Program and Abstracts

4TH JOINT SYMPOSIUM OF KMUTT AND TUT

July 5, 2019

Tokyo University of Technology, Hachioji Campus

Hachioji, Tokyo, Japan

4TH JOINT SYMPOSIUM OF KMUTT AND TUT

Rebooting of Media Science

– redesigning research and educational agenda –

IT technology has been progressing rapidly and altered since our department was founded as proposing an interdisciplinary research area for dealing the complicated problems of modern world. Technological trends such like AI, VR, AR, Drone, Cloud and Wearable computing had brought novel approaches and changed a lot of research agendas ever since. In addition, a concept of SDGs is now considered as an important issue in many research fields. In such a situation, we felt a need to redefine the role and educational agenda in media science in a new perspective. We would like to gather and discuss what we would design our researches and educations.

We are delighted to be able to issue the proceeding of the 4th joint symposium held by the cooperation of Department of Industrial Education, King Mongkut's University of Technology Thonburi, and School of Media Science, Tokyo University of Technology.

Both schools started the collaboration in 2008 and concluded MOU in 2010. We held the joint symposium every few years since then, alternately at each campus. In those years, we exchanged students for internship programs, and the faculties visited each school, and thus, we have kept the relationship. This occasion, we can have another precious opportunity to run another joint symposium, and release this proceeding as the productive output.

This time, we welcomed eight faculties and four students from KMUTT, to TUT Hachioji campus. Faculties of both universities made presentations, and many students contributed to the poster session by presenting their research efforts. The oral presentations include not only the personal research themes but the keynote talks related to this symposium's central theme.

We want to express our sincere appreciation to all who attended and worked for the symposium. We wish to continue the relationship as strengthen it.

Attendees of the symposium.

ORGANIZATION

KMUTT

Tanes Tanitteerapan
Komkrit Chomsuwan
Nutthanun Moolsradoo
Suriyong Lertkulvanich
Chanin Tungpantong
Kanittha Bangpoophamorn
Waiyawat Saitum
Jiruth Patanachan

TUT

Masanori Kakimoto
Kunio Kondo
Takashi Ohta
Akinori Ito
Naoya Tsuruta
Yoshihisa Kanematsu
Kai Lenz
Masaki Abe

TIME TABLE, JULY 5TH, 2019

10:30～10:45	Opening Ceremony Opening Welcome Speech（Dean, Professor Kakimoto, TUT） Opening Speech (Dean, Dr. Tanes Tanitteerapan, KMUTT)
10:50～11:10	Presentation, “Introduction to Our Exchange Activities of KMUTT and TUT,” Professor Kunio Kondo, TUT
11:15～11:30	Coffee Break
11:30～12:00	Presentation, “Interactive Media for Chemical Bonding Model Learning with Augmented Reality (AR) Technique,” Chutharat Injaeng, Watchakarn Klamkamluck and Kanittha Bangpoophamorn, KMUTT
12:00～13:00	Lunch
12:45～13:00	MOU Sign Ceremony (15th floor)
13:00～13:30	Keynote Speech, “The Impact of Technology to Media Devices,” Professor Suriyong Lertkulvanich, KMUTT
13:30～14:00	Keynote Speech, “Teaching and Learning SDGs using Media Technology,” Associate Professor Mizuho Iinuma, TUT
14:00～14:30	Presentation, “The Study of Renewable Energy for Kinetic Sculpture,” Waiyawat Saitum. ,KMUTT
14:30～14:45	Coffee Break
14:45～16:00	Students’ Poster Session
16:00～16:15	break
16:15～16:45	Presentation, “Homophobia Test by Virtual Reality Game,” Natthasit Suksompong, Naphat Mechamnan and Jiruth Patanachan, KMUTT
16:45～17:15	Presentation, "Programming for Children,"Professor Takuya Terasawa,
17:20～17:30	Closing
19:00～	Dinner

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Kunio Kondo

Introduction to our Exchange Activities of KMUTT and TUT

Kunio KONDO

School of Media Science, Tokyo University of Technology

1. Overview of Our Exchange Activities

Tokyo University of Technology, School of Media Science have strong exchange activities with two departments of King Mongkut's University of Technology Thonburi (KMUTT) now. First is faculty of Industrial education and Technology at Bangmod from Nov. 2010, Second is the Project of Administrative Corporation in Media Arts and Media Technology Curriculum at Bangkhuntien from Feb. 2018. Our exchange with KMUTT started from 2008 to introduce about Graduate program of Media Science. After our visit, we had two students from KMUTT as a graduate student at April 2010. We held a signing ceremony for exchanges at TUT. Table 1 is shown Overview of Our Exchange Activities with KMUTT and TUT.

Fig.1 Meeting with President Karube, professors of KMUTT

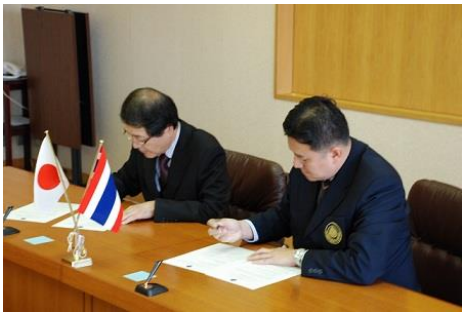


Fig.2 Signing Ceremony

Table 1. Overview of Our Exchange Activities with KMUTT and TUT

	Year/ Activities	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1	**Ceremony& Visiting**	11 Ceremony (MOU,TUT)			8 Visiting (Kojima)		8 Visiting (Kondo, Prof.Sripian)		9 Visiting (prof.Paiboon)	2 Ceremony (MOU,KMUTT) 6 Visiting (prof.Suriyong	3 Visiting 7 Ceremony (MOU,TUT)
2	**Students Exchange**	4 Master (TUT)	Master (TUT)	3 Master (TUT)						6 Internship (minnie),OB	6 Internship (Belle,Root)
3	**Professor Exchange**										3 Lectures (Ohta, Kakimoto)
4	**Symposium& workshop**			**3 1st Symp.** (KMUTT)	**3 2nd Symp.** (TUT)	10 IEVC2014 (Samui)		**6 3rd KTCIM** (KMUTT,Ohta ,Kishimoto, Tsuruta)	12 **CMIC** KMUTT,Media Arts & Media Technology)		7 **4th KTCIM** (TUT)
5	**Research /Exchange Program**									Exchange Program (KMUTT)	Exchange Program (KMUTT)
6	**Research Collaboretion**									11 ADADA (minnie&TUT)	

2. Our Exchange Activities

2.1 Exchange program

KMUTT and TUT have agreed to promote the following programs.

• Join support to the students' activities

• Exchange of faculties and researchers for the purpose of research and academic discussions

• Exchange of academic information including the research publications

• Joint symposium, seminar and other reciprocal visit of researchers

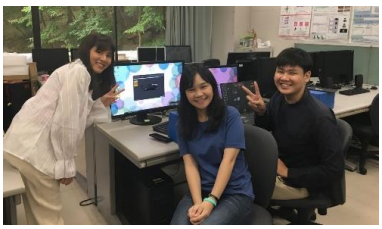
• Reciprocal visit of administrative personnel

• Other cooperative programs

2.2 Exchange Activities from 2010 to 2019

a.Support to the students' activities

TUT supervised internship students from KMUTT at 2018,2019. 2018:one student, 2019: two students.



b.Exchange of faculties and researchers

We have been KMUTT and TUT sometimes (see table 1). Prof.Ohta give lectures as a visiting professor at March 2019.

c.Research publications/ Journal papers

We published a poster paper of International conference on 2018ADADA with Internship student of KMUTT and professors of TUT.

d. Research Collaboration by Exchange Program

KMUTT propose excellent Internship & Activity Programs with scholarship.

3.For the future of our collaboration

a.Education: We have lectures and increase opportunities for educational and research exchanges with students and professors.

b. Research: There is an excellent exchange program by KMUTT. Students and professors can visit to KMUTT using this program. Professors of KMUTT &TUT must publish Journal papers based on research collaboration.

Signing Ceremony 2018. Feb.

Prof.Suriyong,Prof.Akinori Ito, Kondo 2018.June

Prof.Suriyong,Prof.Ohta,Prof.Mikami 2018.June

2019.7.5.KTCIM at TUT

Interactive Media for Chemical Bonding Model Learning with Augmented Reality (AR) Technique

Chutharat Injaeng
Watchakarn Klamkamluck
Kanittha Bangpoophamorn

Interactive Media for Chemical Bonding Model Learning with Augmented Reality (AR) Technique

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1. Significance and Background

Nowadays, textbook is the main media for learning along with the instructor who gives lecture in front of the class. For this reason, the learners are bored and have no motivation to participate in class and learning. There are modern technologies available to the learners to create motivation appropriately. One of the interesting technologies to support the teaching and learning is Augmented Reality or AR technology, the new introduced method, which creates 3D image to entertain the learners.

Augmented Reality or AR is the technology that brings 3D virtual image to the reality world via video camera, webcam, or camera on mobile phone. The processing will overlap the object as one image that can be seen through the camera directly [1]. This is one of the technologies that can be applied to many areas such as gaming, industry, business, particularly the education area that has more implementation of this technique.

Learning media creation is the plan to create or improve the media to become efficient. Media creation approach that is appropriate to the content makes it more interesting and simple for the learner to understand the content [2]. In Complement Science Curriculum, Chemistry topic of Atom, Periodic Table, and Chemical Bonding is the fundamental lesson leading to other lessons. In the past, there was only the photograph or slide to present the result of chemical model. Therefore, the researcher considered that AR technology was appropriate to use in the design to allow the learner to interact with the media, learn about electron circulation and chemical bonding of the compound. Chemical bonding comprised of Ionic bonding, Covalent

bonding, and metallic bonding [3]. Moreover, there was the lecture about chemical bonding that was inclusive, concise, and simple to understand to make it more interesting and activate the learner's learning for the better achievement.

2. Research Objectives

The objectives of the research were:

1. To develop the interactive media for chemical bonding model learning with AR technique.

2. To evaluate the quality of the interactive media for chemical bonding model learning with AR technique.

3. To evaluate the satisfaction toward the interactive media for chemical bonding model learning with AR technique.

3. Research Methodology

3.1 Population

Population was the seven students in Mathayomsuksa 4 who studied Science-Chemistry curriculum at Darunsikkhalai School selected with purposive sampling. [4]

3.2 Research Tools

The following tools were used in this research.

1. The interactive media for chemical bonding model learning with AR technique.

2. The quality evaluation form about the interactive media for chemical bonding model learning with AR technique for the experts: six experts in content and media.

3. The satisfaction evaluation form toward the interactive media for chemical bonding model learning with AR technique for the seven populations.

3.3 Data Collection

The researcher collected data as the following steps.

1. Data collection for quality evaluation by the experts

For collecting data to evaluate the quality of the interactive media for chemical bonding model learning with AR technique, the researcher contacted six content and media experts to evaluate the quality of the work and the evaluation form. Then, data

was collected to analyze the quality of the interactive media for chemical bonding model learning with AR technique.

2. Data collection for population satisfaction evaluation.

The researcher coordinated with the Director of Darunsikkhalai School and explained the objectives and how to use the media to the populations. Then, the students started using the interactive media for chemical bonding model learning with AR technique. In the end, the students were asked to complete the satisfaction evaluation form for the further analysis.

3.4 Data Analysis

The researchers utilized mean and standard deviation to analyze the quality evaluation by the experts and the satisfaction evaluation of the population toward the interactive media for chemical bonding model learning with AR technique.

4. Research Results

4.1 Analysis result of quality evaluation of the interactive media for chemical bonding model learning with AR technique by the experts

After developing the interactive media for chemical bonding model learning with AR technique, the experts evaluated the media by using the 5-Likert scale. The results were as follows. [5]

Table 1 Mean, Standard deviation, and Content Quality

Lists	Mean	Standard Deviation	Quality Level
1. The content is appropriate to the user.	4.67	0.58	Very Good
2. The sample in the presentation conveys the content accurately.	4.33	0.58	Good
3. Motion imitates the use of electron of bonding within the molecule appropriately.	4.33	0.58	Good
4. Motion can imitate the use of electron of bonding within the molecule to promote learning very well.	4.00	1.00	Good
5. The lecture communicates the content accurately and concisely.	4.33	0.58	Good
6. AR technology activates the curiosity.	4.33	1.15	Good
7. Overall content and pattern are appropriate and consistent.	4.33	0.58	Good
Total Mean	**4.33**	**0.72**	**Good**

From Table 1, analysis result showed that the quality of content was in good level. The mean was 4.33 and standard deviation was 0.72.

Table 2 Mean, Standard deviation, and Media Quality

Lists	Mean	Standard Deviation	Quality Level
1. Card design for each substance	4.67	0.58	Very Good
2. Application result on the mobile screen	4.00	0.00	Good
3. The use of sound with result display	4.33	0.58	Good
4. The simulation motion showing chemical bonding result	4.33	0.58	Good
5. Learning chemical bonding origin	4.67	0.58	Very Good
6. Presentation of substance information	4.67	0.58	Very Good
7. Sample of substance utilization	5.00	0.00	Very Good
8. AR technique is appropriate for the use	4.67	0.58	Very Good
9. Simple and convenient to use	4.67	0.58	Very Good
10. Appropriateness of media to the target group	4.67	0.58	Very Good
Total Mean	**4.57**	**0.46**	**Very Good**

From Table 2, analysis result showed that the quality of media was in the very good level. The mean was 4.57 and the standard deviation was 0.46.

4.2 Analysis result of the satisfaction of the population toward the interactive media for chemical bonding model learning with AR technique

The evaluation result of population satisfaction using 4 Likert scale [6] was as follows.

Table 3 Mean, Standard deviation, and Population Satisfaction

Lists	Mean	Standard Deviation	Satisfaction Level
1. Learning media is interesting and attractive.	3.86	0.38	Highest
2. Quantity of content is suitable.	3.71	0.49	Highest
3. Size of card and font format of substance information is appropriate and easy to read.	3.29	0.76	High
4. Cards and video are clear and easy to understand.	3.43	0.53	High
5. The sound is clear.	3.86	0.38	Highest
6. Video simulates the use of shared pair electron is clear, understanding, and has the suitable speed.	3.71	0.49	Highest
7. Learning is fun and pleasing	3.86	0.38	Highest
Total Mean	**3.67**	**0.21**	**Highest**

From Table 3, the results showed that the satisfaction of the sample group was in the highest level. The mean was 3.67 and the standard deviation was 0.21.

5. Discussion

After analyzing the data and developing the interactive media for chemical bonding model learning with AR technique, the experts evaluated the content and the media. The results were as follows.

1. The analysis result found that the quality of content was in good level. The content of the interactive media for chemical bonding model learning with AR technique is appropriate to the user. The content is clear, concise, and simple to understand. Overall content and pattern are appropriate and consistent. Interactive media, such as 3D virtual image and sound help the learner to understand the content and make it more interesting.

2. The analysis result found that the quality of media was in the very good level. AR technique was appropriate to use in the design to allow the learner to interact with the media. This can help the learners to understand the content and makes it more simple

For analysis result of the satisfaction, the results found that the satisfaction of the sample group was in the highest level which are the same as a hypothesis. The content is appropriate. Cards and images showing chemical bonding are clear and easy to understand. The media is attractive and interesting; therefore, it makes learning fun and not boring

The result of quality evaluation by experts and sample group are the same as a hypothesis. The researchers have studied the information to help in the development of interactive media for chemical bonding model learning with AR technique. Therefore, the preparation of media can encourage learners to learn more and activate the learners' learning for the better achievement. It can be a guideline for developing the interactive media for learning with AR technique for those who are interested in continuing to study in the future.

6. References

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The Impact of Technology to Media Devices

Suriyong Lertkulvanich

Teaching and Learning SDGs using Media Technology

Mizuho Iinuma

Teaching and Learning SDGs using Media Technology

Mizuho Iinuma, Ed.D, Tokyo University of Technology,

In year 2015, the United Nation has adopted the agenda for Sustainable Development Goals 2030. The SDGs consist of 17 goals including ending poverty, and climate change. Also, sustainable society considers not only the happiness of current generation but also that of the future generation which is reflected in the agenda. In order to achieve the SDGs, collaboration among government, educational institutions, local governments, NGO/NPO, civil society, and individual is crucial. Also a paradigm shift is needed to solve today`s complex sets of global and local issues. Education can play a key role in contributing to making such a shift happen. A new redefined educational institution is in need today. Educators as well need to think of how to effectively develop and implement a new type of teaching and learning that matches today`s global and local needs. Social design is an emerging approach which aims to solve social issues using design and design thinking. This keynote speech will discuss current trend of social design in Japan, explain its definition and share an example of a curriculum developed for sustainable development at Tokyo University of Technology.

The term social design conventionally has been used in field of design. For example Design 21 UNESCO defined social design as “Better design for the greater good.” Historically, social design was a term used in design field to describe an object of situation not only for profit but also for solving social and environmental issues, or to create new values and innovation for social change (Murata, 2013, Greenz, 2013, Manzini, 2015). Underlying definition of design used here refers back to Victor Papanek`s (1985) ideas of design, which he mentions is a conscious and intuitive effort to impose meaningful order. However, social design in the past few years is transitioning to a wider area of application which encompass designing of idea, process, technology as well as new business and social system that support to create a sustainable society (Iinuma,M et al 2014, 2018). Recently in Japan, ideas of social design is often used in context for achieving SDGs. For example, Japan Management of Technology Association (MOT), an association composed of business leaders, academics and government officials in 2017 launched a social design research group as a new way to create sustainable society. Social design in a broad sense aims at social change, promoting cross sector cooperation including educational institutions.

1. Education for Sustainable Development

Education plays an important role in inducing social change for sustainable society. Empowerment of individuals and emergence of participatory citizenship are essential for making changes to achieve the goals for sustainable development. In successful cases, education for sustainable development especially in the higher education level leads to global partnership. Also, with the development of ICT, empowerment of individuals and emergence of new participatory citizenship have become easier than before.

As part of the education for sustainable development, we have developed a requisite course of about 320 second year university students each year at the Department of Media Sciences, Tokyo University of Technology. The main objective of the course is to foster awareness towards global issues that relates to sustainable development, and to think of solutions in groups. There were total of 12 classes taught by part time instructors, each class being up to 30 students.

2. Using Digital Maps for SDGs Learning

In one lesson, the students are asked to study themes regarding sustainable development using digital maps. For example we incorporate Google Earth data to demonstrate the state of natural environment in different parts of the world. Figure. 1 is an example of information on consequences of climate change found in Google Earth that students use. In this example, satellite data of changes in the past decades of the water level in Lake Chad in Africa can be viewed from the timeline on the left side of the screenshot. In addition, one can access information on Nigeria's environmental conservation made open by the United Nations Environment Program UNEP. In addition, numerical values such as human development index HDI released by the United Nations Development Program UNDP can also be viewed. The students can simultaneously look at data on poverty and quality education in the country. By referring to image data and statistical data released on the digital map such as in the example, students discover the problem of designated region or country and deepen their understanding of the problem. The students are asked to investigate examples of initiatives aimed at solving such issues in group and discuss different scenario for change. Ultimately students in groups compile information and create a digital content.

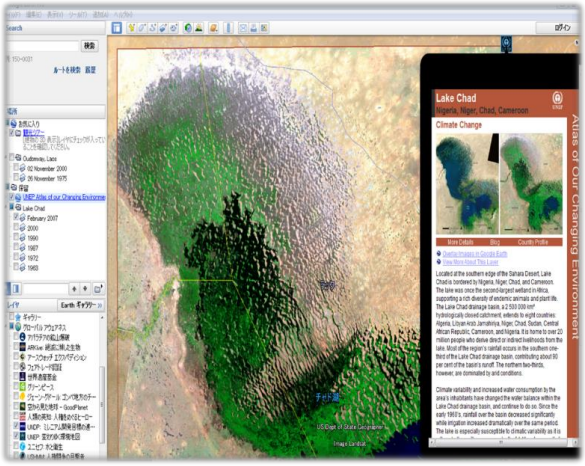

Fig. 1 Google Earth digital map material

Using digital maps such as Google Earth allow students to explore topics on global issues in a more visually stimulating way. Since digital maps can show past and present timelines on how specific regions transformed over time, along with recent photos it can be a great support for better understanding of geography and spatial literacy. It can also act as a rich resource for visual information. While in this particular example, we have used it to show the time lapse of environmental issue such as drought in Africa, other information on digital maps can be used for other SDGs related themes such as World Heritage Sites and Endangered languages and species. These maps can be used as a source of information for students as well as tools to learn geography and spatial literacy.

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United Nations Sustainable Development Goals 2030
http://www.un.org/sustainabledevelopment/sustainable-development-goals/

The Study of renewable energy for Kinetic Sculpture

Waiyawat Saitum

DESIGNING KINETIC ARTS SCULPTURE IN PRODUCING RENEWABLE ENERGY

Waiyawat Saitum

Abstract

Renewable energy means the clean energy such as solar energy, wind power, hydropower, etc. These sources of energy will be the world's major resource of energy in the near future. Although the efficiency of the renewable energy production is still low comparing to its cost, but the development is continuously on the way. Currently, the usage of solar energy in Thailand is still limited mostly to the household or industrial usage. In terms of art, solar energy application for aesthetics propose is rare. However, the problem of using the solar panel in any design would be limited technically to the fact that the solar panel must face the sun directly for the full light exposure and maximum efficiency. On the contrary, the artistic beauty might not require the maximum efficiency but rather focus on the aesthetic quality.

This article aims to present the experiment result and confirm that the planar which could face the sun in multi directions would affect the design, which might not always have to face the sun directly. The multi-direction planar would lead to more variety in artistic design and the interesting forms of aesthetic qualities. Apart from the artistic benefits, this study could also lead to the various product designs to increase utility and respond to the consumers' needs. In this study, the researcher selected the Monocrystalline solar cell (mono-Si) to experiment in electricity production, together with wood and wire for the sculpture model. The study process started from 1. Site Assessment: Specific location by Latitude will be achieved I. Altitude II. Seasons III. Sunlight direction IV. 2. Photovoltaic Layout Design 3. Design of Model Sculpture 4. Observation 5. Solar Correction Data for Electric Power 6. Experiment of energy to use in Art. The experiment results confirmed that it was possible to create a sculpture which could generate electricity. The electricity generating instruments could be built and incorporated as a part of the sculpture without requiring any dismantlement. Therefore, the artistic beauty could be combined with the scientific usage appropriately.

Keywords: 1. Solar incident 2. Solar energy 3. Sculpture 4. Photovoltaic 5. Solar cell 6. Light Art

Introduction

Sunlight plays an important role in the natural way of life, as human and animals must feed on the plant which require sunlight to grow. Moreover, the sunlight could also generate energy. And when human could find the way to utilize the solar energy through the research and development, it could be the major source of energy which could respond to the basic need of the human life efficiently. Since then, the solar energy became a crucial source of clean energy for human life sustenance due to its renewability, as Huang and Wu said that "Renewable energy is a sustainable and clean source of energy derived from nature" (Huang YH, Wu JH., 2007, pp. 345)

The sunlight ray is emitted in the form of wave. The solar cell, or photovoltaic (PV) cells, was thus invented to transform the wave energy into electricity. Pearsall and Hill wrote that "PV gets its name from the process of converting light (photons) to electricity (voltage), which is called the PV effect". Solar cell was first discovered by the scientists at Bell Telephone, who found that silicon could generate electricity when exposed to sun. Due to its direct conversion of sunlight into electricity which does not require any moving part nor generate any emission, the solar cells became widely used and could be found from in the small consumer products such as watches or calculators to the space satellites and large power stations feeding electricity into the grid. (Pearsall NM, Hill R, 2001, pp.1) Chenming Hu also defined photovoltaic effect as the phenomenon of producing voltages and currents from the solar cells, which are "the devices in which sunlight releases electric charges so they can move freely in a semiconductor and ultimately flow through an electric load, such as a light bulb or a motor". (Chenming Hu,1983, pp. 6)

Generally speaking, sculpture means the work of art which could be created from wood, stone, metal, or plastic, etc., in both two or three dimensional form. As a form of visual art, sculpture express the formal aesthetic and the implicated meaning. Like all visual art works, which usually involve light in some degree, the sculpture must also be exposed to light in order to express its full aesthetic potential, especially the outdoor sculpture. There is also another emerging form of visual arts called "light art", as mentioned by Russell P. Leslie (2004) that "there is, however, a growing interest in light art, or the works of art in which the light is a primary medium." He continued that although the boundary between light art and other visual art maybe blurry, but the development in technologies and arts allowed more pieces which seems to be

the light art more than any other type of visual arts to be created. And light art could now be found in both permanent and temporary venues. (Russell P. Leslie, 2004, pp. 28).

Figure 1. Lightpaintings, Artist : Stephen Knapp, accessed 27 November 2018, <http://www.lightpaintings.com/>

As mentioned above, there is the possibility that the art sculpture could be combined with Photovoltaic cell, and create both beauty and the energy support for further usage. This could blur the line between art and science together, and could express the stylishness of the renewable energy as an art object. The further development for daily life application would confirm that the sculpture could offer note only beauty but also the energy which would be beneficial for everyday usage.

Therefore, the purpose of the research was to develop the design guideline for art sculpture that could generate renewable energy with photovoltaic cells, which would be beneficial in the development of kinetic arts, sculpture, and light art. The research methodology is practice-based and include the process of creating sculpture using local materials. The final output would be the design guideline to create sculpture with the major concern about the sunlight. The result of this study could be a guideline or inspiration for any designer or sculptor to enhance their imagination, to create beautiful works, to fulfil a design project, or to incorporate the energy value into the work of art.

Photovoltaic Layout Design

In order to generate enough electricity for the components which would be incorporated, it was necessary to know how much energy should the component need in order to work. Afterwards, the solar cell layout must be designed, with the major concerns of the current and voltage. Firstly, the photovoltaic cell must be select with the consideration of its current and voltage capacity. Then the amount of photovoltaic cell needed in order to generate enough electricity would be calculated.

I. The instrument used in this experiment

a. Motor – a small type motor of 6V 150 mAh

b. Solar cell (Monocrystalline) - 2V 45mAh size 30x30 mm Micro Mini Power Small Solar Cell for DIY light toy.

II. The design of electrical circuit

In order to generate enough power, it was necessary to consider the current and voltage. If any of them is not enough, the component would not work, or might work inefficiently. Generally, any electrical circuit would be different in terms of flexibility and the characteristic of current and voltage, depending on the circuit connection and the resistor or the electric instrument connection. There are three types of circuit connection as following.

a. Series Circuit

Series circuit is the serial connection of components from one end of a component to the other component. The end of the last component would be connected to the cell. The sum of voltages across the circuit will be higher than the voltage in the parallel circuit

b. Parallel Circuit

When more than two components are connected together in a separate loop, by connecting the same end of each component together, and connect the end of the connected wire to the cell. The sum of the currents would be higher than the series circuit.

c. Compound Circuit

Compound circuit is the use of both series and parallel circuits together, which is mostly found within electronic usage but also possible for other type of applications depending on the appropriate usage. There is no fixed rule for the compound circuit.

All of Solar cell would be added with parallel and series wiring combination. In the series circuit, the total voltage is equal to the sum of the voltage of each cell, and the current

is the same as any single cell. In the parallel circuit, the total current is equal to the sum of the current of each cell, while the voltage remain the same for each individual cell. Power is voltage times current.

In this experiment, the researcher incorporated the small motor, which required 6 V 150 mAh, with the photovoltaic cell and could generate electricity of 2V 45 mAh. In order to reach the required power, the compound circuit was used so that the current and voltage would reach enough level for the motor. However, as the photovoltaic cell did not all face the sunlight directly, the total power would be decreased. Thus, the researcher added more solar cell to compensate for the loss of electrical power when the planar was tilted. The solar cell panels were increased from 6 rows and 4 columns, which would generate 6V 360 mAh, to 6 rows and 5 columns, which would generate 6V 450 mAh. The photovoltaic cell layout followed the diagram in figure 5.

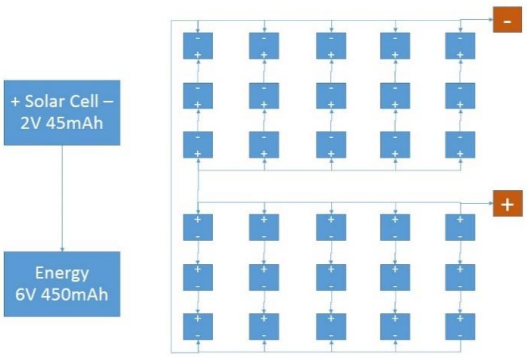

Figure 2. 30 pieces of Solar cell DIY light toy would be added with parallel and series wiring combination in 6 rows and 5 columns.

Design of Model Sculpture (Planar surface)

For the purpose of the study, it was hypothesized that planar surface of model constitutes a tilt array for the highest value of energy generation. The solar cell attached on the surface was designed with the following parameters: number of planar per model (if there are separated), long period receiving energy and array spacing.

I. Model Surfaces

Dmitri Kozlov (2013) wrote about the structure of planar surface that it consisted of three major elements; the planar facets (F), linear edges (E), and point vertexes (V). When these three elements are combined, the sub-units of surface would become the larger surface with the new different forms. The folding of the two major elements; the planar facets (F) and linear edges (E) would especially become the hinged flat faces and the triangular surface as shown in

figure 5a. Another type of structure, or the kinematical nets with non-triangle meshes is also possible as shown in figure 6b.

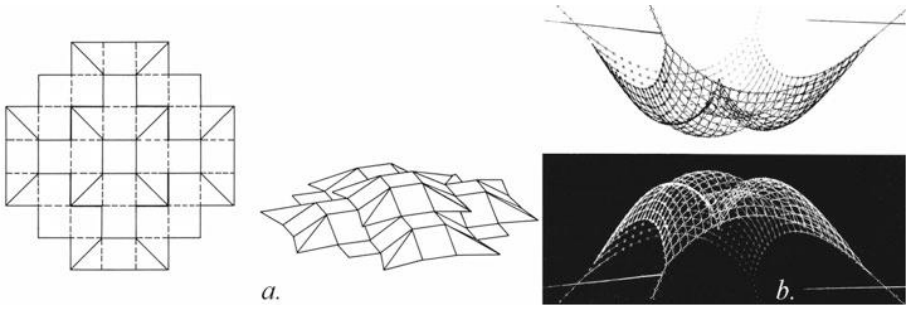

Figure 3. x.Transformable surface models: a) folding structure (Vranka 1990: 9);
b) kinematical net (Otto, Burkhardt and Hennicke 1974: 130)

Furthermore, Shirley Jo Probert (2014) studied about the combination of the geometric forms and found that the emergence of space would start at the origin of the set of all points. Then the sets of points would be divided, and connected together by the line, which would led to the paths (both straight and curved). The crossing of the paths become the intersecting lines which divided the region and finally become the plane. (Shirley Jo Probert. 2014, pp 24-25).

II. Shape

The various shapes could originate from the folding of the sub-planes in multi-direction, which would become the various shapes that constitute to the new form, as Dmitri Kozlov (2013) wrote that “The shape of architectural objects in general can be treated as envelopes: 2D surfaces embedded into 3D space. (Dmitri Kozlov. 2013, pp 253)

III. Proportion

According to the study by Katherine A. Liapi, it was found that the proportioning systems are crucial for the visual aesthetics, as the fundamental of division would be combined within the structure. For example, the golden ratio and other man-made geometric forms, which follow the example in the nature and re-arrange them to create the different beauty could be found clearly through the architecture and objects closed to human. (Katherine A. Liapi. 2002, pp. 80).

Generally, the standard solar panel layout design would be in the form of array facing sunlight at the spot with best average light exposure all day, after already considered the changing position of the sun although the year. The planar array would be without any curve nor tilting in other direction as shown in figure 4. However, the researcher started by laying each

solar cell panel into grid with 6 row and 5 columns in this model, then used the calculation table to plan the tilting of each plane. The rotation axis would refer to the horizontal X and vertical Y axis. For example, the horizontal plane at X3 and vertical plane at Y3 would be tilted towards X,Y = 0,-15 degrees. And after the tilting angle of each plane was input into the table, the total tilting angle for all 30 panels could be shown as demonstrated in figure 5.

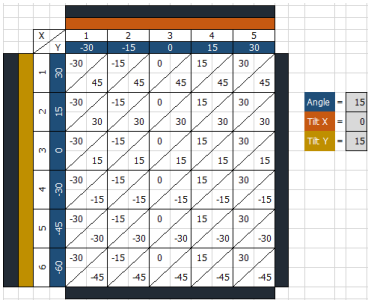

Figure 4. Standard solar panel which have flat surface intend to face against to sunlight. (Left)

Figure 5. Calculation table suggest for an angle of each planar surface should rotate. (Right)

From the above principles, the model was mainly designed to receive sunlight from morning until evening. Each pieces of solar cell may generate and compensate energy for each other, as each panel would be tilted towards different angle (figure 6). For an example, the model in this experiment was basically design for the observation site on Thursday 22th February 2018 (Summer season) at the top of a building close to Bangkoknoi canal in Bangkok, Thailand (13° 46' 44.3136" N; 100° 28' 9.012" E), which the solar noon period, or the moment when the sun appeared at the highest part of the sky compared to its positions during the rest of the day, was 12.33 PM. At that moment, the angular direction of the sun in the sky could be projected perpendicularly onto a reference plane (at an observer point) call True North-Based Azimuths, which equals 180 degrees from the north in this case (Figure 7), or around noon time.

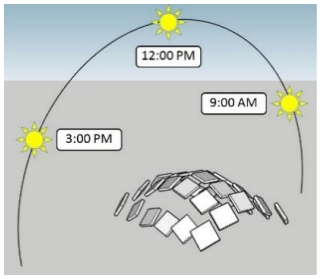

Figure 6. Shows 3D model of Solar cell position and facing to impact sunlight during day period. (Left)

Figure7. Zenith angle of the Sun on Thursday 22th February 2018 in Bangkok, Thailand (13° 46' 44.3136" N; 100° 28' 9.012" E) in 12.33 PM (Right) - http://suncalc.net.

After tilting each panel to the desired angle, the researcher incorporated the curve plane so that the overall look of the model would resemble the earth's curve, in order to track the change of the sun's position in the north and south during the different season althrough the year. Figure 8 showed the front view, side view, top view, and perspective of the model. The top row was the regular image, while the below images were the model after the curve plane was incorporated. The overall look would be protuded up and allow the model to receive light in multiple periods.

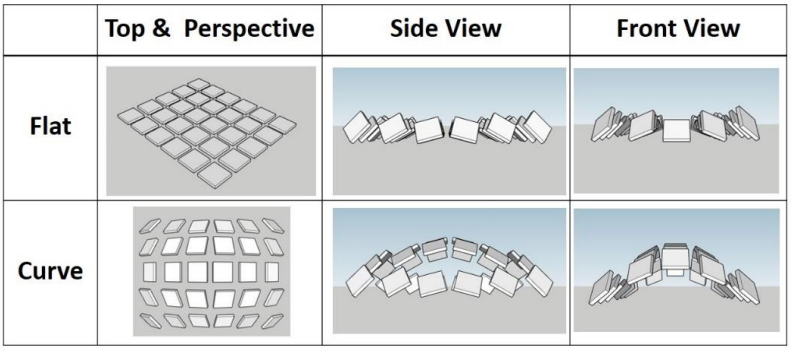

Figure 8. Design of model included curve of earth's surface plane in Front, Side, Top and Perspective view.

The curve in the X axis was designed to face the sun during the day, from dawn until dusk, which the sun would rise from the east towards the west at the end of the day. When looking from the top, the sun would seems to move from right to left. Therefore the tilting towards the sun in the X axis would allow the solar cell to be exposed to light in multiple period. Thus, the energy generation could be compensated this way

On the other hand, the curve in the Y axis was designed to face the sun during the year. As the earth's axis was tilted at 23.5 degrees, seasons could be observed when the earth's position was changed. When looking from the earth's surface, the sun's position would seems to move from the north to south. Therefore, the tilting towards the sun in the Y axis would allow the solar cell to be exposed to light in the wider periods in each month (or season) and could also compensate the energy production as well.

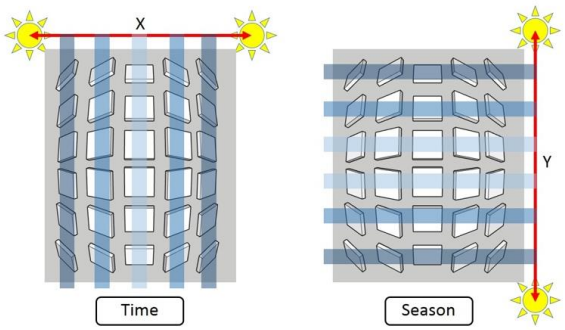

Figure 9. The curve of the layout would allow the wider period of light exposure, as the tilting in the X and Y axis served different functions.

The Model Construction

The solar zenith angle, or the angle between the zenith and the center of the Sun's disc for Thailand, which located at the coordinate 15.8700° N, 100.9925° E, would generally be around 15 degrees all year round (Waiyawat Saitum. 2016, pp. 260). Therefore, to avoid the regular layout of solar panels which face the sun in just one direction, it would be necessary to consider tilting the panels which would affect the exposure and energy generation. Previously, the researcher found that more FEV could be added for more complex shape by simple method of connecting two planar surface together the 15° / 15° tilting. When 5° was minus for the first one and 5° was added for the other, the surface then connected at 10° / 20°. In this case, the average of sunlight will share the incident on both planar surfaces as shown in figure 10. (Waiyawat Saitum. 2016, pp. 260).

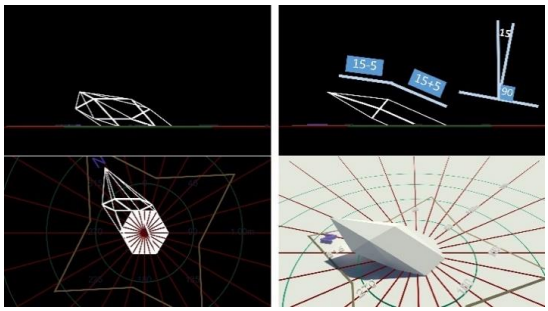

Figure 10. Shows 3D model develop for more complex shape. (Waiyawat Saitum. 2016, pp. 260).

In order to proof the effectiveness of this design, a simple model was constructed with wooden base which was drilled in grid of 6 rows and 5 columns, with equal gaps between

the grid. Afterwards, the researcher put the aluminum wire connected to the photovoltaic cell panel through each hole. The solar cell panel was 30x30x30 cm in size, with the adjustable joint which allowed the adjustment of tilting angle. The leg was also screwed to the wooden base so that the angle was tilted at 15°, in order to face the sunlight directly, as shown in figure 11.

Figure 11. Observation model upper-left : front view, upper-right : side view, lower-left : top view, lower-right : perspective view.

Observation

The observation process included data collection by the wattmeter at every hour starting from 9:00 – 15:00, on Thursday, February 22nd, 2018. The data was fluctuated due to the weather condition, which was partially cloudy and rainy as shown in figure 16. Therefore, the researcher added another observation day on Wednesday March 7th, 2018, and find the average data from both observation.

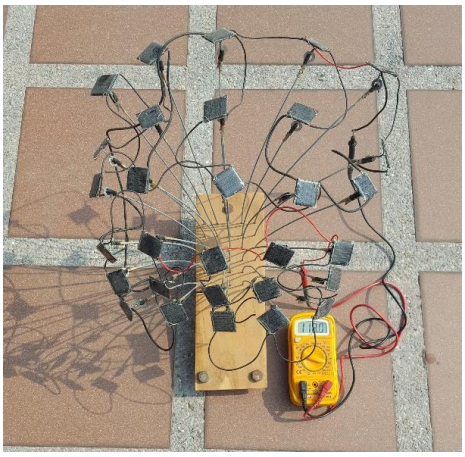

Figure 12. Exposing the model to the sunlight with wattmeter, in order to observe the design effectiveness. (Left)

Figure 13. The weather condition of bright sky and partial shade. (Right)

Solar Correction Data for Electric Power

Date / Time	Electricity	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	Average
22-Feb-18	V	6.40	6.49	5.89	6.80	6.35	6.66	6.19	6.40
	mAh	75.50	116.60	25.80	175.00	62.90	159.30	42.00	93.87
	Wh	0.48	0.76	0.15	1.19	0.40	1.06	0.26	0.61
07-Mar-18	V	6.43	6.50	6.54	6.62	6.65	6.63	6.49	6.55
	mAh	79.00	109.90	139.00	166.50	144.70	152.30	105.90	128.19
	Wh	0.51	0.71	0.91	1.10	0.96	1.01	0.69	0.84

* V=Volt / mAh = Milli Amp / Wh = Watt per Hour

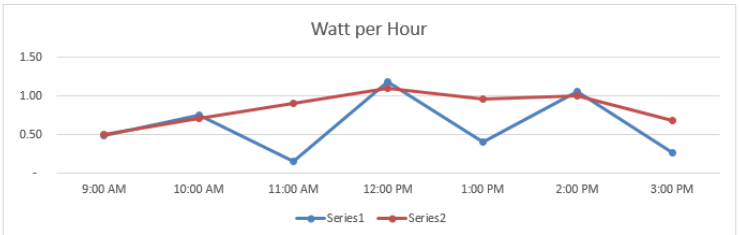

Table 1.The number of watt measured by wattmeter, with the unit of V, mAh and Wh

According to table 1, the electricity power was fluctuated on February 22nd, 2018 due to the cloudy weather condition, while the measured data on March 7th, 2018 was more stable. In both observations, the peak hour of energy generation was at noon, when the solar radiation intensity peaked. When calculate the measured current and voltage into watt-hour, the overall power was enough to run the prepared motor.

Experiment of Energy Usage in Art

Creativity requires complex thinking from various perspectives, active thought, initiation, flexibility, and details as well as connecting the relationship of things together. Only then could the new innovation could be created and led to the problem solving (Tichaponn Namwong, 2017, pp.20). Mixed-media art is a genre of visual arts which combine visual art materials together with other artistic disciplines, such as light, sound, movement, or olfactory object. Other visual art works which are above the mentioned criteria are also under the swift and continuous development, and might be called differently (Rewat Suksikarn, 2012, pp.6). Drawing is the most fundamental form of artistic expression which could be found generally in visual arts. Human usually draws by hand, holding the instrument such as pencil, pen, or brush. As the researcher attempted to combine the art and science together in order to explore the new possibility of artistic expression, the motor which was powered by the model mentioned above was connected to the brush pen. When the motor rotated, it also moved the pen. The researcher then adjusted the pen vertically and let it touch the paper as shown in figure 14. After a while, the drawing in figure 17 was generated.

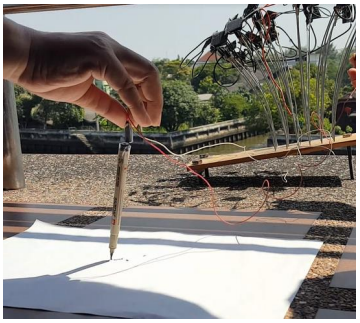

Figure 14. Connecting the model with the motor and the brush pen over the paper (Left)

Figure 15. Art work from the brush pen rotated by the solar energy (Right)

DEVELOPING THE KINETIC ART SCULPTURE

There would be two major elements; the sculpture and the column beneath it. The sculpture would be above the eye level of the audience, and the column would be embedded to the ground underwater.

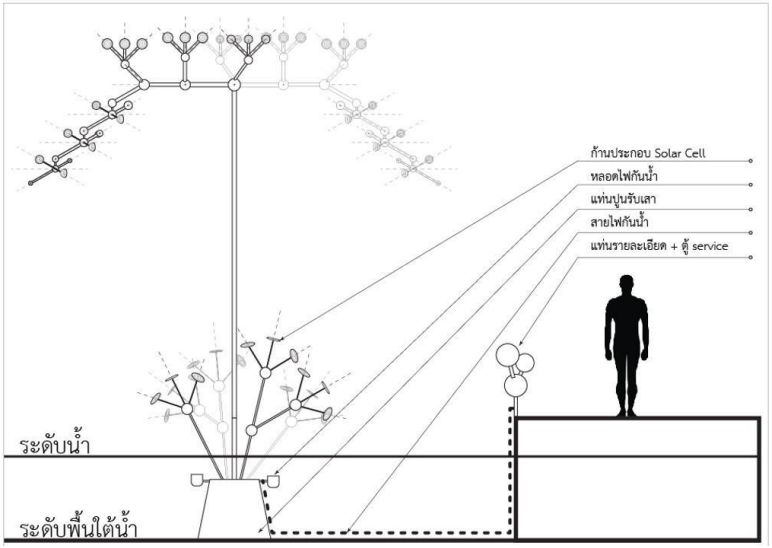

Figure 16. The overall design. By Researcher.

From the top view, there are three arms, which is divided into 6 joints. Each joint consisted of an axle connected by the spheres which gradually change in size from large at the trunk to small at the tip, which can be called A joint at the tip to F joint at the trunk, according to figure 16. Each arm would be installed in different direction, at the angle of 120 degrees. Joint D and E would be twisted counter-clockwise at 30 degrees each. When the arms are fully spread, the diameter of the sculpture would be 5.4 meters. Each arm of the joint A, B, and C could spin with the blades installed according to the picture.

Summary

According to the diagram 5, the researcher can summarize Kinetic Art creation into seven main processes as follows;

1. Art & Science in Sculpture model

The creation of the sculpture involving a technology needs to consider two major parts. The first part is the art that create an aesthetic experience. The other part is science that uses a specific technology, blending these two disciplines together creating a sculpture made from basic materials, integrating a present technology, creating a unique piece of art.

2. Factors : Sunlight, Wind and Planar Surface

In order to integrate technology with art, related factors need to be considered inevitably as all technologies have both capacities and limitations. Therefore, all-around factors needed to be considered. In this research, renewable technology, especially solar and wind energy were the sculptural creation topics. In order to use this energy beneficially to the sculpture, the adjustment of the installed applications quantity was needed to be taken into consideration. Moreover, the appearances needed to be designed to fit with the mentioned energy retrieval.

3. Solution for Space and Environment

The harmonious integration of Art and Science becomes a new balanced design direction resulted from restrictions. In the other word, the success came from systematic problem solving procedures. This creates a design pattern for new sculptural format to follow. Variations in the sculpture design depend on many factors such as; installation area, surrounding environments, color of the surrounding architecture or nature, bird sound echo direction, etc. The soil's smell and humidity also affect the art work's construction material. Climate is another factor that will impact the ArtWork creation, if the sculpture relies on natural energy such as sunlight and wind.

The factors mentioned above will differentiate the art work as it will result from the cause and effect of the surrounding contexts.

4. Function and Aesthetic through Technology and Material

Technology was invented to serve some human needs. Thereby, technology must come along with some using abilities, or what we called “function”. Function determines material use that will respond to a specific use, creating a proper efficiency. Another additional thing to consider is a material compatibility as it affects the sculpture’s visualization, which will enhance the aesthetic dimension in the work of art.

5. Kinetic Art

From the design with an integration of function and aesthetic, a sculpture work that associate a natural energy occurred. When an energy source generates movements, we call this an illusion-move Kinetic Art. This art works by using visual elements that shake and overlap. It moves by itself from the mechanic powers.

6. People and their Satisfaction, Inspiration and Learning.

Viewing the Kinetic Art, the first impression of the viewers is a movement along rhythms of natural creation. Satisfaction of the viewing aesthetic can lead to the source of inspiration that produced art creation, as well as, encourage the continuously learning in other topics which can be adapted with.

7. Innovation

The nature cannot change itself. However, human can adapt, finding a new way to change some realities. All these changes are to benefit human living. In other words, human can use their own intelligences to design and adapt surrounding things to benefit an everyday comfortably living. Each design is an advancement of thoughts that sums up, which results in new design innovations that evolve from the past, and then continue to the future. However, the pros and cons of the design must be taken into account inevitably to improve the next design. Moreover, inevitable factors such as the natural energy impacts must also be considered.

Recommendation

1. The researchers found that the creation of an artwork that relies on other external factors must thoroughly study those factors, before consider them as associated factors. Those factors shall comply with art work contexts, not only sketching coloring, sculpture but also architecture, to be consistent in order to create the art smoothly and with fine qualities.
2. The complete change of the design forms, from their previously existing, can lead to design directions, even the design has not completely solve the problems. This change could be adjusted to the design improvement in the next stage. This is the discovery of the design that suits the artist identity.
3. Regards the site-specific design, the essential thing is to collect all surrounded details that occurred naturally, such as direction and shade if sunlight, winds that flow through the building, waves ripples that hits the stone. These are important information for a design. Very small things that seem irrelevant can also still affect the overall.
4. Some of the problem occurred due to the context of the site such as the area, surroundings, requirement from the contributor, which led to the suitable artistic design for the particular context. Hence, the designer must create the balance between beauty, suitability, and function.
5. The design which incorporate electric component is one of the factor which must be considered in adjusting the form, as it became the criteria for design to cover the required parts for the particular component. However, the component must be connected in order to function. This might disturb the beauty of design and thus require the solution which would harmoniously ensure both function and beauty.
6. In studying the work from successful designer or artist through literature review or the actual installations, the designer must be careful not to let the influences from those works to manifest in one's own work. The study

could be just the point of inspiration for developing one's work, by redefining and refining such works in order to create progress. Utilizing the existing concepts without any further development would led to the plagiarism, by recreating the works without any originality from oneself in the work. Then it would be just another old and ordinary work, not a creative one.

7. Apart from creating beauty in the area for people's relaxation, there could be the public function of the sculpture. But the sculpture which could move by the wind energy together with electrical component utilizing solar energy from photovoltaic cell would require regular maintenance. Therefore, the convenience in maintenance is another concern, as it would ensure that the sculpture would not be ignored and would be well-cared for. In some case, the adjustment for easy maintenance might require the adjustment of sculptural form for this reason. Hence, it is the direct duty of the designer to balance the design for aesthetic, function, and maintenance.

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Homophobia Test by Virtual Reality Game

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Homophobia Test by Virtual Reality Game

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1.Significant and Background

All people have a fear in the mind. The fear of what is both concrete and abstract as fear of heights, fear of dogs, or fear of darkness in individual balloons may affect the everyday life. These individuals must be made aware of what to do with fear and seek to maintain

Candidates is interested in game development. The use of VR systems simulation, virtual reality to test phobia of blood for those who have a phobia of blood using Unity to develop the game and using Autodesk to create the character of the game is spent. blood testing refusal to observe the conduct of the trial and analyze the diagnostic criteria for mental disorder ICD-10 to allow the trial to know the symptoms of blood scared.Can find a way to cope, and the therapist is afraid of blood.

2.Research Objectives

The objectives of the research were:

1) To develop Homophobia Test by Virtual Reality Game.
2) To find quality of Homophobia Test by Virtual Reality Game.
3) To evaluate the fear Homophobia - behavior of the sample.
4) To evaluate the satisfaction of the sample, The research tools consist of Homophobia Test by Virtual Reality Game and questionnaire.

3. Research Methodology

3.1 Population

Population are the 328 undergraduate students in Computer and Information Technology, Faculty of Industrial Education and Technology, King Mongkut's University of Technology Thonburi.

3.2 Sample

Sample are selected of 40 people from population by using Yamane's appropriate sample method [7], divided into 12 people who were afraid of blood and were not afraid of blood 28 people

3.3 Research Tools

The following tools were used in this research.

1. Homophobia Test by Virtual Reality Game.
2. Quality assessment form for psychologists.
3. Quality assessment form for medical experts.
4. Quality assessment form for by virtual reality experts.

5. Satisfaction evaluation form for the sample group.

3.4 Data Collection

The researcher collected data as the following steps.

1. Data collection for quality evaluation by the experts
2. Data collection for population satisfaction evaluation.

3.5 Data Analysis

The value of the score obtained from the quality evaluation form By virtual reality experts and sample groups to find the mean value in each topic, then apply the mean value of each topic to the measurement criteria, in order to find the result of the quality of Homophobia Test by Virtual Reality Game.

4. Research Result

Proceed to create Homophobia Test by Virtual Reality Game. Which has a play time of about 10 minutes by presenting the content of the situation that must be met with 3 situations Including medical psychology, virtual reality Get the conclusion As the following table: -

4.1 The results of the quality evaluation of Homophobia Test by Virtual Reality Game

by psychologist experts.

Table 4.1 average and quality level by psychologist experts.

List	Average	Quality Level
1. Motion animation to tell the story came out very interesting.	5.00	Very Good
2. The content of the story easily understand.	5.00	Very Good
3. The presentation media has the appropriate presentation time.	5.00	Very Good
4. The combination of dance and storytelling with video creates interest for the media created.	4.00	Good
5. Camera techniques and camera angles are interesting.	4.00	Good
Scores	**4.60**	**Very Good**

From Table 4.1 analysis result showed that the quality of reality games was in the very good level. The average was 4.60.

4.2 The results of the quality evaluation of Homophobia Test by Virtual Reality Game by medical expert.

Table 4.2 average and quality level by medical experts.

List	Average	Quality Level
1. Game content is accurate.	3.00	moderate
2. The images used in the test are accurate.	3.00	moderate
3. Can transfer medical content very well.	3.00	moderate
4. The location used within the game is consistent with the content.	4.00	Good
5. Virtual reality technology can help explain medical work better than Other types of media.	4.00	Good
Scores	**3.40**	**moderate**

From Table 4.2 analysis result showed that the quality of Homophobia Test by Virtual Reality Game by medical expert was in the moderate level. The average was 3.40.

4.3 Results of the quality evaluation of Homophobia Test by Virtual Reality Game by virtual reality experts.

Table 4.3 average And the quality level by Virtual Reality expert.

List	Average	Quality Level
1. The characters are accurate, realistic.	5.00	Very Good
2. The surrounding elements are consistent with the characters and cause interest.	5.00	Very Good
3. The color used is appropriate.	4.00	Good
4. The images used in the game convey the content that is clearly presented.	5.00	Very Good
5. The overall composition of the game gives a more realistic feel to the medical work better than Other types of media.	4.00	Good
Scores	**4.60**	**Very Good**

From Table 4.3 when considering the average score of virtual reality assessment It was found that the overall quality was 4.60, therefore, it could be concluded that the quality Homophobia Test by Virtual Reality Game is very good.

4.4 Results of fear behavior tests on Homophobia Test by Virtual Reality Game By the sample who was afraid of blood

Table 4.3 Table showing average, standard deviation And the level of fear behavior towards the Homophobia Test by Virtual Reality Game, By the sample who were afraid of blood.

List	Average	Standard Deviation	Quality Level
1. Have a heart beat Fast heart beat Trembling.	3.58	0.79	High
2. Have difficulty breathing, chest pain.	3.33	1.07	Moderate
3. Head suppression, fainting, or fear of death.	3.42	0.90	High
4. Muscle tension, stress or anxiety.	3.08	1.08	Moderate
Scores	**3.35**	**0.96**	**Moderate**

From Table 4.4 the results showed that the satisfaction of the sample group was in the moderate level. The average was 3.35 and the standard deviation was 0.96

4.5 Results of satisfaction evaluation for Homophobia Test by Virtual Reality Game By sample group

Table 4.5 Table showing average, Standard Deviation, and satisfaction

List	Average	Standard Deviation	Quality Level
1. Homophobia Test by Virtual Reality Game is interesting.	3.60	1.11	High
2. Virtual reality technology is realistic.	3.63	1.12	High
3. The amount of content is appropriate.	3.50	0.99	High
4. Letters and 3D models are appropriate. Can see clearly, comfortably	3.46	1.18	High

5. Sound and music are appropriate.	3.46	1.22	High
6. The equipment used in the test is appropriate.	3.48	1.47	High
Scores	**3.35**	**0.96**	**High**

From Table 4.5 the results showed that the satisfaction of the sample group was in the high level. The average was 3.35 and the standard deviation was 0.96

5. Discussion

After analyzing the data and developing the Homophobia Test by Virtual Reality Game, it was found that there was a difficulty in creating sufficiently, those who created this type of work needed special expertise. The organizers therefore took into account the fact that the reality of the game was abandoned by adhering to the most realistic creation principles, as if the experimenter had entered the situation manually, based on expert evaluation results. Found that they can understand the contents of the story easily Camera and camera angles are interesting. In addition, the Virtual Reality technology is able to display realistic simulation scenarios. Which is a technology that can be used to extend Is the application of appropriate technology The content in the game is quite complete but still needs to be modified or improved.

6. Reference

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Programming for Children

Takuya Terasawa

Programming for Children

Fri. Jul. 5th 2019

Prof. Takuya TERASAWA
School of Media Science
Tokyo University of Technology

Abstract:

In this talk, I will show you our activities on programming for children following to the background of the ongoing drastic changes in education in Japan.

As you know the development of IT/ICT is remarkable. That includes cloud computing, big data processing, IoT/CPS, social computing, xR, and AI. To follow these movement, Japanese Government advocate "Society 5.0" that is the fusion of cyber world and physical world both for economic growth and solving social problems. It is based on ICT like IoT and AI. In last decade, as represented by AlphaGo, AI technology advanced dramatically especially in machine learning and deep learning. Some researchers including Prof. Michael Osborne of University of Oxford argue that a part of current human jobs will be replaced by AI in near future.

In that a world, children and students will be desired to have creativity, ability to combine knowledge and to apply it to new problem, and social skills (communication skills). But traditional education in Japan does not fit for current needs of education for young people. Children and students should have more training on logical thinking not on memorizing. Ministry of Education (MEXT), an agency of Japanese Government, along with some other agencies have come out with programming as a means of training of the logical thinking and also provide chances to learn about ICT through experiences for children. The education for programming will start in elementary schools in next school year.

To follow these changes, many companies or organizations started seminars or schools for programming for kids. We have two activities for it. One is a child programming course in collaborating with Hachioji city, and the other is HIRAMEKI (inspiration) ICT Club. In my presentation, I will show you these activities. Then, finally, I will talk about some courses at School of Media Science, TUT for learning CPS/IoT.

POSTER SESSION

Web Authoring System and Web Template Management System for Promote Public Relation

Candidates : Miss Jongrak Numpitsanu
Mister Sopon Goongit
Project Advisor : Asst. Prof. Chanin Tungpantong

Motivation

At present, the website has become an important tool that allows users to more easily access resources on the internet. The popularity of the website results in increased demand for website creation. But building a website requires manpower that has skills in writing websites. Tools, skills and design skills it also takes a long time to create a website and the budgetis is quite high according to such principles and reasons. We have created and to developed a system to help and to manage ready-made websites for public relations for users who do not need computer language knowledge to create websites

Approach

We use SDLC to develop systems to web authoring system and web template management system for promote public relation

Problem Definition

Creating a website is difficult. Because of the need to use knowledge of programming skills and website Design skills

Analysis

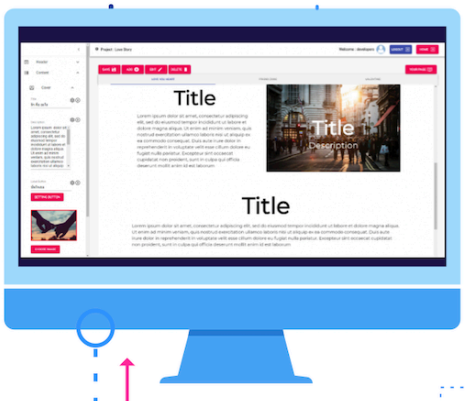
The system is very responsive to users. Easy to use, fast, efficient Safe And supports sign-in from multiple channel

Design & Development

React x Redux

Allows the system to send information and display results quickly.

Use

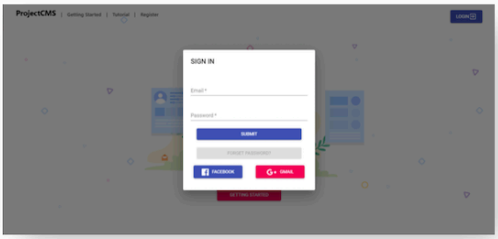


Data Transmission

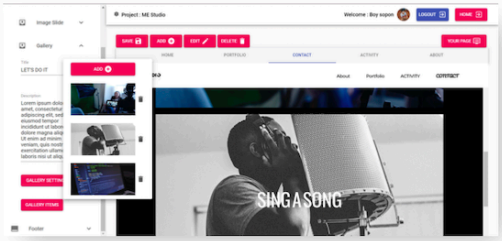
Firebase Database

- Good Security System
- Real Time
- Fast flow data
- NoSQL

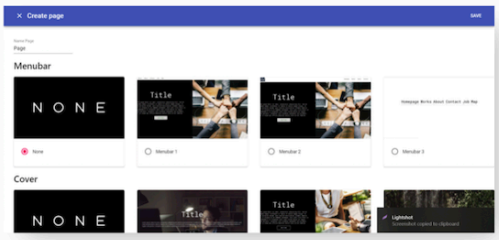
"Login system"



"Image Function"



"Template fucntion"



Conclusion & future work

In the future, developers will develop a variety of web template formats. Able to support the use of various devices, can guarantee the use of various browsers and develop in the areas of Search Engine Optimization or SEO that makes the website stuck on top of search

THE DEVELOPMENT OF COMPUTER GAME TO PROMOTING MUAY THAI FOR SENIOR HIGH SCHOOL

Karntida Thumrongyut • Sakgawee Puresrisak
Chanin Tungpantong
Applied Computer Science–Multimedia, King Mongkut University of Technology Thonburi

NAWAARWUT นวอาจุต

MOTIVATION

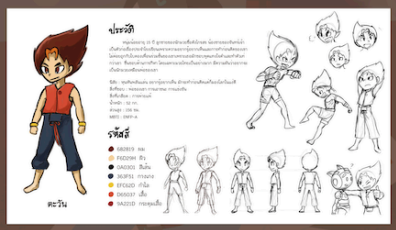
Muay Thai is one of the most famous heritage of Thai culture that was inherit for a long time. Which is said to be a deadly martial art by using body components as weapon. However, there are less appealing for new generation youth nowadays.

APPROACH

We developed "Nawaarwut", a 2D computer game contains with 15 Mae Mai Muay Thais' technique to represents with fighting game. which used various of theories in the development process.

Character Development

Good Character and Animation Design is the most important key to make a good fighting game. So 12 principles of animation and character design theory were implemented for this game.



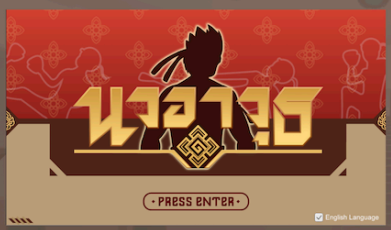
Character Design – Tawan

Game Development

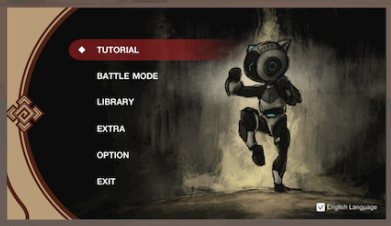
Basic game design theory were implemented as a basis of game development. We also used process of game development as a based of development process.

Process of Game Development

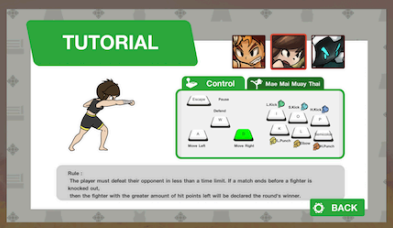
SCREENSHOT



Title



Main Menu



Tutorial Mode

Character Select Scene from Battle Mode

Fighting Scene from Battle Mode

Library Mode

Extra Mode

Option Mode

Character Development Process
(From rough sketch > Lining > Coloring)

CONCLUSION

Game is a type of media that can be use to encourage students to become more interested in content like this project as Mae Mai Muay Thai. It could be better if we can add more system to the game such as story, new gameplay rules.

THE MATHERIOUS

"The game idea to promote learning mathmatics and evolve good attitude with VR Thechnology"

Analysis

Brainstorm and Analysis game system what we want. So game present by 3rd person , Story , Controller Achievment system , upgrade system , Charecter and Content about education.

Design

First of all we must have design story board and create content. The second design game map , level or anything what we want to import in game. and the last one design and search tool for development.

Development

First thing, We use adobe photoshop and illustrator for make 2D Image such as texture , graphic and etc.
2. We use UNITY GAME ENGINE for develope.
The coding have important if you try Unity you will learn about C# (Unity 2019) for develope game system and you can dowload asset at Unity Store.
It will be make you easy. but some asset you can pay such as 3D Model. But if you not gratify you can make it buy yourself at the last thing you can use MAYA for make you custom 3D Model it not easy but it will make you preferred.

Conclusion

This game will be develope forever if you have creative thinking the game is not dead. and our game will be evolve every time. We will improve bug or problem when we found and add more function and content it will make more fun. You can give students play it and get information of player behavior. Be gainful for going to develop next game or level. finally if you successful the game can export to Steam or Nintendo IOS and etc. for give your money.

CONCEPT

what problem about Mathematics? People know it vary hard subjects and some people don't know the way to professional? Yes Mathematics it vary important. More subjects cooperate with math. Such as Physic Chemical Programming and math will make good skill when you learned. Did you know in present to many students can't solve algebra problem. They didn't know how to process with number such as plus (+) , subtract(–) , Multiply (*) and Divide (/) Although They can find the answer but vary slow. Not only Mathematics will race with the time also it' have more subtopics where the kids be hard to understand. We know problem to learn about Mathematics so we have more Idea for solve this problem. The first one we improved new method for learn mathematic. We created 3D game and import Example Topic of mathematics content for make students fun and show how to easy learn mathematics. Because more students like to play game. We use VR Technology for make interactive with students. The VR Technology will be solve student who bored mathematics. And will be evolve good attitude with mathematics. We hope it will success and can solve all problem to make students bored and hate mathematics. And remember Mathematics is not hard when you know how to learn it!

Creator : Alongkron Monwisate Annop chisuksrisakul
Project Advisor : Asst. Chanin Tungpantong
Asst. Suriyong Lertkulvanich
Project Manager : Asst. Natthanun Moolsradoo

Homophobia Test by Virtual Reality Game

Abstract

The objectives of the study were 1) to develop Homophobia Test by Virtual Reality Game, 2) to find quality of Homophobia Test by Virtual Reality Game, 3) To evaluate the fear Homophobia - behavior of the sample and 4) to evaluate the satisfaction of the sample, The research tools consist of Homophobia Test by Virtual Reality Game and questionnaire. Homophobia Test by Virtual Reality Game is a game which simulates blood - related events in a hospital. The game comprises three scenes. In each scene, the sample was face up to an ascending amount of blood. This game has been evaluated by three experts; Psychologist, Medical experts, Virtual reality experts and also by 40 undergraduate students. They are student from the department of Computer and Information Technology at the Faculty of Industrial Education and Technology, King Mongkut's University of Technology Thonburi, as a sample. The assessment results of the study were as follows: The Psychologist found the game good. Medical experts found it acceptable. By virtual reality experts, the game is very good. According to the questionnaire from the sample; it was found that the Homophobia - behavior of the sample is on average level and the sample is found the Homophobia Test by Virtual Reality Game good.

Importance

All people have a fear in the mind. The fear of what is both concrete and abstract as fear of heights, fear of dogs, fear or terror in individual balloons may affect the everyday life. These individuals must be made aware of what to do with fear and seek to maintain

Candidates is interested in game development. The use of VR systems simulation, virtual reality to test phobia of blood for those who have a phobia of blood using Unity to develop the game and using Autodesk to create the character of the game is spent. blood testing refusal to observe the conduct of the trial and analyze the diagnostic criteria for mental disorder ICD-10 to allow the trial to know the symptoms of blood

Objectives

1) To develop Homophobia Test by Virtual Reality Game.
2) To find quality of Homophobia Test by Virtual Reality Game.
3) To evaluate the fear Homophobia - behavior of the sample.
4) To evaluate the satisfaction of the sample, The research tools consist of Homophobia Test by Virtual Reality Game and questionnaire.

The devices

1) Homophobia Test by Virtual Reality Game.
2) Quality assessment for Psychologist.
3) Quality assessment for Medical experts.
4) Quality assessment for Virtual reality experts.
5) Assessment form of behavior, fear and satisfaction for sample group.

Results

The behavioral assessment fear of samples to fear of blood in Homophobia Test by Virtual Reality Game, Which is to question all 4 samples are fear of blood to 5 people, with an average total of 3.20 standard deviation equal to 0.20 that is the fear behavior is moderate.

The behavioral assessment fear of the sample is not fear of blood in Homophobia Test by Virtual Reality Game, Which is the whole question 4, the samples are not fear of blood and 35 had an average total of 1.92 is the standard deviation of the average. 1.10 fears that behavior is low.

The satisfaction of a sample group in Homophobia Test by Virtual Reality Game, Which is the whole question 6 by a group of 40 people with an average total of 3.52 values standard deviation average of 1.20 is good.

The results of the questionnaire. By analyzing blood samples from fear after playing Homophobia Test by Virtual Reality Game. From that question after you have tested you think you scared of blood or not. The blood samples were afraid of 7 people that are not fear of blood by reason of the sample responded to the survey said. I was just gushing blood. The color does not look realistic. 17.50 percent of the total number of sample group.

Candidates :Mr.Natthasit Suksompong & Mr.Naphat Mechamnan
Project Advisor :Lect. Jiruth Patanachan
Program : Bachelor of Science (Applied Computer Science-Multimedia)
Field of Study : Computer and Information Technology
Faculty : School of Industrial Education and Technology

FILE EDIT OBJECT OPTIONS WINDOW

STROKE UNIFORM

Interactive Media to Promote The New Courses of Bachelor of Science Program in Applied Computer Science - Multimedia

Candidates

Miss Suthasinee Meemun

Miss Sutthida Nareepoch

Project Advisor

Dr. Kanittha Bangpoophamorn

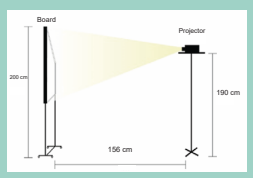
Abstract

The objectives of this project were
1) to create Interactive Media to Promote The New Courses of Bachelor of Science Program in Applied Computer Science - Multimedia.
2) to evaluate the quality of the Interactive Media by experts.
3) to evaluate the sample group's satisfication towards the Interactive Media.

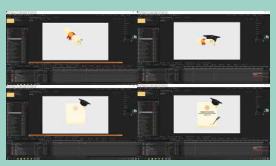
Research Instrument were
1) Interactive Media to Promote The New Courses of Bachelor of Science Program in Applied Computer Science – Multimedia.
2) The evaluation form for experts.
3) The evaluated the satisfication form the sample group.

After that, we also evaluated the quality of the Interactive Media by six experts, and then evaluated the sample group's satisfication. The results of the evaluation process by the experts was in a good level with mean = 4. 36, S.D. = 0.48 the satisfication of the sample group was in a good level with mean = 4.33, S.D. = 0.48.

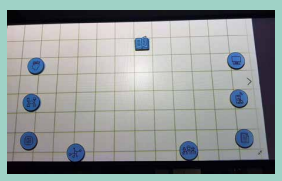
Research methods



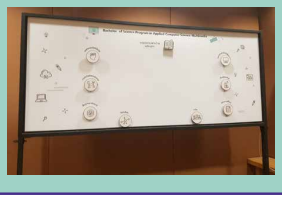
Design Interactive media



Create animetion 2D about
The New Courses of Bachelor of Science Program in Applied Computer Science - Multimedia



Projection mapping



Research methods

evaluated the quality of the Interactive Media
by six experts, and then evaluated the sample group's satisfication

Art Design Integrated AR Technology from Drawings of Disabled children.

Candidates

Mrs. Kanteera Lacumsai 58080500206

Mrs. Rungruchee Thongsoi 58080500254

Field of Study Computer and Information Technology

Faculty Industrial Education and Technology

Project Advisor

Lect. Waiyawat Saitum

ABSTRAC

The purposes of this project is 1. For design art work integrated AR technology from drawings of disabled children 2. To evaluate the quality of art design integrated with AR technology from drawings of disabled children by experts 3. To evaluate the satisfaction of art design integrated with AR technology from drawings of disabled children by samples. The student body population is 50 students and staff at King Mongkut's University of Technology Thonburi. The tools used in the study include; 1. the patterns on a product integrated with AR technology 2. feedback on the viewing of animation media from AR technology. The quality assessment by experts with an average GPA of 4.65 conclude that the art design integrated with AR technology from drawings of disabled children is high quality. The quality of satisfaction from a sample of 50 people found the average to be 4.52. In conclusion the Art design integrated with AR technology from drawings of disabled children is satisfactory.

STATEMENT OF THE PROBLEMS

Project Manager, be considerate of the developmental potential of children with disabilities, especially under the age of 15 years old. With higher potential for art and creativity than normal, they should use the project to design artwork like paintings. Incorporating technology to promote the potential of art is a way to strengthen the imagination of the disabled. They can create paintings and artwork that are creative, by adding value laid down in the products operations with AR technology.

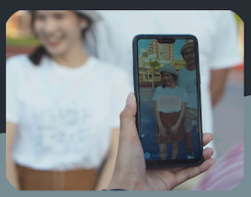
This will create a compelling argument for the audience so they will know the potential of children with disabilities, thus promoting and providing a great opportunity to create something from the disabled.

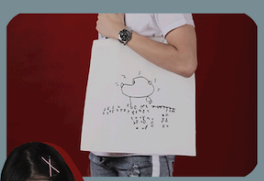
PURPOSES

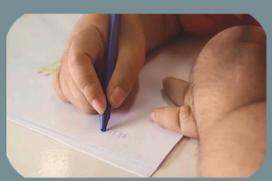
1. To evaluate the quality of art design integrated with AR technology from drawings of disabled children by experts
2. To evaluate the satisfaction of art design integrated with AR technology from drawings of disabled children by samples. The student body population is 50 students and staff at King Mongkut's University of Technology Thonburi

PRODUCT

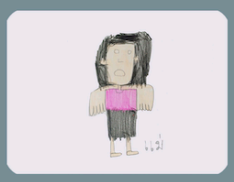
APPLICATION

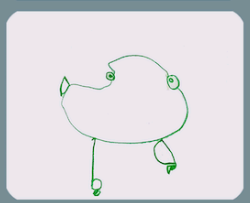




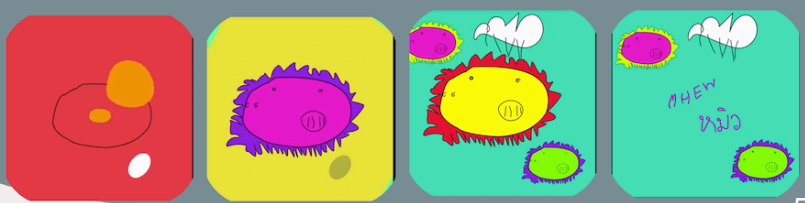


EXAMPLE DRAWINGS FROM DISABLED CHILDREN





ANIMATION WHEN USE AR TECHNOLOGY ON PRODUCT.



Information display and an analysis of visitors' behavior using Beacons and Digitalsignage

Kensuke Kanai and Hideki Yoshioka School of Media Science Tokyo University of Technology, Japan

Introduction

It is expected that a new business model will be created by analyzing people's behavior using sensor technology. Those user data is analyzed and utilized for digital marketing. Also information services using RFID, iBeacon and Apps have been increasing in recent years.

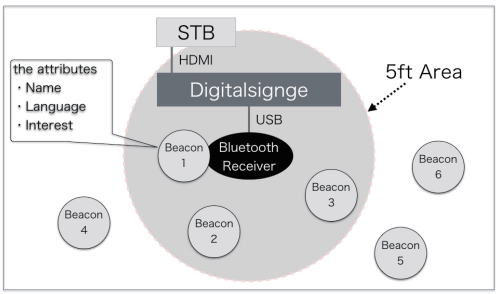
	RFID	iBeacon and Apps
Advantage	Cost-intensive Easier to introduce	It is possible for the user to send information or analyze the behavior
Disadvantage	It is not sufficient data	Require to install Apps

We made a hypothesis that if we had a user with beacon, we could make use of both advantages. This hypothesis assumes that the beacon will become smaller and cheaper in the future.

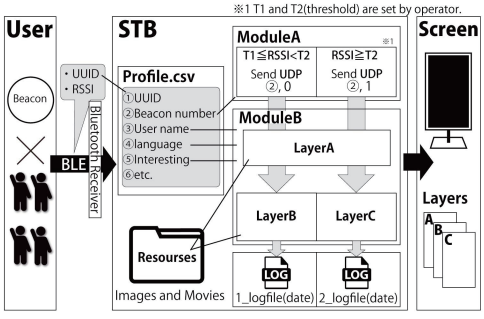
Method

Concept

In this study, we developed the digital signage system that information according to the attributes registered in the beacon is displayed on the screen. We set up names, languages and interests of visitors in the beacon assuming high school students coming to the Open Campus of our University.



System



Results

We conducted an experiment on the open campus held on June 18, 2017. We intentionally induced all visitors to digital signage, because the purpose was verification of this system. In this experiment, we registered provisional attributes.

The above figure show the transition of the number of visitors approaching digital signage. In addition to this data,we can be grasped something as below.

- Transition of the number of people for each attribute
- Number of people who touched the receiver.

From the above, it became possible to understand the behavior and interest of the visitor which had not been visualized so far.

Discuss

We succeeded in acquiring the data of the person who approached with interest in the digital signage and the data of the person who caused the action further by giving visitors a beacon.

1. Operation was as easy as RFID.
2. A system to easily execute to register a attribute information is necessary.
3. Avoiding interference with wifi and bluetooth radio waves.

Conclusion

1. Suggest that data before users take action will be effective for marketing.
2. Using artificial intelligence for data analysis will make it possible to provide smarter information.

Acknowledgment

Experiments in this study were conducted at the TokyoUniversity of Technology's open campus.

References

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Multi Character Animation System for Kids Based on Waveform Following

Alaa ALHERZ, Naoya TSURUTA, Koji MIKAMI and Kunio KONDO
Tokyo University of Technology, Japan

Introduction

Animation making systems can be classified into two types:

1. Traditional animation system
   - Drawing each animation frame is hard task
2. Computer based animation system
   - setting the start and the end of poses on the key frames

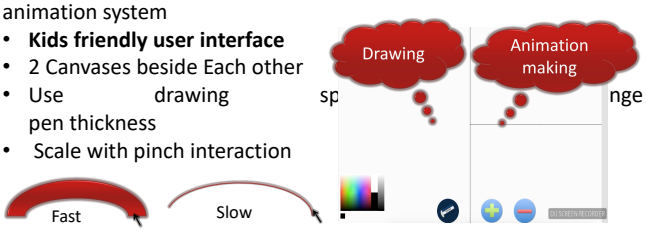
Both ways take time and effort.

Our goal. **H**elp preschoolers to animate their hand drawing with easy and less operation, to improve their language and communication skills

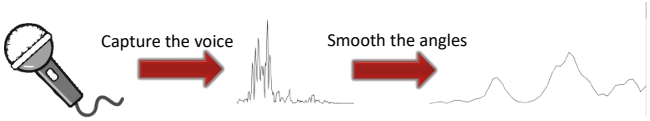
Proposed Method

We combine path following technique [Shiffmen, 2012] with the 2D animation system

- **Kids friendly user interface**
- 2 Canvases beside Each other
- Use drawing pen thickness sp nge
- Scale with pinch interaction



- **Sound waveform a path**



- **Crowd simulation**
  - Add and delete the character during the animation without key frame
  - Each character will has its own speed and way in following the path

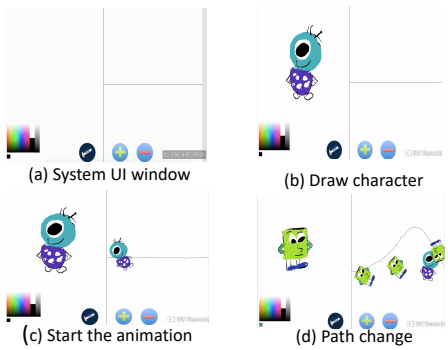


Figure 1: System overview. (a) System UI window. (b) Draw character in the drawing canvas. (c) Press + button to start the animation and increase characters. (d) adding more characters with + button & The shape of the path will changed according to user's sound tone

Conclusion

- We made an interactive system to help preschoolers keeping their creative thinking, by animate their hand drawing.
- Comparison result shows that our system was able to make animation with less effort and time than existing system
- User experience approved that our system good for kids in early ages

Compare our system with Autodesk Sketchbook Motion

System made to help novice user and children in making animation by using hand drawn images.

Comparison protocol: animate multiple characters in both systems, then compare the operations (Table1)

Table 1: Comparison between our system and Sketch Book Motion

	Our system	Sketch Book Motion
Path	One to many	One to one
Adding character	During the animation	Make new key frame
Character's move	Each character has unique movement	Individual Adjustment is required

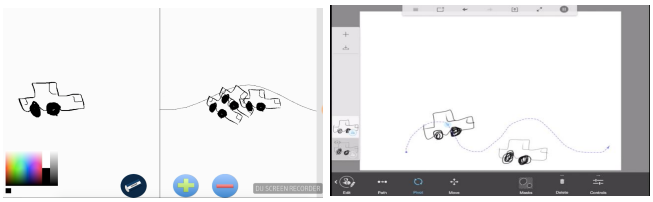


Figure 2: Comparison of the path and characters' move

User experience

Study protocol .8 K3 kids
.Galaxy tab A, use their fingers to interact
.Draw freely and Talk about it

Result. Kids enjoy using the system very fast, and according to home room teacher, she did not see the kids communicate and interact with each other like this in English before.

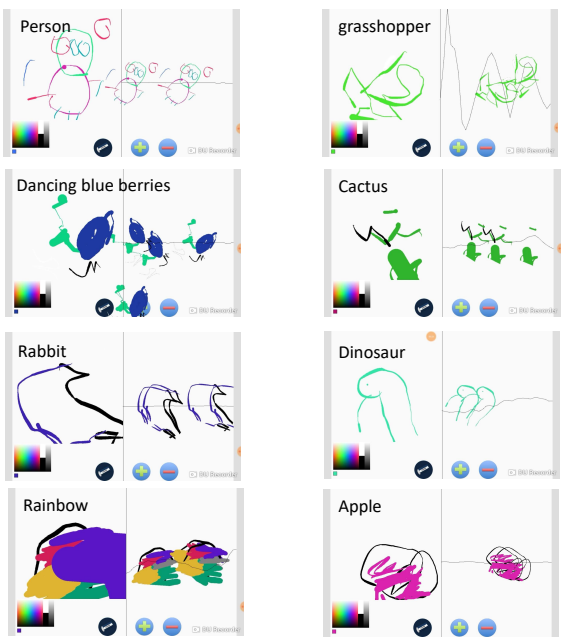


Figure 3: Some of kids work done during the user experience

Reference

1. Danial Shiffmen "The Nature of Code: Simulating Natural Systems with Processing", The Nature of Code, 2012.
2. Auto Desk, "SketchBook Motion", https://www.sketchbook.com/blog/motion-new-app-sketchbook-pro-members/.

2018 International Conference for ADADA + CUMULUS

Color Scheme and Material Simulation Method For Robot Character Design System

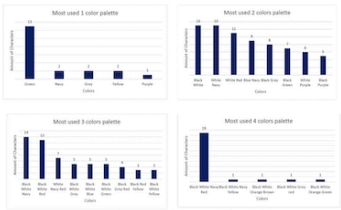
Pitchaporn Lertariyasakchai[1] Ryuta Motegi[2] Naoya Tsuruta[3] Kondo Kunio[3]
[1] King Mongkut's University of Technology Thonburi [2] Tokyo Metropolitan University [3] Tokyo University of Technology

Introduction

Since 1963 there is an animation which create characters in form of robot such as Astro boy, Mobile suit gundam and Code geass. In these animation, director, producer and designer have to conclude about parts of the character which also contain color and material of the character.[1] But there are many materials and tones or palettes of color so we have extended the previous robot simulation system in color and material parts. This will help user to explain each character appearance easier and sometimes support demanding of the customers such as for animation goods.

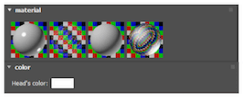
Analysis

1. Collected the information about robot's color from 32 titles of animation 285 characters and concluded them into graph



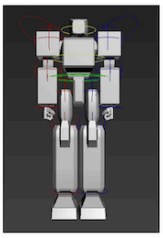
2. Create color palettes from graphs

3. Create color picker and material for each part



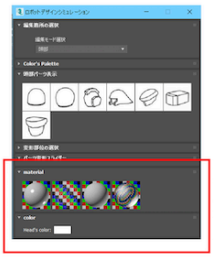
System Overview

robot's appearance preview



Select the color and material by the Palette

Select a mode for materials and colors in each part



if you clicked a color button in each part this color picker will come out

System Evaluation

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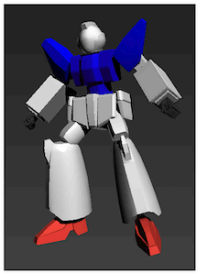
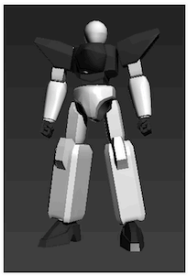


©SOTSU・SUNRISE・CODE GEASS



We compare the color of robot from our simulation and the one from an animation. They look similarly to the sample but do not have a detail of joints.

Conclusions

As the result, this simulation give user the easier way to explain with the designer how does the character will be like but only the approximately way. Also user can create many choices for their character that which one suit the character the most.

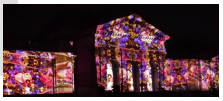
Reference

[1]Ryuta Motegi, Shota Tsuji, Yoshihisa Kanematsu, Koji Mikami, Kunio Kondo, "ROBOT CHARACTER DESIGN SIMULATION SYSTEM USING 3D PARTS MODELS", International Journal of Asia Digital Art and Design Association, 21(2), pp.81-86, 2017.

Learning Effect of Fore-Aft Perception of Familiar and Unfamiliar Sounds

Haruka Yajima , Keiko Ochi , Yasunari Obuchi
Tokyo University of Technology

INTRODUCTION



- A trend to attach great importance to an experience.
- Few practical examples of reality auditory perception (Ex. Mori et al. 2016)

- About auditory perception of reality
  - Use the surround sound
  - With the visual information

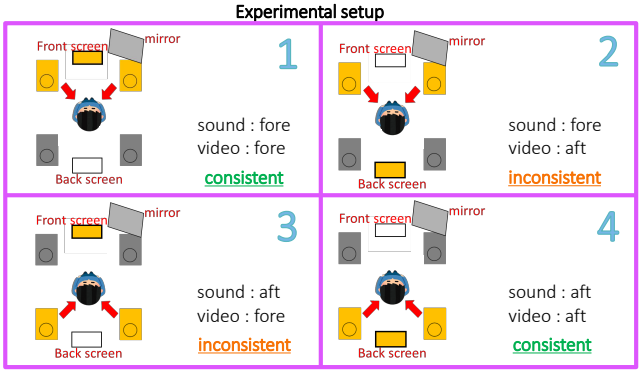
PURPOSE

- Difficulty of fore-aft perception
- Fore-aft perception of the sound
  - -> Learning effect
  - -> Influence of visual perception for the learning effect
  - -> Familiar and unfamiliar sounds

Questions

1. Fore-aft perception easier with both visual and auditory stimulation?
2. Fore-aft perception affected by the learning process with the video presentation?
3. Fore-aft perception easier with the familiar sound?

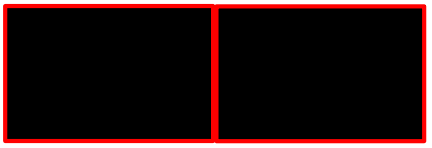
Experimental setup



Unfamiliar

the bleep

- Sound effect
  (A button was pushed)
- Orange circle flash on/off

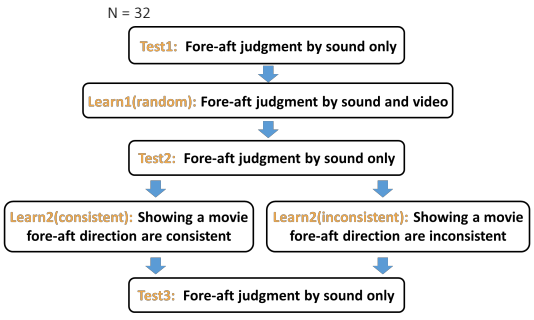


familiar

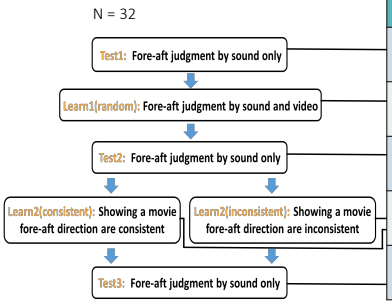
the voice

- "Konnichiwa(= hello)"
- Speaking

Flowchart of the experiment



Flowchart of the experiment



sound	video	judgment	Consistency
✔		✔	–
✔	✔	✔	random
✔		✔	–
✔	✔		Yes / No
✔		✔	–

RESULTS

Error rate of the experiments with bleep (%)

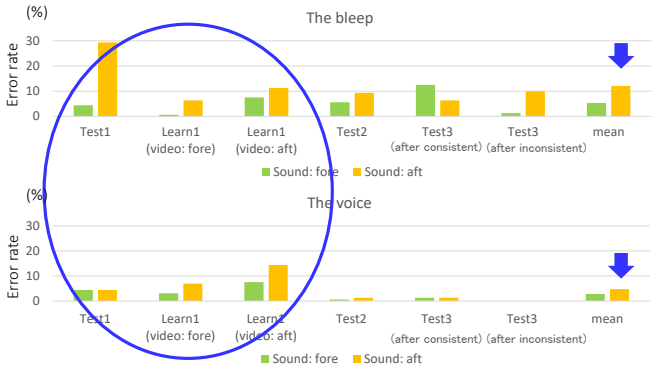
	Sound: fore	Sound: aft	mean
Test1	4.4	29.4	16.9
Learn1(video: fore)	0.6	6.3	3.4
Learn1(video: aft)	7.5	11.3	9.4
Test2	5.6	9.4	7.5
Test3 (after consistent)	12.5	6.3	9.4
Test3(after inconsistent)	1.3	10.0	5.6
mean	5.3	12.1	

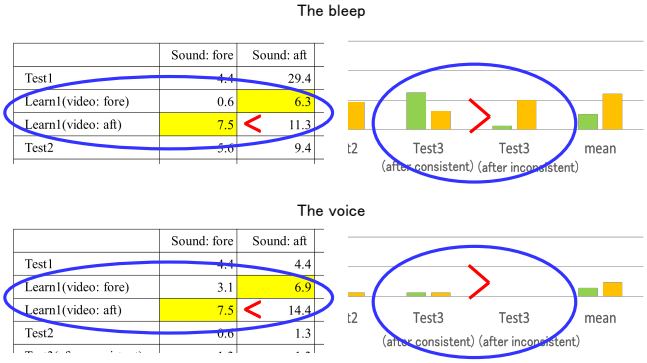
- Sound: aft -> more errors
- Step Test1 -> more errors

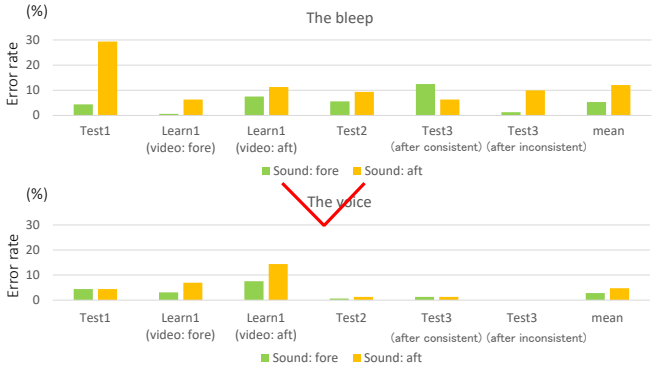
Error rate of the experiments with voice (%)

	Sound: fore	Sound: aft	mean
Test1	4.4	4.4	4.4
Learn1(video: fore)	3.1	6.9	5.0
Learn1(video: aft)	7.5	14.4	10.9
Test2	0.6	1.3	0.9
Test3(after consistent)	1.3	1.3	1.3
Test3(after inconsistent)	0.0	0.0	0.0
mean	2.8	4.7	

- Sound: aft -> more errors
- Step Test2 and after -> very few errors







CONCLUSIONS

Experiments

- Familiar sound is easier to judge the fore-aft
- Step Test1,Learn1 errors more than step Test2,Test3 error
- Small difference between consistent and inconsistent stimulations.

Conclusions

- ✓ Influence by learning effect by the environment and the sound itself
- △ Influence by learning effect with the visual information

Future works

- Use more sounds and videos
- Clarify the nature of fore-aft perception

Training Data Clustering for Key-Sound Estimation in Rhythm Action Games

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† Graduate School of Bionics, Computer and Media Science, Tokyo University of Technology.
‡ School of Media Science, Tokyo University of Technology.

Rhythm Action Games

- Player operates according to rhythm of the music
  - ex. beatmania, Dance Dance Revolution, Guitar Hero
- **Chart** is the visual symbols
  - The note presented to the player
  - Contains all the game information

Sound by player's operation

- **Tap-sound**
  - Effect sounds unrelated to the music
- **Key-sound**
  - Segmented sounds in the music
  - Key-sounds have higher interactivity

Sound by player's operation

- **Tap-sound**
  - Effect sounds unrelated to the music
- **Key-sound**
  - Segmented sounds in the music
  - Key-sounds have higher interactivity

Steps to create charts

- ① Extract segmented sounds from music
  - There are already production support tools
- ② Classify all sounds into key-sound or BGM
  - BGM : Sounds played regardless of operation
- ③ Place key-sounds appropriately on the chart

Related work

	Kagawa et al. (2015)	Donahue et al. (2017)	Lin et al. (2019)	This work
Input data	**MIDI**	Waveform	Waveform	Waveform
With key-sound	Yes	**None**	Yes	Yes
Acoustic feature	**None**	Yes	**None** (Filename only)	Yes

Dataset and Methods

- Use **Be-Music Source file (BMS)** dataset
  - Freeware rhythm action game data
  - Consists of 85 music pieces and 399 charts
  - Each music has many sound files and several chart files
- Classify key-sound by Support Vector Machine (SVM)
  - Optimize with Sequential Minimal Optimization (SMO)

Feature extraction

- Acoustic features
  - Extract from sound files
- Time-series information
  - Extract from a chart file

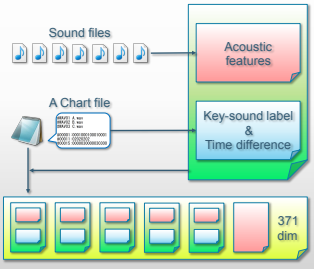
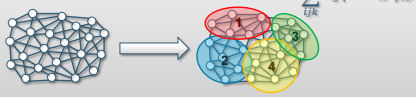


Chart clustering

- Classify the chart's individuality by the chart creator
  - Similarity is the mean of chart pair estimation accuracy
- Solve minimum cut problem → $x_{ik} = \begin{cases} 1 & (s_i \in c_k) \\ 0 & (else) \end{cases}$
  - Cost function to minimize based on similarity → $C = \sum_{ijk} G_{ij}(1 - x_{ik}x_{jk})$

○ A chart
– Similarity of charts
$G_{ij} = \frac{A_{ij} + A_{ji}}{2}$

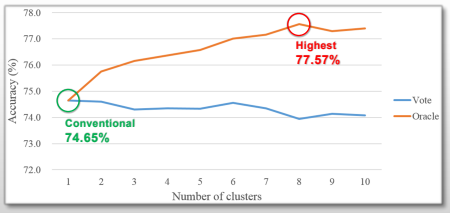


Experimental Configuration

- The number of clusters to divide is 1 to 10
  - The models are created for each cluster
  - 1 cluster can be interpreted as the baseline
  - Charts belong to same music piece are not in training data
- Define two evaluation criteria
  - **Oracle** : The model with the highest accuracy
  - **Vote** : The model with the highest confidence by SVM

Result

- Key-sound and BGM classification



Discussion

- Each models reflect the individuality of the creator
  - Suggested effectiveness of clustering
- To consider of optimal cluster selection is necessary
  - The best chart for a music piece is not unique
  - User evaluation is also required

Future work

- Improvement of algorithm and feature selection
  - Application of deep learning model
- Realization of auto-generate a chart
  - Perform user evaluation of auto-generated charts

Procedural Animation of Lava Lake

東京工科大学大学院 バイオ・情報メディア研究科 メディアサイエンス専攻

シティマニ　ナパトン / NAPATRON SITIMANEE　菊池　司 / Tsukasa Kikuchi

Abstract

In this research, we present about the Procedure Animation of Lava Lake and Eruption .Lava Pool was created by the eruption of volcano. During the eruption, all area will become the restricted area because of the effect from the weather and surrounding environment, For this simulation, we will consider the change of color, viscosity and physical fluid CG will be the tools to solve this problem. Moreover, CG can be used in other things, such as Movie, Game and Entertainment, even Geology's research, which are very useful and beneficial.

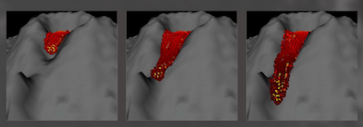
What is The Eruption?

Volcanoes erupt when molten rock called magma rises to the surface.
The Magma is so thick that gas bubbles can not easily escape,
and there are Pressure created.
Then Pressure and magma are compress and explode.

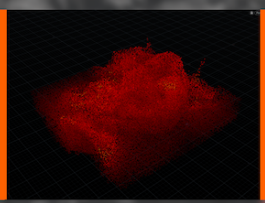
Look into inside of the Earth, the Magma chamber is the way that the Lava can push itself to the surface while erupting from the Volcano.In the eruption, not only the Lava that came out from the Volcano, but there are Ash, Gas, and others.

Research Work

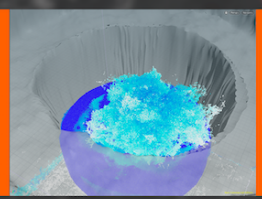
Stora's Animating lava flowing down the slopes of a volcano.The methods described rely on smoothed particles governed by a state equation for animating the flow We adapt this model to the animation of lava by linking viscosity to a temperature field and by simulating heat transfers.In the context of searching for visual realism, we also addressed the problem of rendering lava. Our solution, designed for a specific type of basaltic lava flow, consists of rendering a moving texture controlled by the flow and generated on the fly on an implicit surface that surrounds the particles. The texture combines color and displacement information.



Research Process I : Lava Lake

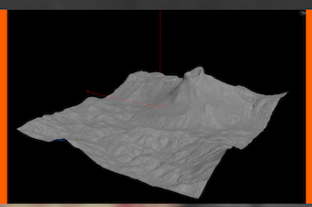


- Lava fluid simulation is performed by using the FLIP method and controlling temperature and viscosity
- For creating viscosity of dissolved gas, we use the movement of the particle to simulate ther dissolved gas bubbles.
- On this stage, we set the simulation frame rate at 240 fps.



- After we can simulate the viscosity from gas, we build the crater for simulating the active Lava Lake inside the volcano. On this process, we shape the crater to fit the Lava Lake itself.

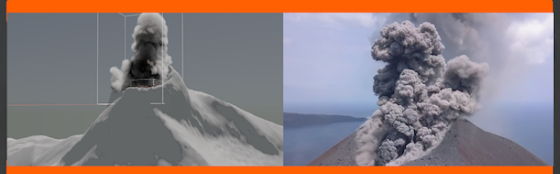
Research Process II : Eruption



For eruption, we have to study about stages of eruption to understand the process of the eruption. Therefore, we build the volcano to simulate the eruption.

After we study about the stages of the eruption, we will able to understand what we want to focus on the simulation. First is the smoke from the caster, and the second is the ash and dust that come out with the smoke.

COMPARISON



Referrent

[1] Dan Stora, Pierre-Olivier Agliati, Fabrice Neyret, Jean-Dominique Gascuel,"Animating Lava Flows", Graphic Interface(GI`99), pp. 203-210, 1999

[2] 田中 健大, 古屋 匠, 菊池 司, "FLIP と 1/f ノイズによる水中砂塵のプロシージャルア ニメーション", 芸術科学会論文誌, Vol. 15, No. 2, pp. 55-65, 2016

Procedural Modeling of Castle Town Considering Town Feature from Parcel Image

Takumi Fujitsuka Tsukasa Kikuchi

Tokyo University of Technology Graduate School

Abstract

In computer graphics (CG), there is a technology called “Procedural Modeling” which is referred to a mathematical algorithm that generates objects such as buildings, land environments and plants from predesigned algorithms. Unlike general modeling, Procedural Modeling does not create an object from begin by physical, but creates an object by mathematical algorithm.

Procedural animation can be generated automatically by using the parameters if there is no any error. It will perform smoothly if there is no error. However, Procedural Modeling want require a high ability, so it has a very difficulty to complete.
In this study, we are design "procedural modeling of castle towns considering the feature of town from parcel image". "Castle town" is a city centered on the castle of Daimyo in the "Sengoku period-Edo period" in the history of Japan. There are towns where "Samurai" and "Merchant" live, and there are not only castle defense facilities, but also economic development, which is not seen in other countries. It has a city structure.

We use the "Mapbox" image and consider application to Procedural Modeling. Based on the color information from the section image, the corresponding object is automatically generated, and the whole castle town is generated.

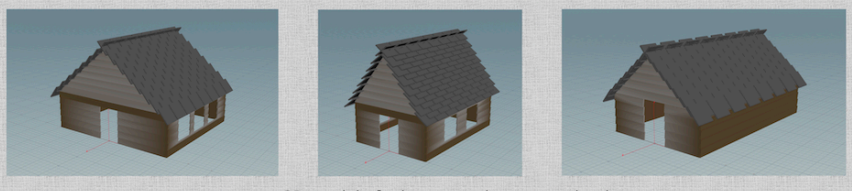
Fig.1. Aerial view of castle town

Fig.2. Castle town street

Research Object

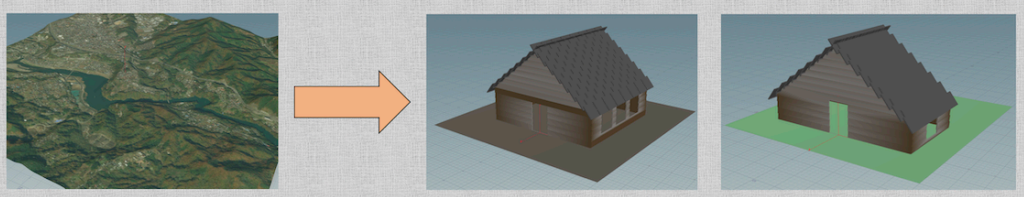
The purpose of the design in this research is the smooth automatic generation of "Castle Town". There are "Esri City Engine" and "Openbuildings Designer" etc., which are automatically generated software of city, but these correspond to the modern city. Although limited, there is no software that automatically generates castle towns in Japan, so "newness" is considered to exist from the viewpoint of existing software as well as research. Moreover, the merit of the automatic generation of the castle town by this design is the drastic reduction of modeling work time by Procedural Modeling. By reducing the burden of CG production, the burden on the creator is reduced, the work can be done smoothly, and the aim is to contribute to the development of the work.

Progress



3D model of a house made to procedural

Future Tasks



Terrain data by Mapbox

Object change due to terrain color information

Fig.1. Aerial view of castle town : https://colocal.jp/topics/lifestyle/renovation/20160108_61251.html
Fig.2. Castle town street : https://matcha-jp.com/jp/1720

火災旋風のプロシージャルアニメーション
Procedural Animation of Fire Tornado

東京工科大学 大学院
バイオ・情報メディア研究科 メディアサイエンス専攻
韋 程博/Wei Chengbo
東京工科大学 メディア学部 教授
菊池 司/Tsukasa Kikuchi

ABSTRACT

In this research, based on the Navier-Stokes equation, fire tornado whose detail of the generation process has not yet been clarified by the lattice method is reproduced in the form of procedural animation. We propose a method to add perlin noise as an external force term of the Navier-Stokes equation in the reproduction.

FIER TORNADO MECHANISM

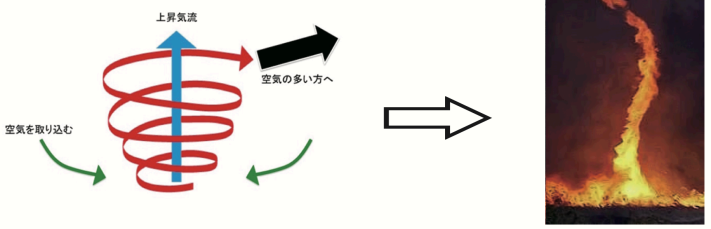
Fire generation by combustion

⇩

Formation of updraft generated by surface heat

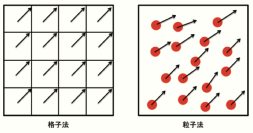
⇩

intense gusts



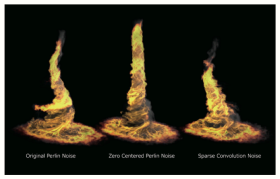
SIMULATION

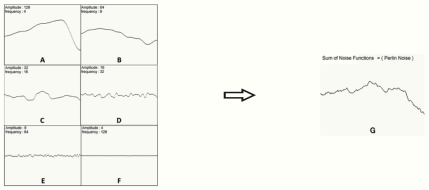
In this study, a whirlwind was created by separating particles from the ground and particles that burned with a rising gas stream and synthesizing them. In the simulation of particle fluids of flame and smoke, we use the Navier-Stokes equation to calculate and control the smoke and flame by the displacement method of grid method and particle method.



NOISE

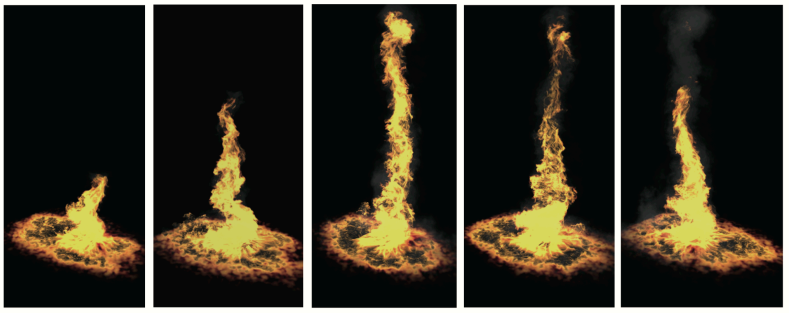
In the Parlin noise, the noise wave G is completed by adding the noise waves B to F, which are created in order by setting the initial noise wave as A and multiplying it by the frequency of 1/2 power and the ampli





RESULTS AND FUTURE WORK

As future problems, in consideration of the oxygen concentration distribution in the air, we will improve by adding the traveling direction and direction of the fire swirl.



Swimming simulation of jellyfish using PBD

Tokyo University of Technology Media Department

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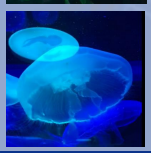
Introduction

Recently, in the expression of mollusks, simulations are used in various fields to express many objects such as fire, water, glass, iron and other substances. Along with that, the hardness of the object, the fluid, the texture such as the weathering of the geology are also expressed. Along with that, many phenomena such as material hardness, fluid, weathering of geology, etc. are expressed. When expressing high quality textures in detail, the computational load in simulation is heavy and computational time is required. In particular, since it takes a lot of load in soft-body representation, I thought whether there is a method that can be represented by a simulation with less load in soft-body representation. This time, we will use “Vellum”, a PBD-based cloth simulation technique installed in “Houdini” of 3DCG software. In this research, when expressing the movement of a mollusk, the simulation of the cloth with relatively low computational load is used to express the texture of the expression of the mollusk. The mollusks described in this study consider "Aurelia aurita", and if it is possible to express this texture, I think that it is possible to represent other mollusk simulations.

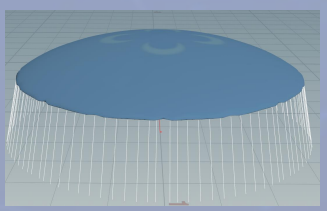


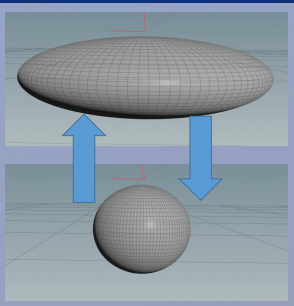
Knowledge of soft body and cloth simulation

In the representation of mollusks, originally, a dedicated method for simulation of soft bodies is used, and a spring-like elastic force is placed between various vertices of the object. Softness is expressed by pulling the tops of each other by the elastic force of the spring. On the other hand, in the simulation of cloth, the elastic force of the spring is applied only between the adjacent vertices, and the calculation load can be expressed less than in the simulation of the soft body.

Methods

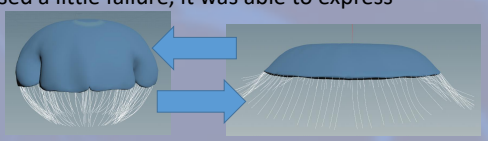
First, model the shape of the *Aurelia aurita* and apply cloth simulation to the jellyfish umbrella part. Then, in order to operate the swimming movement of the jellyfish, a core for contacting the cloth is set. The core sets movements for jellyfish swimming , deformation movements such as enlargement and contraction.





Results

When the simulation was actually carried out, although there was a form that caused a little failure, it was able to express movement similar to jellyfish.



Conclusions and Improvement point

In this simulation, the core is made and directly contacted with the cloth to express the movement of the jellyfish, but the jellyfish induces the water pressure by swimming movement. In the future, we will simulate a fluid close to reality and express the movement of the jellyfish and the movement of the fluid when actually performing a swimming movement. Furthermore, the next goal is to express swimming movements of other types of jellyfish.

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http://blog.mmacklin.com/publications/

MESH SIMPLIFICATION USING HYBRID SALIENCY

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東京工科大学
Tokyo University of Technology

Introduction

➢ *Hybrid Saliency*

- A type of attention degree, **sensitive to both color and geometric information**.
- A metric for **view-independent** mesh simplification.
- Determined by
  - **curvature**
  - **mesh saliency**
  - **the evaluation values of image saliencies** from multiple views.

➢ *Mesh Simplification*

	View-independent	Color Sensitive	Geometry Sensitive
Geometry Metric	Yes	No	Yes
Image Saliency Metric	No	Yes	No
Mesh Saliency Metric	Yes	No	Yes
Our Work	Yes	Yes	Yes

Method

Ⅰ Calculating Attributes for Each Vertex

- The **hybrid saliency** is view-independent and calculated based on the estimated curvature, the feature values of image saliency, and the mesh saliency of each vertex.
- **Curvature** and **mesh saliency** are view-independent, but **image saliency** is view-dependent. We can not use image saliency directly to calculate a view-independent value. So we use view-independent feature values of image saliency: **the minimum, maximum, and average image saliency** of multi-view image saliencies.

Ⅱ Classfication and Calculation of Temporary Hybrid Saliency Values for Vertices

- We take **curvature** and **mesh saliency** as global visual components.
- We take **the minimum, maximum and average image saliency** as local visual components.
- Because geometric information usually make more contribution to silhouette of a mesh, **the global visual components of mesh are considered more important than the local visual components in visual importance**.
- The vertices of the input mesh are classified as **types A, B, C, D, or E** according to the visual importance of each vertex. Then, a temporary hybrid-saliency value is assigned to each vertex as shown in the table below.

Ⅲ Numeric Conversion from Temporary Hybrid Saliency Values to Hybrid Saliency Values

- We perform a **numeric conversion** from a temporary hybrid-saliency value to a normalized hybrid-saliency value in different vertex types as shown in the table below.

Ⅳ Mesh Simplification with Hybrid Saliency

- The mesh is finally simplified by applying a sequence of **edge contraction operations**.
- The proposed method combines the quadric error metric [Garland et al. 1997] and the hybrid-saliency values to decide **the order of the operations**.

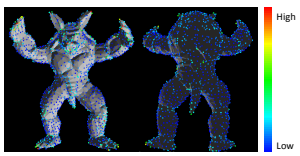
Vertex Type	Classification Criteria	Temporary Hybrid Saliency Value	Final Hybrid Saliency Value Range
Type A	Normalized **Curvature** > 0.1	Normalized curvature	0.9 ~ 1.0
Type B	Not Type A, and normalized **Mesh Saliency** > 0.66	Normalized **Mesh Saliency**	0.8 ~ 0.9
Type C	Not Type A or B, and normalized **Minimum Image Saliency** > 0.66	Normalized **Minimum Image Saliency**	0.7 ~ 0.8
Type D	Not Type A, B or C, and normalized **Maximum Image Saliency** < 0.33	Normalized **Maximum Image Saliency**	0.1 ~ 0.7
Type E	Neither of the above	Average value of normalized **Average Image Saliency** and normalized **Mesh Saliency**	0.0 ~ 0.1

Implementation Details

➢ Input a mesh model

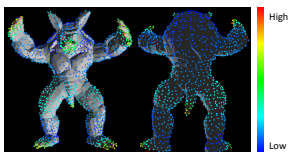
Input Mesh Model (front – 5000 polygons) | Input Mesh Model (back – 5000 polygons)

➢ Calculate Curvature [Taubin et al. 1995]



Curvature (front – 5000 polygons) | Curvature (back– 5000 polygons)

➢ Calculate Mesh Saliency [Lee et al. 2005]



Mesh Saliency (front – 5000 polygons) | Mesh Saliency (back– 5000 polygons)

➢ Calculate Image Saliency from Multiple Views [Itti et al. 1998]

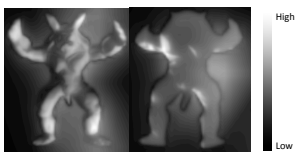
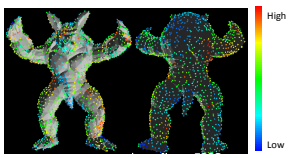


Image Saliency (front – 5000 polygons) | Image Saliency (back– 5000 polygons)

➢ Calculate Maximum Image Saliency

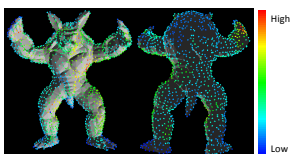


Maximum Image Saliency (front – 5000 polygons) | Maximum Image Saliency (back – 5000 polygons)

➢ Calculate Minimum Image Saliency

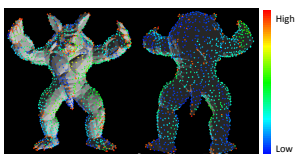
Minimum Image Saliency (front – 5000 polygons) | Minimum Image Saliency (back – 5000 polygons)

➢ Calculate Average Image Saliency



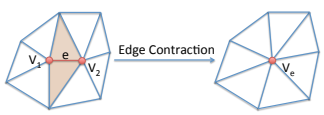
Average Image Saliency (front – 5000 polygons) | Average Image Saliency (back – 5000 polygons)

➢ Calculate Hybrid Saliency



Hybrid Saliency (front – 5000 polygons) | Hybrid Saliency (back – 5000 polygons)

➢ Simplify Input Mesh using Hybrid Saliency



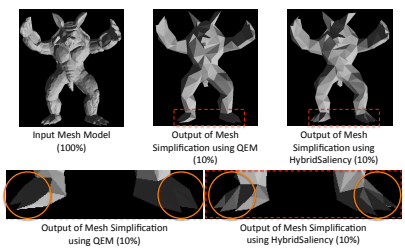
Mesh Simplification Operation
(Edge Contraction [Hoppe et al. 1993])

Input Model (front – 5000 polygons) | 20% Simplified Model (front – 4000 polygons) | 40% Simplified Model (front – 3000 polygons) | 60% Simplified Model (front – 2000 polygons)

Input Model (back– 5000 polygons) | 20% Simplified Model (back– 4000 polygons) | 40% Simplified Model (back– 3000 polygons) | 60% Simplified Model (back– 2000 polygons)

Result Comprisons

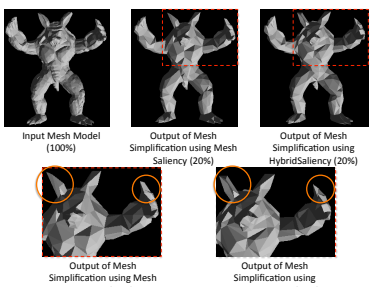
➢ Geometry Metric vs Hybrid Saliency



Input Mesh Model (100%) | Output of Mesh Simplification using QEM (10%) | Output of Mesh Simplification using HybridSaliency (10%)

Output of Mesh Simplification using QEM (10%) | Output of Mesh Simplification using HybridSaliency (10%)

➢ Mesh Saliency vs Hybrid Saliency



Input Mesh Model (100%) | Output of Mesh Simplification using Mesh Saliency (20%) | Output of Mesh Simplification using HybridSaliency (20%)

Output of Mesh Simplification using Mesh Saliency (20%) | Output of Mesh Simplification using HybridSaliency (20%)

References

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[6] H. Hoppe et al. Mesh optimization. Proc. SIGGRAPH 1993, pp. 19-26.

Conclusion

- Our work has **presented a view-independent mesh simplification method** using hybrid saliency which **takes both color and geometric information into account**.
- The proposed technique can **simplify the mesh by dropping the low-saliency parts while protecting the high-saliency parts**.
- For similar number of polygons, our work tends to **produce a better result** than other existing methods in terms of high-attention parts in the output meshes.

Making of Animation Scene using Perspective Exaggeration method in VRCG

Navaroot Prirungruang[1] Kunio Kondo[2]

[1]King Mongkut's University of Technology Thonburi [2] Tokyo University of Technology

INTRODUCTION

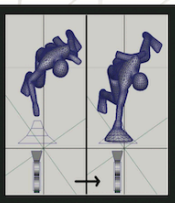
Many scenes in the anime have many movement. In some scenes, there may be some parts that are exaggerated to be able to understand the emotions of the characters in that action. It has been used in the field of 3DCG, changing the size or deformation of the mesh due to the device. By making the part of the character's body make the shape unusually.[1]

Which from the examination of those exaggerated performances cannot occur in the form of VRCG Because the character has a size that is inconsistent with reality That is a problem to make VRCG.[1]

**In this research I want to present another motion scene that has an exaggerated presentation. Make 3D out in the viewpoint of VR, where the scene is taken as an RPG shooting scene. In the anime name "Mitsuboshi Colors"*

[1] Katsushi Abe, Kunio Kondo, Naoya Tsuruta, "A study of perspective exaggeration in VRCG animation", Research report (2018)Page 1-2

Suzumiya Haruhi, Kadokawa shoten, Bandai Entertainment, Funimation



"A study of perspective exaggeration in VRCG animation", Research report (2018) Picture 2-2

Eren & Giant Titan from Attack on Titan game
https://gematsu.com/2015/08/attack-titan-game-omega-force-announced-ps4-ps3-ps-vita

METHOD

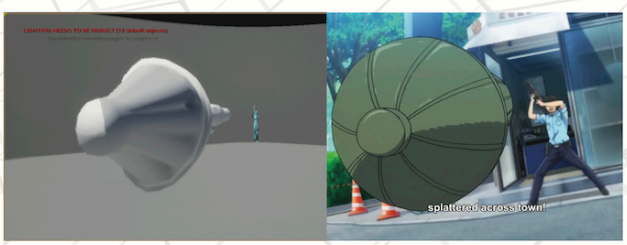
AUTODESK MAYA
- 3D Modeling
- Animate Movement

UNREAL ENGINE 4
- Set Position
- Set Camera
- Set Animation

(Using the Abe's System)

Window Mixed Reality
- View in VR mode

EXPERIMENT & EVALUATION



"You need to explode" - Mitsuboshi Colors
https://www.youtube.com/watch?v=KxQ0LoEwQGQ

The scene created by the 3D modeling and simulated look like an anime scene, in the VR view feel like picture on the right . But difference is part of character details in 3D model with the character in anime

CONCLUSION

The result is that from the example motion scene that has been created, we see the perspective exaggeration in VRCG of anime scene in many ways.

You can use Abe's System to be able to see the scene of the character movements in the VR view that exaggerated look similarity with the anime.

REFERENCE

Kunio Kondo, Naoya Tsuruta, Katsushi Abe, "A study of perspective exggeration in VRCG animation", Reseach report (2018)

Making of Animation Scene using Perspective Exaggeration method in VRCG

Sawaros Thongkaew[1] Kunio Kondo[2]
[1]King Mongkut's University of Technology Thonburi [2]Tokyo University of Technology

Introduction

In manga or anime actually have exaggerated perspectives scenes such as action scenes, robot scenes or mood scenes that makes more emotional. It's important technique.

from the examples of VR animation works, exaggerated views can't be explained. Because of unrealistic movements. It is impossible to solving problems by switch the scenes. Like in anime and manga.

Objective is to offer the real-time view of VR and learn about character movements. With an exaggerated views that have more realistic.

Making animation and presenting through the VR view is interesting. Using this project to apply with animation scene and present in VR is what I want to do. To learning the character movement in a new gesture.

Tool

Using abe's system to create character animation. This system is produced by using Unreal Engine 4 (UE4), which is a game engine.

Method

Autodesk Maya

3D Character model
+
Animation / Movement

Unreal Engine 4

Positioning
+
Animation setting
+
Camera setting

Viewing in VR space

Experiments & Evaluation

After finished making animation. Taking a screenshot of VR animation to compare with original scene. There's showing the similarity view. Difference is VR viewing feels like 1st person view.

Conclusion

From this example of VR animation. It show exaggerated perspective like the anime. You will see exaggerated perspective by real-time view of VR. It will help you to understand the character movements.

Moreover user can making other animation and use abe's system to see how exaggerated perspective was.

Reference : Kunio Kondo, Naoya Tsuruta, Katsushi Abe,
"A study of perspective exaggeration in VRCG animation", Research report (2018)

PROMOTING SUSTAINABLE VALUE CREATION FOR AGRICULTURE AND CONSUMERS : IMAGE UTILIZATION FOR AGRICULTURAL PLATFORM

Tokyo University of Technology　Media Science Program
G3118027 Yumiko Sonobe
Mizuho Iinuma

Background the research project

- The decrease of farmer population
- The aging of farmers advances
  (66.8 is the average of farmers in 2018)
- The fourth Industrial Revolution

Purpose of the research project

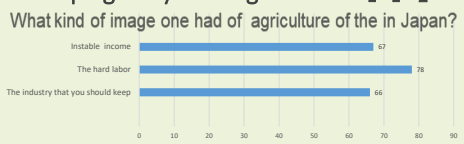
This study promotes communication of youth consumers and farmers and providing sustainable opportunity for interaction for those interested in Agriculture and farmers.
This study analyzes how the use of images on Social Networking Service (SNS) create new experienced value.

Previous research

【Sustainable Development Goals 2030 (SDGs)】
The Japanese Government to work on smart innovation [1]
The City of Iki, Nagasaki Prefecture is to adapt IoT and utilize AI.

Sustainable Development Goals

【 Youths keeping away from agriculture [2] 】



Survey of university students(n=130), attitude towards agriculture (2015)

- For a future choice of career, more than 60% of the respondents were not interested in agriculture.

Research Method

AGRICULTURE MARKETING USING DIGITAL MEDIA

Agriculture platform site "Chokubuy! " [3]

Chokubuy!

"Chokubuy!" supports farmers and direct sale places by allowing consumers to write review on the platform. Also, "Chokubuy!" attempts to create a real connection for farmers and consumers by visualizing each other`s existence. It is considered effective for creating sustainable farming and revitalizing agriculture in Japan to plan and build a community with active communication among farmers and consumers using the media technology such as SNS and websites.

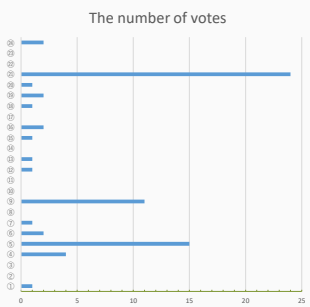
ANALYSIS

62 images placed in the Instagram that "Chokubuy!" ran by April 16, 2019 were analyzed. Information dispatch for consumers was mainly used. The follower was 1,114 people when the study took place. Main user is the farmers and housewife. The study classified 62 images into 24 images of farmers introductions, 14 images on news, 18 images on vegetables, seven images on food. By four category distinction, subjects assumed it two choice answer forms each.
The participants were 28 men and women in their twenties.
The question contents reply it with the number of a photograph worried about by intuition in the photograph of each category. When an image flowed on a timeline of SNS, this intention is to investigate an image left in the impression.

RESULT

Farmers introductions category

The images farmers introductions



Count result according to the farmers introductions

The images from Instagram that run to Chokubuy! were classified in four categories. They show below the result that had a subject vote.
24 images classified in the farmers introduction. There were many polls of three following images in that. In ㉑ was 24 votes, in ⑤ was 15 votes, ⑨ was 11 votes. The angle of view of three images does not have the common point. ⑤ and ⑨ are characterized by the vividness of the image. On the other hand, as for ㉑ image, a target person is felt by a knee shot in comparison with other images distantly. And luminosity is high through the whole image.

DISCUSSION

It is thought that the impact of a color and the angle of view is stronger in ⑤ and ⑨ than ㉑. On the other hand, luminosity is higher in ⑤ and ⑨ and lets you feel pleasant. It is thought that this is a conventional taste against "a quality of farmers".
So, plainness and beauty of the subject become important to keep the eyes of the youth with the first impression.

Conclusion

If the images chosen to share on SNS meet the such criteria, SNS can be considered as effective trigger for youths to show interest. However, in order to show such images on SNS, agriculture in Japan must also change their negative impressions. In other words, we can create shared value by using SNS not only for the promotion of farmers and products but also for sustainable agriculture with right uses of images introduced.

Reference

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[3] Chokubuy, https://choku-buy.com/ (2019).

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SCHOOL OF MEDIA SCIENCE
TOKYO UNIVERSITY OF TECHNOLOGY

Program and Abstracts

4TH JOINT SYMPOSIUM OF KMUTT AND TUT

July 5, 2019

Tokyo University of Technology, Hachioji Campus

Hachioji, Tokyo, Japan