

List of Dissertation Abstract (Department of Artificial Environment)

Name	Supervisor	Title	Abstract
HU TINGYI	Yasumoto Masanori	Research on continuous utilization of User Innovation in Product Development —A Case Study on MIUI Community—	It is an important issue for companies to continuously utilize user innovation. In this study, the author took up the community "MIUI" of Xiaomi, a Chinese mobile Internet-related company, as a case. This study showed that the community can be expanded by giving management authority to users and promoting communication within the community. The author also clarified the possibility that the pyramid-shaped organizational structure can promote the continuous utilization of user innovation.
ZHAO YUCHEN	Narumi Daisuke	Study on demand response of the vending machine	In VPP conjugating for the supply and demand adjustment of the electricity by the high energy management technology that utilized IoT, I pay my attention to DR changing an electricity demand pattern. This study pays its attention to a drink vending machine installed in the whole country more than 2 million and is intended that I evaluate the possibility as the DR resource based on an experiment and simulation. In addition, I pushed forward examination for the purpose of the suggestion to develop for the group control that bundled up many vending machines which existed by construction in a predictive model in the city.

Amano Kyohei	Kumasaki mieko	Study of the Deterioration of Guanidine Nitrate Exposed to Ozone-Water Mixture Gas.	The deterioration of gas generators due to moisture absorption for a long term has caused a great number of accidents all over the world. In this study, we focused on guanidine nitrate as a reactive material used in airbags and investigated whether its thermal decomposition behavior influenced by accelerated deterioration tests that assume long term exposure to ozone. The results indicated that ozone - water mixture gas exposure increased the ammonium and nitrate ion content and the pressure increasing velocity.
Inoue Kazuki	Mieko Kumasaki	Reaction characteristics of energetic cocrystal containing oxidizer/reductant	Cocrystal is defined as crystal composed of two or more different molecules in crystalline structure. Cocrystallization connects reductant and oxidizer to synthesize energetic materials with high performance due to its short molecular intervals. In this study, novel energetic cocrystal composed of 1H-tetrazole and sodium perchlorate was prepared. This cocrystal showed higher sensitivity and deflagration performance than the mixture of ingredients.

Otsu Takanobu	Hondo Hiroki	CO <sub>2</sub> abatement costs of commercial solar water heating systems by region and business type	Japan commercial section aims to reduce greenhouse gas emissions by about 51% in fiscal year 2030 from its fiscal year 2013 levels. To reduce CO <sub>2</sub> emissions due to hot water demand, the use of solar water heating systems(SWHS) is expected. The purpose of this study is estimating CO <sub>2</sub> abatement costs of SWHS by region and business type and identifying introducing condition of cost-effective in CO <sub>2</sub> reduction. The estimation results reveal that the introduction condition that is cost-effective in CO <sub>2</sub> reduction. It is identified that the following conditions have high CO <sub>2</sub> reduction cost-effectiveness for SWHS installation; (a) when the region is warm and there is much sunlight quantity, and (b) when business type with a high demand for hot water supply and the demand centers daytime.
Kawata Nozomu	Ito Akihiko	Preparation of MgO–SiO <sub>2</sub> Films by Metal-organic Chemical Vapor Deposition	Materials in MgO–SiO <sub>2</sub> system exist in large quantities on earth, and MgSiO <sub>3</sub> garnet is expected to be applied to a novel cost-effective phosphor in white LED. In the present study, MgO–SiO <sub>2</sub> system films were prepared using metal–organic chemical vapor deposition and the effects of deposition conditions on the phase compositions, microstructures, and optical characteristics were investigated.

Kitagawa Yuta	Tadahiro Shibutani	A Proposal of Prediction Method of Origin Direction and Crack Growth Rate on Fatigue Fracture Surface Using Computer Vision Technology	Fracture surface analysis is an indispensable technique for damage investigation and determining the cause of fracture. However, conventional analysis methods are qualitative methods that depend on the subjectivity of the analyst for evaluation, and there are issues such as the need for skillful analysis and a decrease in the number of skilled workers. In this study, we propose a method to estimate the direction of the origin and the crack growth rate of the fracture surface of fatigue fracture using computer vision technology in order to shorten the time of fracture surface analysis, quantitatively evaluate the results, and support the analysts.
SATO Kota	NARUMI Daisuke	Impacts of Urban Heat Island on Ecosystem Services	<p>It is not difficult to imagine that the future continuation of rising temperatures in Japan's urban areas will affect our lives due to the synergistic effects of the heat island effect and global warming.</p> <p>In this paper, the relationship between heat island intensity and ecosystem services in Osaka Prefecture at present and in the future when heat island mitigation measures are implemented is clarified using production as an indicator of the amount of damage that will be caused by future temperature increases. This paper can be regarded as a pioneer in the development of scenarios for the introduction of heat island countermeasures that focus on the protection of ecosystem items.</p>

Terauchi Yuki	Shibutani Tadahiro	Advanced HALT Testing Using Data Analysis with Deep Learning	<p>In recent years, limit tests called HALT have been attracting attention in order to detect vulnerable parts of electronic equipment at the development stage and to prevent product failure at an early stage. In recent years, however, electronic devices have become more complex and smaller in size as their performance has improved, making it difficult to identify the location of the cause of failure. In this research, we aim to improve HALT by analyzing the test results using deep learning, a field of AI.</p>
Demmi Shun	Shiraishi Toshihiko	A Study of Noise Control of a Moving Evaluation Point by Using Neural Networks	<p>In this paper, we proposed a novel structure of neural networks and a method to bias the learning rates for noise control system in order to improve the control success rate and noise reduction performance when an evaluation point moves. The effectiveness of each method was investigated by numerical simulations. The results show that the proposed structure using the method to bias the learning rates has the control success rate of more than 90%, which is 30% better than a conventional structure and that the noise reduction performance is approximately 16 dB, which is approximately 4 dB better than a conventional structure.</p>

Tominaga Yusuke	Nakano Ken	Friction simulation of elastomer by foundation model with surface roughness	Flexible elastic materials such as elastomers exhibit high friction because they have a higher elastic modulus and a larger deformation volume than hard materials such as metals. There are two types of friction, adhesion friction and hysteresis friction, and hysteresis friction was the focus of attention in the development of the eco-tire. In this study, a foundation model with surface roughness was used for simulation. From the results obtained, the effect of surface roughness on the friction coefficient and penetration of hysteresis friction is reported.
Nomizu Daiki	Matsumiya Masahiko	Mutual separation of rare earth elements by batchwise multi-stage extraction using diamide based ligands	We studied the stepwise formation constants of water-soluble diglycolamide (DGA) and dioxaoctanediamide (DOODA) for the mutual separation of rare earth elements in a solvent extraction system. Metal complexes of two- and three-folding with water-soluble DOODA and DGA, respectively, were found, and each stepwise formation constants value was calculated using distribution ratios. Taking stepwise formation constants, their distribution ratio and separation factor, values into consideration, the suitable separation conditions were determined. In this study, La, Pr, and Nd were mainly present in the aqueous phase, whereas Sm–Dy existed in the organic phase.

Fujie Sayaka	Ito Akihiko	Preparation of SrHfO <sub>3</sub> films via chemical vapor deposition and evaluation of their luminescence properties	SrHfO <sub>3</sub> has excellent scintillation properties with high relative density and large effective atomic number; however, SrHfO <sub>3</sub> has not been understood well because SrHfO <sub>3</sub> is difficult to prepare due to its high melting point. In the present study, Ce <sup>3+</sup> -doped SrHfO <sub>3</sub> thick films were epitaxially grown on single crystalline substrates using laser-assisted chemical vapor deposition. Fluorescence lifetime and light yield for $\alpha$ -ray excitation were reported.
MASUDA JUNYA	NAKANO KEN	Relationship between the layer structure and macroscopic viscoelasticity of the concentrated polymer brushes	In order to improve the life of machine products, it is essential to reduce the friction on the surface of it. A concentrated polymer brush is an example of a material having low friction characteristics. A mechanical contact test was performed in which a metal ball was brought into contact with a substrate to which CPB was applied, and load, amplitude phase response and film thickness analysis were obtained. As a result, it was found that CPB generates an adhesive force and that the layer structure changes due to the adhesion. It was concluded that the waiting time does not affect the adhesion force, but the pushing load does.

maruyama ryuta	nakai satoshi	A Quantitative health impact assessment of long-term exposure to NO <sub>2</sub> in Yokohama city from 2000 to 2018	The need to conduct health impact assessments to support decision-making on air pollution control policies has been pointed out, and many studies have been conducted, mainly in Europe and the United States. However, the number of HIA in Japan is limited and sufficient knowledge has not been obtained. In order to accumulate knowledge that will contribute to air pollution countermeasures in Japan, this study aims to conduct an air pollution health impact assessment (HIA) and estimate the health effects at current pollution levels. Using AirQ+, a software tool developed by WHO/Europe for assessing the health effects of air pollution, we estimated the mortality effects of long-term exposure to NO <sub>2</sub> in Yokohama City.
Mitsubishi Yuri	Akihiko ITO	Preparation of Al <sub>2</sub> O <sub>3</sub> -Y <sub>2</sub> O <sub>3</sub> films using chemical vapor deposition and their luminescence properties	Al <sub>2</sub> O <sub>3</sub> -Y <sub>2</sub> O <sub>3</sub> system is widely used as optical materials such as phosphors and scintillators due to its excellent mechanical and optical properties. In recent years, non-destructive testing using X-ray has become important because of the increasing demand for electronic devices, and a direct preparation method of film scintillators for high-resolution imaging is required. In present study, Al <sub>2</sub> O <sub>3</sub> -Y <sub>2</sub> O <sub>3</sub> films were prepared by chemical vapor deposition, and the effects of deposition conditions on microstructure and fluorescence properties were investigated.



Wang Qishun	endo akira	An analysis of the impact of the E-sports industry on the local Economy in Shanghai -- Approach by Input-Output Analysis --	The organization of large-scale events has attracted more attention due to their economic and social impact for the region as a means of local revitalisation. Many cities are actively hosting e-sport events to revitalise their cities and strengthen their competitiveness, but the quantitative impact of e-sport events on the local economy is still unclear. This study focuses on the hosting of large-scale e-sport events and quantitatively analyses the economic impact on each industrial sector in Shanghai using an Input-Output analysis based on the 42-sector Input-Output table for Shanghai in 2012.
XU MINJIE	Shibutani Tadahiro	Research on factor analysis of high-pressure gas safety accident report based on machine learning	A large number of accidents occur every day around the world, and these accidents are recorded in natural language. However, these natural language accident data is difficult and time-consuming to analyze manually and identify the relationship between factors. In this research, I propose a machine learning-based natural language processing method to extract accident factors and analyze factor relationships. I tested traditional machine learning methods against Word2vec and bert, and checked the applicability of the models.

Shiyue Cheng	Shusa yoshikazu	Research on the competitive strategy of retail enterprises under the environment of new retail in China : Take Freshhema and Costco as examples	Under the influence of new retail, many traditional retailers are turning business models one after another.why can some of the new retail companies succeed? How do they build their own competitive advantage? With this problem, this paper clarifies the problem through the research of the case study, and through the hearing to the top management of the retail business such as the store manager.
PAN QINGRONG	YasumotoMasanori	Research on construction of competitive advantage of emerging enterprises in architectural innovation - A case study of DJI-	This paper clarifies the formation process of unique architectural knowledge in the case of Daegu's architectural innovation experience. It explores any new impact on the construction of corporate competitive advantage.
Yang Zhanyu	KOBAYASHI Takeshi	Proposal for improvement of surface soil gas investigation technology for high-concentration volatile organic chlorine compound contamination	Many high-concentration soil pollutions due to volatile organic compounds have become apparent. Small and medium-sized enterprises in operation are often uninvestigated, and simple and accurate pollution investigation technology is required. In this research, we propose an improved method that can prevent the mixing of surface air during soil gas sampling, which is a problem with the conventional soil gas survey method. This improved method can confirm that analysis can be performed with equal or higher accuracy than the conventional method and the measurement time can be shortened. did it. Furthermore, by analyzing the actual pollution site data and the model, we were able to study a method that can estimate the pollution level and the horizontal concentration distribution of pollution from the results of the surface soil gas survey.

LEI YUTING	Shusa Yoshikazu	A research on how the word of mouth on SNS affects the decision-making of the consumers in China	<p>Today, the online word of mouth has become one of the most important elements that can affect the consumers' thirst of buying. In this paper, I paid attention to the Chinese customers and try to research how the word of mouth on SNS affects the decision-making of the consumers in China.</p> <p>In this research, I designed a questionnaire based on the Likert scale and used it to gather the data I needed. With the help of the SPSS 26.0 and SPSSAU, I analyzed the data and verified the research model. According to the result, first of all, the quality of information and the number of information can affect the perceived risk. Secondly, the fame of the information origin and the number of information can affect the group mentality. Thirdly, the perceived risk and the group mentality can affect the thirst of buying. The perceived risk and the group mentality play a role of mediation in the process. Besides, there is a chain mediation effect because the perceived risk can affect the group mentality at the same time. Further more, the consumer's involvement plays a role of moderator between the perceived risk and the thirst of buying, and the group mentality and the thirst of buying. Finally, I corrected my research model and found that the number of information can affect the thirst of buying directly. From what has been mentioned above, I made it clear that how the word of mouth on SNS affects the decision-making of consumer.</p>
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LIU SHANSHAN	NARUMI DAISUKE	Study on the countermeasures against heat-island phenomena considering the regional characteristics of densely urban area	In recent years, the temperature rise in urban areas has been remarkable due to global warming and urban heat island. In addition, it is positioned that densely populated urban area is with an elevated risk of heat. Therefore, in this study, we focused on the heat characteristics of densely populated urban areas, targeted typical densely populated urban areas in Nishi-Ku, Yokohama, and grasped the effects of differences in density on energy consumption and thermal environment, as well as multiple measures against heat. We quantified and evaluated the effect of improving the indoor thermal environment and the block thermal environment by the introduction.
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