

PROCEEDINGS

DTAS-2023

**4th International Symposium
on Development of new Technologies
Engineering & Applied Science
Research**

Venue: Hotel Mystays Ochanomizu Conference Center

Tokyo, Japan

Date: June 17-18, 2023



CONFERENCE BOOK OF ABSTRACT PROCEEDINGS

Consortium-ET

Consortium of Engineering & Technology



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Book of Abstracts Proceedings

4th International Symposium on Development of new Technologies in Engineering & Applied Science Research

Tokyo, Japan
June 17-18, 2023

Email: info@consortium-et.com

URL: www.consortium-et.com



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Proceedings of the 4th International Symposium on Development of new Technologies in Engineering & Applied Science Research (IEAS)

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***4th International Symposium on Development of new
Technologies in Engineering & Applied Science Research
(DTAS)***

Venue: Hotel Mystays Ochanomizu Conference Center Tokyo, Japan

Conference Theme: An effective platform to meet other renowned experts in the filed of engineering and technology.



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CONFERENCE TRACKS

- Computer and Software Engineering
- Mechanical & Metallurgical Engineering
- Electrical & Electronics Engineering
- Civil Engineering
- Bio-Technology & Food Technology
- Chemistry & Chemical Engineering
- Physical, Applied and Life Sciences
- Interdisciplinary

CONFERENCE CHAIR MESSAGE

Michael Sasaoka

“International Conference of Consortium of Engineering & Technology” is a platform that thrives to support the worldwide scholarly community to analyze the role played by the multidisciplinary innovations for the betterment of human societies. It also encourages academicians, practitioners, scientists, and scholars from various disciplines to come together and share their ideas about how they can make all the disciplines interact in an innovative way and to sort out the way to minimize the effect of challenges faced by the society. All the research work presented in this conference is truly exceptional, promising, and effective. These researches are designed to target the challenges that are faced by various sub-domains of the social sciences and applied sciences.

I would like to thank our honorable scientific and review committee for giving their precious time to the review process covering the papers presented in this conference. I am also highly obliged to the participants for being a part of our efforts to promote knowledge sharing and learning. We as scholars make an integral part of the leading educated class of the society that is responsible for benefitting the society with their knowledge. Let’s get over all sorts of discrimination and take a look at the wider picture. Let’s work together for the welfare of humanity for making the world a harmonious place to live and making it flourish in every aspect. Stay blessed.

Thank you.

Michael Sasaoka

Conference Chair

Email: contact@consortium-et.com



CONFERENCE AGENDA

DATE: June 17-18, 2023

LOCATION: Hotel Mystays Ochanomizu Conference Center

DAY: Saturday-Sunday

EVENT TITLE: 4th International Symposium on Development of new Technologies in Engineering
& Applied Science Research DTAS-2023

Start Time

09:00 am - 09:30 am: Registration & Kit Distribution
09:30 am - 09:40 am: Opening Speech - Mr. Ariel
09:40 am - 09:50 am: Introduction of Participants
09:50 am - 10:00 am: Group Photo & Award Ceremony



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EVENT TITLE: 4th International Symposium on Development of new Technologies in Engineering
& Applied Science Research DTAS-2023

Session: 01
10:00 am 12:30 pm: Presentation Session

Track A: Engineering, Technology and Computer Sciences

Presenter Name	Manuscript Title	Paper ID
TOK-3623-101E	Effects of Eddy Diffusivity in Phase Change Heat Transfer on A Horizontal Cylinder With Variable Surface Temperature	HAI-PING HU
DTAS-JUNE23-101 & DTAS-JUNE23-101C	Improved mechanical properties and cycling performance of silicon anode bio-based 3D network binder for lithium-ion batteries.	Nam Kyu Lim & Woo-Jin Song
DTAS-JUNE23-102	High-Wettability and Thermally Stable Nano-Rod Hydroxyapatite Ceramic Coated Separators for Progressive Lithium-Ion Batteries	Su-Jong Bae
DTAS-JUNE23-103	The robust cross-linked binder based on poly (acrylic acid) with tannic acid for silicon anode of lithium storage system	Mincheol Jung
DTAS-JUNE23-105	Research on aiming sensitivity of a joystick designed for side-scrolling shooter games	Shih-Chieh Liao
DTAS-JUNE23-106	Key factors of Viewers Visual Perceptions Towards Female Vtuber and Relevant Characteristics Study	Shih-Chieh Liao
DTAS-JUNE23-107	The Impact of Player Types on the Results of Cooperative Games	Shih-Chieh Liao

Lunch Break & Closing Ceremony (12:30 pm 02:00 pm)

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Conference Day 02 (June 18,2023)

Second day of conference will be specified for touristy. Relevant expenses are borne by Individual him/herself.



*4th International Symposium on
Development of new Technologies in Engineering & Applied Science Research (DTAS) Tokyo, Japan*

TRACK A

Engineering, Technology and Computer Sciences

Improved mechanical properties and cycling performance of silicon anode bio-based 3D network binder for lithium-ion batteries.

^{1*}Nam Kyu Lim, ²Woo-Jin Song

^{1,2}Chungnam National University, Daejeon 34134, Republic of Korea.

Keywords: Li-ion battery, Silicon anode, Sodium Alginate, Citric acid, 3D Network Binder

With the growth of electric vehicles and energy storage systems (EES), the demand for lithium-ion batteries requiring high energy density is increasing day by day. Currently, commercially available graphite anodes have a theoretical capacity of 372 mAh g⁻¹ and are unable to meet this high energy density. Silicon (Si) has attracted much attention as a next-generation anode material with a high theoretical capacity of 4200 mAh g⁻¹. However, Si suffers from problems such as pulverization due to its large volume expansion of more than 300% during charge and discharge, which leads to the formation of a thick solid electrolyte interface (SEI) layer and degradation of electrochemical performance. Therefore, we tried to suppress the above issues by applying a 3D network binder using sodium alginate (SA) and citric acid (CA) to the silicon anode. As a result, it shows a capacity retention of 95.23% after 100 cycles at 0.5C, which is better than other linear binders. This good performance is a result of the better adhesion with the 3D network binder and the corresponding improvement in cycling performance.

High-Wettability and Thermally Stable Nano-Rod Hydroxyapatite Ceramic Coated Separators for Progressive Lithium-Ion Batteries

¹*Su-Jong Bae, ²Chi keung Song, ³Woo-Jin Song
^{1,2,3}Chungnam National University, Republic of Korea

Keywords: Nano rod hydroxyapatite, Ceramic-coated Separator, Lithium-ion battery

Lithium-ion batteries (LIBs) are widely used in various applications, but their safety issues remain a major challenge. In this study, we propose a novel ceramic-coated separator (CCS) based on rod-shaped hydroxyapatite (HA) ceramics, which can improve the thermal stability and electrochemical performance of LIBs. The HA ceramics were synthesized by a hydrothermal method and coated on a polyethylene (PE) separator by a bar-coating process, resulting in a uniform ceramic coating layer with a thickness of 6 μm. The morphology, structure, and properties of the CCS were characterized by scanning electron microscopy (SEM), X-ray diffraction (XRD), thermogravimetric analysis (TGA), differential scanning calorimetry (DSC), and electrochemical tests. The results showed that the CCS had a uniform and porous coating layer composed of rod-shaped HA particles with an average diameter of 200 nm and an average length of 3 μm. The CCS exhibited higher thermal stability, electrolyte affinity, ionic conductivity, and interfacial compatibility than the pristine PE separator. Moreover, the CCS effectively improved the cycling performance and rate capability of LIBs. The results suggest that rod-shaped HA ceramics have great potential as a ceramic coating separator for high-performance lithium-ion batteries.

The robust cross-linked binder based on poly(acrylic acid) with tannic acid for silicon anode of lithium storage system

^{1*}Mincheol Jung, ²Woo-Jin Song

^{1,2}Chungnam National University, Republic of Korea

Keywords: Poly(acrylic acid), Tannic acid, Network structure, Silicon anode, Li-ion battery

Silicon anode has been counted as the most promising anode material for next-generation due to the advantages of high theoretical capacity (4200 mAh g⁻¹) and its low charge/discharge potential. However, silicon particles undergo huge volume changes of about 400 and have low electrical conductivity, which causes poor electrical contact between conductive materials and silicon particles. To address these issues, a polymeric binder of silicon anode can be a significant role. In this study, tannic acid (TAc) and poly(acrylic acid) (PAA) can be formed a cross-linked network structure via hydrogen bonding between both materials. The obtained C-PAA/TAc binder (with various weight ratios of 5:5, 8:2, and 2:8 (PAA:TAc)) can restrain the enormous volume change during long-termed cycles. As a result, The C-PAA/TAc binder exhibits improved cycle stability and high Coulombic efficiency compared with well-established PAA binders. The C-PAA/TAc (5:5) has an excellent reversible capacity of 1833 mA h g⁻¹ which corresponded to almost 100% capacity retention after 100 cycles, which is higher than that of electrodes fabricated using the conventional PAA binder. This work provides an effective strategy for Li-ion batteries.

Research on Aiming Sensitivity of a Joystick Designed for Side-Scrolling Shooter Games

^{1*}Shih-Chieh Liao, ²Chian-Fan Liou, ³Cheng-Yan Shuai

^{1,2,3}Southern Taiwan University of Science and Technology Tainan Taiwan

Keywords: Joystick, 2DSTG, User interface, Aiming operation.

In early side-scrolling shooter games (2D STG) games, shooting was limited to 8 directions, posing a challenge for players as movement and shooting directions were the same. However, with recent updates in game controllers, the aiming feature has evolved from 8-directional to a 360-degree aiming system, increasing the variables that players need to control. This study hypothesizes that the sensitivity of controllers for different aiming functions may impact game performance and subsequently affect the gaming experience. To test this hypothesis, a specialized controller for 2D STG was developed, and 10 participants were recruited to participate in three experimental groups. The results revealed that completion time, ammunition consumption, and hit rate were lower in the 8-directional scale group compared to the 16-directional scale and non-graded directional scale groups. Thus, it is suggested that the aiming sensitivity provided by the 8-directional scale is more suitable for tasks involving movement and shooting when using a controller

Key factors of Viewers Visual Perceptions Towards Female Vtub and Relevant Characteristics Study

^{1*}Shih-Chieh Liao Liao,²Chian-Fan, Liou, ³Jen-Ying Ma

¹Southern Taiwan University of Science, Taiwan

Keywords: Vtuber, Character Design, EGM

The purpose of this research is to understand the effect of female Vtuber appearance doing to audience feeling. We collect 54 famous female Vtuber and assemble 5 deep audience for focus group to choose 17 Vtuber in our collection for representative sample. Then, getting Vtuber specific feature through the EGM(Evaluation Grid Method). In the result we got 4 appearance features : Overall appearance, Outfit design, Body parts, Theme setting. And 5 inner feeling : Cuteness, Comfort, Chicness, Sex, Love. At last aggregate out an EGM architecture association diagram consists of 3 phases: Abstract inner feeling(up phase), Vtuber key factors(middle phase), specific appearance features(down phase). We look forward to giving a scientific reference of creating attractive Vtuber design for industry or individual in the future.

The Impact of Player Types on the Results of Cooperative Games

¹Shih-Chieh Liao, ^{2*}Chian Fan, Liou, ³Rou Hua, Zeng

^{1,2,3}Southern Taiwan University of Science and Technology, Tainan, Taiwan

Keywords: Player Types, Cooperative Games, Collaboration

Cooperative games usually require players to communicate and collaborate to achieve common goals, providing challenging and social interaction experiences. Based on Bartle's game theory, game players can be classified into four types: Killer, Achiever, Socializer, and Explorer. This study aims to explore the impact of different game player types on cooperative games and further investigate whether different types of game players affect game experience and result differences in cooperative game matching. We recruited 46 players for the experiment and cross-matched different types of players to play "OVERCOOED2." Data was collected through questionnaire surveys. The results show that there is no significant difference in game results between different types of game players when matched to play cooperative games, indicating that player types do not affect game performance. However, there are significant differences in satisfaction between different types of player combinations. The research data shows that the combination of Achiever players and Achiever players has lower game satisfaction than other combinations and has higher expectations for game performance and self-expression. Based on the experimental results, this study provides suggestions for game designers and developers to better meet the needs of different player types.

EFFECTS OF EDDY DIFFUSIVITY IN PHASE CHANGE HEAT TRANSFER ON A HORIZONTAL CYLINDER WITH VARIABLE SURFACE TEMPERATURE

*HAI-PING HU

Department of Marine Engineering, National Taiwan Ocean University

Keywords: LN2, phase change, horizontal cylinder

The present theoretical study investigates the effects of eddy diffusivity in phase change heat transfer. It considers a horizontal cylinder immersed in a quiescent liquid with saturated temperature. The variable surface temperature is high enough to occur phase change of boiling heat transfer on the surface of the horizontal cylinder, and then a continuous vapor runs upward over the horizontal cylinder. The working fluid in the present study is cryogenic LN2. The non-linear absolute viscosity and thermal conductivity in the nitrogen vapor are all included in the present research. Besides, the modified Grashof number, temperature ratio and thermal radiation are also detailed discussed. The result shows the increase of the temperature ratio and thermal radiation will bring an increase in average heat transfer. Boiling heat transfer under the quiescent LN2 with saturated temperature, the modified Grashof number is one of the important parameters. Consequently, the larger the modified Grashof number is, the larger the heat transfer rate will be.

UP COMING EVENTS

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<http://consortium-et.com/upcoming-events/>



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To disseminate knowledge and help scholars, practitioners and administrators to promote the high quality research.

