomi IDESHI**

**Exploring Institutional Gender Equality: A Demographic Analysis of Sexism in Kyushu**

This research (N=1,168) examines whether gender equality within academic institutions serves to diminish its prevalence. Focusing on Kyushu University in Japan and Stockholm University in Sweden, the research explores the correlation between gender equality, demographic variables, and sexism. Using the Ambivalent Sexism Scale, Modern Sexism Scale, and Neosexism Scale, the study assesses sexism among groups of students and researchers, considering factors such as gender, age, educational background, and exposure to gender studies courses. The findings indicate that contexts where gender equality is more pronounced, with nearly equal numbers of men and women, are associated with lower levels of overt forms of sexism (hostile and neosexism), particularly among women. However, implicit forms of sexism, such as benevolent and modern sexism, remain prevalent, highlighting gender biases in diverse environments. The study also reveals that men exhibit consistently higher levels of sexism across all forms examined. While exposure to gender studies and younger age groups can reduce hostile sexism, they are less effective against implicit forms of sexism, suggesting that age alone is not a significant determinant of sexist attitudes in university settings. While gender equality reduces overt forms of sexism, they do not fully address implicit forms of sexism, and sexist attitudes are more influenced by gender than by exposure to gender studies and age.

### ***Session 3: Stories and Narratives***

**Erii TOMINAGA**

#### **An Examination of the Diversification of Women's Career Choices in Rural Prefectures of Japan: A Case Study of Kagoshima Prefecture**

Japan's university bachelor's program enrolment rate stands at approximately 51%, aligning closely with the OECD average. In more detail, however, the rate of women entering university in rural areas is shallow. In terms of fields of study, women tend to choose female-oriented studies or to enter specialized training colleges. The present study sets Kagoshima Prefecture as a targeted area. To account for regional disparities in education between local public preparatory schools and private preparatory schools in urban areas, Kariya (2007) points to academic achievement levels and the ability to cover school fees. However, the university enrolment rate of women in Kagoshima Prefecture has overall been stagnant since the 1970s, even when compared to Kumamoto and Miyazaki Prefectures, which have similar academic achievement levels and household incomes in the same Kyushu area. In terms of labor market aspects, the employment rate for girls has been on the rise since the late 1980s, but the gender wage gap in Japan is still serious by international standards. Previous studies point out that occupations with a higher proportion of women tend to require more care skills, and that there is a gender occupational segregation issue such that occupations with a higher proportion of women earn lower wages. The present study relies on the theoretical framework of Beckham's human capital theory and Hakim's preference theory. Based on these, the research questions are addressed through qualitative and quantitative research.

**William GUNN and Ali CHOPRA**

#### **How anonymity can improve student social interactions through a pen pal platform**

University Penpals is a platform designed for university students to connect anonymously and form meaningful one-on-one relationships. Our mission is to foster meaningful connections, support isolated students, and provide a low-risk, low-commitment environment for making new friends easily. We cater to university students seeking to overcome mental health challenges and meet peers they might not encounter otherwise. Our platform is dedicated to creating a space where students can share their passions and interests while maintaining their anonymity, allowing them to build connections at their own pace. We recognise that students deeply immersed in their studies often find it difficult to socialise, and campuses can sometimes feel isolating. Therefore, our primary goal is to facilitate new friendships and bring people together through our website and app, without the pressure of high-commitment interactions. By offering this supportive environment, we aim to help students navigate the challenges of university life and improve their overall well-being.

**Takahiro KUROKI**

#### **The creation of additional value through storytelling in the second-hand clothing market in Daimyo**

The role of changing trends in the apparel industry has created many issues. These days, the cycle of the trend system is too fast to sustain. In "After a fashion", Joanne Finkelstein introduced Thorstein Bunde Veblen's "trickle-down theory" to explain the system of trend. According to the theory, the phenomenon of trends emerged from the bourgeoisie attempting to differentiate themselves from lower classes. After the bourgeoisie produces something, which cannot be imitated easily, the lower classes manage to copy it to fulfil their admiration of the bourgeoisie. Today, the trend isn't born by only bourgeoisie. For example, many street cultures became big trends and the process cannot be explained by "trickle-down theory", as it is almost in a sense "trickle-up". The most important point of the system

of trends is making differences between one group and other groups and diffusing it to the other groups. Normally, much time is needed for the information about a trend to spread to other groups. However, diffusion through the internet allows trends to be found and consumed easily. To catch up on trends easily, fast fashion companies emerged, which responds to trends rapidly and produces significant quantities cheap clothing by using their global supply chain. The cheapness allows consumers to throw away the clothing easily when the trend goes out of fashion, and the structure of global supply chains servicing fast fashion have resulted serious health, low-salary and low-level of working circumstance issues in developing countries. In my view, these issues can be solved by second-hand clothing. In the second-hand clothing industry, the clothing doesn't lose value even though the trend goes out of fashion, because heritage is the most important value in the second-hand clothing industry. The second-hand clothing industry is isolated, so I am going to research about the industry, especially about the way of making additional value, by participant observation as an effort of cultural anthropology.

**Adam Josef WILL**

### **The Deconstruction of Native American Stereotypes in the Disney+ Series 'Reservation Dogs'**

Native American representation in motion picture productions has been mostly reductive and although some changes have occurred over time, Native American stereotypes still abound in the 21st century. However, Native Americans have started talking back to these negative Hollywood's portrayals with films like *Smoke Signals*, "written by and starring Native talent" (Moya-Smith) or with video productions from the all-Native comedy group *1491s*. Given that from 2021 to 2023 members of the *1491s*, who are known for countering Native American stereotypes, started producing the virtually all-Native comedy show *Reservation Dogs* that portrays Native Americans in a "way never before seen in TV or film," (Nelson) I argued that *Reservation Dogs* presents a groundbreaking counter-representation of Native Americans told by Native people that actively contributes to the deconstruction of Native American stereotypes. This study aimed at identifying strategies that were used in *Reservation Dogs* to offer a counter-representation of Native Americans and to deconstruct existing stereotypes all while exploring how this allows the audience to learn more about Native culture. Before analyzing the representation of Native Americans in the series, the portrayal of Native Americans throughout history as well as stereotypical representations of Native Americans in motion picture productions were explored and stereotypes were defined and examined regarding their function, emergence and impact on humans in general and on Native Americans in particular. The subsequent analysis of five different groups of stereotypes has revealed that *Reservation Dogs* successfully deconstructs various stereotypical beliefs through an array of strategies.

## ***Session 4: Human Development***

**Mafuyu USHIBANA**

### **Research on labor facing relative poverty in Japan**

My research focuses on the structure of Japanese economics to reveal how and why some people face relative poverty and what the key differences are between those who have financial difficulties and those who do not. Recently, global economic balance has not been stable because of many factors such as developing technologies, intense competition for commodities, international or domestic conflict, rising prices, etc. Especially, the Japanese Yen has been quite cheaper than the value of almost all countries for the last few years. Following this, domestic economics in Japan is unstable and the price of things keeps inflating while salaries remain static. According to the Ministry of Health, Labour and Welfare, average wages remained at the same level for about 25 years. However, it does not mean all industry sectors lose the momentum of economic power because while some industries decrease wages, other sectors experience a booming economy. It means the gap is broadening between lower-income and higher-income households. I would like to clarify which sector is on the upper side of the wage pyramid, which sector is on the lower side, and what to do to raise the wage of lower-income labor.

**Sebastian AUER**

### **Once poor, always poor? An analysis of obstacles to overcome material deprivation in Germany's conservative welfare state**

The welfare state is supposed to support people in times of material deprivation and show them ways out of need. However, it is often the case that people who need support from the welfare state are unable to overcome their needy status even after a long period of time, sometimes even across generations. The question therefore arises as to what obstacles prevent materially deprived people in the conservative welfare state in Germany from overcoming their neediness. To answer this question, a qualitative analysis was conducted using guided interviews with people at food banks to find out more about the background. The interviews were then evaluated and categorized. Four categories of subjectively perceived hurdles were identified: Individual hurdles (age, illness, insufficient language skills, lack of education), systemic hurdles (bureaucracy, lack of enlightenment, lack of further training, psychological pressure), social hurdles (discrimination and racism, social exclusion) and family hurdles (transfer payments to own family). It is noticeable that a large proportion of the people in the interviews want to work, but are prevented from doing so due to various problems. This means that there is no need for an “activating” welfare state to motivate people to work. Instead, what is needed is an “enabling” welfare state that offers people individual solutions to individual problems.

**Junya MATSUMOTO**

### **Adolescence of “Ikigai”**

My research theme is ikigai in Adolescence. Ikigai is translated into English as purpose of life. I chose this theme because I believe that “purpose in life” is an important concept in the world in the future, as the world is becoming materially affluent, but at the same time it is in danger of losing sight of the true way of life of human beings. What I am conscious of is to combine multiple fields of study without being particular about one field of study. I am examining adolescence with Erikson from the field of pedagogy and psychiatrists Mieko Kamiya and Frankl from the field of philosophy as my main focus.

**Takeru URAKI**

**Promoting academic studies for young people from rural and island areas**

My research aims to make career planning in rural and island area more realistic and concrete through using studies and academics. Hachijojima, an island in Tokyo, where I am from, does not have a university, and to attend one, you must take a plane. Last year, I taught classes on 'Should one go to university?' and 'How to study subjects like Japanese, math, English, science, and social studies if you do go to university' for the island. This year, to make it more sustainable, I plan to write and send a newspaper. Additionally, with the cooperation of professors, I will include interviews and video letters explaining how local nature is viewed by experts to foster interest in academics. I will send these materials and research the responses.

## ***Session 5: Technologies and their Applications***

**Hiroto GOTO**

### **Estimating the Occurrence and Richness of Mammalian Species in Japan using Remotely Sensed Measures of Vegetation Productivity**

The Dynamic Habitat Indices (DHIs) provide three satellite-derived measures of annual vegetation patterns: cumulative DHI, minimum DHI, and variation DHI. The relationships between the DHIs and species richness are well grounded in ecological theory and have been used to predict biodiversity patterns around the globe. However, they have not been tested within Japan, particularly its mammalian diversity. This study aimed to a) evaluate the relationships of the DHIs with patterns of species richness and occurrence of mammals in Japan, and b) assess the predictive power of the DHIs. Ten mammal species were investigated, and DHI values were derived from MODIS FPAR. Associations were evaluated through statistical tests and regression models were used to assess performance. The associations of the three DHIs with species richness were consistent with ecological theory but showed low predictive power. Occurrence patterns showed varying associations with the DHIs among different species, with predictive power ranging from low to moderate. Variation DHI was the most effective predictor and combining the three DHIs did not improve performance. Although with limited predictive accuracy, the DHIs help elucidate the factors shaping mammal diversity patterns in Japan, and offer insights into species-habitat associations within the unique environmental landscape of Japan.

**Mitchell STARR**

### **Next-Generation Robotics: Applying Transfer Learning to Machine Learning Robots by Leveraging Procedurally Generated Content**

Machine learning (ML) models share similar underlying principles, although each requires different forms of training data depending on their specific applications. Unlike chat-based models, which can acquire high-quality open source data, ML robot models utilise complex digital 3D environments for effective training, requiring significant financial investment for adequate datasets. Without complex datasets, generalisation is compromised, widening the model's Sim2Real (simulation-to-reality) gap, and decreasing overall \ quality. Aiming to enhance ML-based robots by reducing the Sim2Real gap, I have developed a methodology that integrates video game technology with artificial intelligence and robotics. Video games, such as Minecraft and No Man's Sky, use procedurally generated content for unique, yet replicable terrain, worlds, and levels. Epic Games' Unreal Engine 5 (UE5) furthers this concept, with its Procedural Content Generation (PCG) framework, achieving countless parameter-based photo-realistic environments. Introducing transfer learning as a training method will theoretically enhance robot quality with better generalisation capabilities, although transfer learning requires a significant increase in dataset size. The crux of my approach lies in using domain adaptation and randomisation, empowered by UE5's PCG framework, as it fulfils their dependence on large datasets. This integration of technologies from various industries will contribute to robotic advancements and increase the potential for deployment of reliable, adaptable robotic systems.

**Kimberly SCHLÜTER**

**Undoing differences between Humans and their AI companions: Fantasies of (Dis)Embodiment**

How do users of virtual AI companions seek to reduce or overcome imagined differences between themselves and their digital counterparts? And what fantasies about human-machine and body-technology relations emerge in this context? This research offers social science perspectives on attributions to and relationships with communicative artificial intelligence. It explores how users (re)negotiate their relationships with anthropomorphic machines amid advancements in artificial intelligence development. By analyzing forum posts from AI companion users, the study uncovers fantasies of (dis)embodiment, highlighting a dual desire: users envision their AI counterparts inhabiting various physical forms, while simultaneously fantasizing about their own disembodiment and possible digital existence in the future. On closer inspection, it becomes clear that these fantasies are by no means new, but are rooted in early depictions of human-machine hybridization found in mythologies, visual arts, and science fiction. The findings aim to contribute to a deeper understanding of human-machine differentiation, attributions to and (intimate) relationships with social chatbots as artificial companions.

**Saika ITOU**

**Scaffolding for cell proliferation toward cultured meat**

Producing cultured meat requires steps such as cell selection and preparation, development of edible culture media, mass culture of cells, and creation of three-dimensional products. A cell adhesion environment is important for cell culture. Cell scaffolds play an important role in controlling functions such as cell adhesion, proliferation, and culture, and in inducing tissue regeneration. There are two types of scaffolds: 2D culture and 3D culture. 2D culture primarily requires a scaffold for cells to adhere to. ECM (extracellular matrix) is a well-known scaffold for this purpose. Additionally, hydrophilicity and hydrophobicity are also listed as necessary elements. In the future, I plan to conduct experiments to analyze the relationship between scaffolding and the proliferation of cells that are the target of cultured meat.

## ***Session 6: Pain and Gain***

**Mayu MIMURA**

### **How can we develop students' non-cognitive abilities through school activities?**

The research focuses on how to develop students' non-cognitive abilities through school activities. Non-cognitive abilities are essential skills in today's society. According to a survey conducted in one class – a very small questionnaire with my classmates, conducted as a class project – there are a certain number of people who experience difficulties in planning or continuing their work tenaciously when they are required to carry out class assignments. In addition to this, Japanese education does not offer sufficient support for children to acquire this kind of skill. Therefore, it is necessary to develop non-cognitive abilities in school education. In my research project, I plan to study how today's school activities are useful for the non-cognitive skills' development and consider what kind of activities are essential for improving students' non-cognitive abilities. Through this survey, I try to find what kind of activities are important to develop the skill and consider how to introduce or conduct them in schools more effectively.

**Hüseyin UYSAL**

### **Insights into the Immunology of Complex Regional Pain Syndrome (CRPS)**

Complex Regional Pain Syndrome (CRPS) is a chronic pain disorder that occurs post-trauma in an extremity. It is a debilitating condition characterized by chronic pain, oedema, and sensory disturbances. Despite its impact on patients' well-being and functioning, the pathophysiology of CRPS remains incompletely understood. Recent research has highlighted autoimmune aspects, but without a thorough understanding of the underlying mechanisms, effective therapies cannot be developed. Liu et al. (2021) emphasize the need for better understanding: "Despite the awareness of CRPS among medical practitioners for over a century, its pathogenesis remains unclear, and the available treatment is still unsatisfactory". My MD-project will revolve around a specific population of immune cells called "T- lymphocytes". I am aware that not everyone is interested in the minute molecular details of such a specific matter. Thus, I will try my best to provide an interesting and fun presentation for students of all subjects. In my presentation I will focus on the history of the disease, give a short summary of what we know so far about the pathophysiology of CRPS and provide an overview of the methods that are planned.

**Rinka HASHIMOTO**

### **Child development and family environment**

A child's mental, physical, and language development is greatly influenced by the words and actions of his or her parents. As they say, children are a mirror of their parents, and the family environment in which they are born and raised is often mirrored in their children. I have truly come to realize this from my experience of working with school-age children for over two years. It has become clear to me that there is a clear correlation between the characteristics of a child's home environment and his or her personality. In this study, I will present research on the family environment that governs the formation of children's personalities, such as which words and actions of parents affect children, what kind of language is effective, and how it affects the children's later life, based on a case study in Japan in particular. This research will continue for another year or more and is still in the pre-research stage, but I would like to discuss the results at this point.

**Tomoyo MATSUKAWA**

**Connecting people through moments of casual laughter**

The aim of my research is to connect people so that they can understand each other's backgrounds instead of the sadness that occurs when they cross paths. Every day, people around the world experience differences, ranging from those close to them, such as between people at work and between friends, to those on a global scale, such as between countries and races. Sad events such as injuries and deaths also occur as a result of these differences. Instead, I hope that we can understand each other's values, find points of agreement, and combine our good points to achieve growth and develop the world in a way that we could not do alone. To achieve this, I also believe that casual moments of laughter are important. I believe that laughing together makes it easier to receive the thoughts and different parts of the other person. Therefore, in my research, I would like to verify the effects of laughter using evaluation methods from other studies, using what I believe to be the actual effects, and to explore the differences. Also, if I can find an opportunity to create a moment of casual laughter by using this means and other research as a reference, I will create my own trigger in the form of a form.

## ***Session 7: Life***

**Jasper SHIELDS and Elise KAPETANAKOS**

### **Cross-cultural perspectives: An interdisciplinary study of women's sexual and reproductive health in Australia and Japan**

Current standards of treatment that women receive for sexual and reproductive health (SRH) matters in the Australian and Japanese medical is a point of serious concern. Women face a multitude of challenges when accessing health care services in both countries, which contributes to the declining birth rates across the two countries. Whilst studies have set out to further understand the reasonings and present possible solutions to this, none thus far have been able to approach the problem from both a bicultural and interdisciplinary perspective. We sought to further understand the cultural and practical challenges faced providing women with adequate SRH care in both countries by combining our resources with Kyushu University, reflecting on previous studies, literature and current policy and procedures. Our research found that many of these challenges faced by these two nations stem from gaps in education of both patients and healthcare providers. Many cultural and social factors can interfere with the ways in which women interact with the healthcare system. SRH infrastructure across both countries can benefit greatly from further public education and specific training to general practitioners regarding SRH.

**Kaede ARIMA**

### **Background and impact of the birth of anti-natalism**

Antinatalism is a philosophical and ethical position that questions or rejects the act of bringing new life into existence. It suggests that all beings with life have the potential for suffering and misery at birth. It also indicates that excessive population growth can lead to environmental degradation and resource depletion. Although the term "antinatalism" emerged in the 2000s, such thoughts and ideas have existed since ancient times. Taking humans as its focus, anti-natalism includes birth denial, which states that it would have been better if one had never been born, and birth denial, which states that it would have been better if humans had never been born. The instinct of many animals, including humans, is to procreate for the species' survival. This ideology is very interesting because it attempts to suppress that instinct with reason. I would like to research the background of the birth of this principal idea and how this idea relates to the future prosperity of humankind.

**Julia GOSCHKE**

### **Molecular mechanisms of healthy aging and neurodegeneration**

Why do people age differently? Why are some individuals cognitively much fitter in old age than others? These are questions to which we still seek answers which could help promote and achieve healthy aging in a targeting manner. One attempt to contribute to answering these questions is being pursued in genetics. Several research groups have discovered a genetic polymorphism seemingly associated with age-related cognitive decline and impairment. This polymorphism is a so-called single-nucleotide polymorphism (SNP) on the gene TACR3, which encodes for the receptor of the neuropeptide neurokinin 3 (NK3). The suspected SNP on this gene is rs2765. A SNP is a location in the DNA sequence where one of the bases (among the four adenine (A), thymine (T), cytosine (C), and guanine (G)) differs between individuals of a species. This means that some individuals for example have a G at a specific site in a gene, while others have a T at the same site. These single-nucleotide polymorphisms are among the reasons why individuals within a species differ phenotypically as well as genetically.

So far, the SNP rs2765 is suspected to influence the age-related decrease in the volume of the right hippocampus and the basal forebrain (BF) that appears in some individuals within age. These areas of the brain are responsible for memory formation and storage, as well as learning. A reduced volume in these areas consequently affects cognitive fitness. The aim now is to determine precisely how this genetic variance affects aging and how this knowledge can be used to prevent age-related cognitive decline in medicine. The further analysis of this has been taken up by the research group of Prof. Dr. Kristina Endres, which focuses on the molecular mechanisms of healthy aging and neurodegeneration. Among others, they also collaborate with the Leibniz Institute for Resilience Research. Following recent findings that SNP rs2765 influences the amount of synthesized NK3 receptors, current research is particularly focused on understanding how this influence occurs.