

Region 10 Section Report – Gwangju Section

PART A - SECTION SUMMARY

A.1 Executive Summary – (Please follow the format given below)

- Section Executive Committee Member List

CHAIR	Minjae Lee	minjae@gist.ac.kr
SECRETARY	Sung-Min Hong	smhong@gist.ac.kr
TREASURER	Jong Won Shin	jwshin@gist.ac.kr
VICE CHAIR	Jong-In Song	jisong@gist.ac.kr
MEMBERSHIP DEVELOPMENT	Euseok Hwang	euseokh@gist.ac.kr
MEMBER-AT-LARGE	Kiseon Kim	kskim@gist.ac.kr
	Heung-No Lee	heungno@gist.ac.kr
	Myoung Jin Lee	mjlee@chonnam.ac.kr

- Section Highlights

In 2022, the IEEE Gwangju Section offered seven technical (6) and administrative (1) meetings. Most technical activities were given at the campus of GIST, Korea.

Moreover, there was one global workshop co-sponsored by the IEEE Gwangju Section. The lecturers came from United States, Japan, Hong King.

- Major Events (International, National)

Collaborative Workshop for Accelerating Intelligence: Semiconductor & AI, December 9, 2022: An international workshop, which was co-sponsored by the IEEE Gwangju Section.

- Major Chapter Activities

N/A

- Major Student and Affinity Group Activities

N/A

- Awards

N/A

A.2 Financial Report – (Please follow the format given below)

- Summary (as per submitted on NetSuite)

1			
2			
3	Geo Unit Income & Expense Details		
4	Project R00493-Gwangju Section - Gwangju Section		
5	Date Range From 01-01-2022 To 12-31-2022		
6	Report Date 02-25-2023		
7	Project Name	Gwangju Section	Total
8	Task Number	Amount	Amount
9	3.00 - 3 Other Recpt	\$3,172.08	\$3,172.08
10	3.10 - 10 Rebate from IEEE	\$2,842.95	\$2,842.95
11	3.10.000 - 000 Rebate from IEEE	\$2,842.95	\$2,842.95
12	3.40 - 40 IEEE CB Account Interest	\$73.23	\$73.23
13	3.40.000 - 000 IEEE CB Account Interest	\$73.23	\$73.23
14	3.70 - 70 Other Income	\$255.90	\$255.90
15	3.70.000 - 000 Other	\$255.90	\$255.90
16	3.99 Total Income:	\$3,172.08	\$3,172.08
17	4.00 - 4 Prog Exp	\$3,082.48	\$3,082.48
18	4.10 - 10 Meetings & Other	\$426.78	\$426.78
19	4.10.010 - 010 Section Meeting	\$426.78	\$426.78
20	4.70 - 70 Professional Activities & Other	\$1,958.10	\$1,958.10
21	4.70.000 - 000 Professional Activities	\$1,958.10	\$1,958.10
22	4.80 - 80 Student Activities & Other	\$697.60	\$697.60
23	4.80.040 - 040 Student Awards	\$697.60	\$697.60
24	5.00 - 5 Other Mgmt & Gen Exp	\$11.25	\$11.25
25	5.60 - 60 Management & Other Expenses	\$11.25	\$11.25
26	5.60.010 - 010 Bank & Credit-Card Fees	\$11.25	\$11.25
27	9.99 Total Expenses:	\$3,093.73	\$3,093.73
28	Net Income:	\$78.35	\$78.35

Balance as of Feb. 25, 2022 is 10,269.99 USD.

- Any other financial activities

N/A

PART B - ORGANIZATIONAL ACTIVITIES

B.1 Membership Development Activities

- Total number of active members in the past 3 years.

We have 274 members as of January 31, 2023. (MD Monthly Report)

As of November 30, 2021, we had 217 members. (Last Section Report)

- Summary and evidence of work done to improve the value of membership, which leads to retention and growth of members

We are very proud that the IEEE Gwangju Section offered an international workshop, “Collaborative Workshop for Accelerating Intelligence: Semiconductor & AI” in 2022. In addition to 6 technical seminars, the international workshop improves the value of the IEEE membership, especially for our young undergraduate/graduate students.

B.2 Chapter Activities

- Total number of Chapters in the Section

N/A

- Number of Chapters formed in the current year

N/A

- Number of active Chapters (Chapters who have reported required number of meetings during the year)

N/A

- Summary of Chapter activities (Chapter wise with attachment table/information)

N/A

B.3 Professional and Continuing Education Activities

In 2022, there have been 6 seminars and 1 global workshop (co-)supported by the IEEE Gwangju Section.

Number	Seminar
1	<p>September 30, 2022, IEEE Seminar</p> <ul style="list-style-type: none"> - Speaker: Prof. Youngki Kim, University of Michigan-Dearborn, United States - Topic: Smart Energy Management in Electric Vehicles - Attendees: 15 members and 20 non-members <p>Gwangju Section invited Prof. Youngki Kim from University of Michigan-Dearborn, United States. Professor Kim discussed Eco-driving which is arguably the hottest and fastest-growing research area in the engineering field due to ever-increasing concerns about the environment as well as energy sustainability.</p>
2	<p>October 14, 2022, IEEE Seminar</p> <ul style="list-style-type: none"> - Speaker: Prof. Yongjune Kim, POSTECH - Topic: Efficient Estimation of Min-entropy - Attendees: 10 members and 35 non-members <p>Gwangju Section invited Prof. Yongjune Kim from POSTECH. Professor Kim discussed min-entropy, which is a widely used metric to quantify the randomness of generated random numbers in cryptographic applications; it measures the difficulty of guessing the most likely output.</p>

3	<p>October 26, 2022, IEEE Seminar</p> <ul style="list-style-type: none"> - Speaker: Prof. Myung J. Lee, City University of New York, United States - Topic: Hardware Machine Learning-based Host Intrusion Detection System using Stochastic Computing - Attendees: 5 members and 10 non-members <p>Gwangju Section invited Prof. Myung J. Lee from City University of New York, United States. Professor Lee discussed the information technology evolution toward IoT in the view of entropy expansion with examples in communications.</p>
4	<p>November 18, 2022, IEEE Seminar</p> <ul style="list-style-type: none"> - Speaker: Tae-il Kim, Sungkyunkwan University (SKKU) - Topic: Unconventional Band Pass Filters for Bioelectronics - Attendees: 10 members and 20 non-members <p>Gwangju Section invited Prof. Tae-il Kim from Sungkyunkwan University. Professor Kim discussed several methods for band pass filtering for human physiological signals.</p>
5	<p>November 24, 2022, IEEE Seminar</p> <ul style="list-style-type: none"> - Speaker: Dr. Jung-jae Kim, Institute for Infocomm Research (I2R), ASTAR, Singapore - Topic: Knowledge-aware human request translation and multi-modal challenge participations - Attendees: 5 members and 10 non-members <p>Gwangju Section invited Dr. Jung-jae Kim from Institute for Infocomm Research (I2R), ASTAR, Singapore. Dr. Kim presented two kinds of works of the Semantic Text Analytics group at Institute for Infocomm Research.</p>
6	<p>December 2, 2022, IEEE Seminar</p> <ul style="list-style-type: none"> - Speaker: Dr. Hwanjun Song, AI Lab, Naver - Topic: Research trends in NAVER AI Lab: Data Robustness and Efficiency, Vision Transformers, and Continual Learning - Attendees: 10 members and 15 non-members <p>Gwangju Section invited Dr. Hwanjun Song from AI Lab, Naver. Dr. Song discussed Data and models are the two key factors in improving AI system.</p>
7	<p>December 9, 2022, IEEE Gwangju Co-sponsored Global Workshop</p>

	<ul style="list-style-type: none"> - Speaker: Prof. Jeehwan Kim (Massachusetts Institute of Technology), Prof. Joshua Yang (University of Southern California), Prof. Satofumi Souma (Kobe University), Prof. Yang Chai (The Hong Kong Polytechnic University), Prof. Cunjiang Yu (Penn State University), Dr. Anurag Arnab (Google), Dr. Mathilde Caron (Google) - Topic: Semiconductor and AI - Attendees: 50 members and 100 non-members - 2022 GIST EECS & AI Day Collaborative Workshop for Accelerating Intelligence Semiconductor & AI invited 7 distinguished speakers from US, China, Japan, and France, for discussing potential collaborations on semiconductor and AI areas.
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• **September 30, 2022, IEEE Seminar**

- Speaker: Prof. Youngki Kim, University of Michigan-Dearborn
- Topic: Smart Energy Management in Electric Vehicles
- Attendees: 15 members and 20 non-members

Gwangju Section invited Prof. Youngki Kim from University of Michigan-Dearborn. Professor Kim discussed Eco-driving which is arguably the hottest and fastest-growing research area in the engineering field due to ever-increasing concerns about the environment as well as energy sustainability.



IEEE Gwangju Section Seminar

Host: Hwang, Euseok / Language: English
Friday, September 30, 2022, 10:00~

Real-time lecture using Zoom

* <https://us06web.zoom.us/j/82416909590?pwd=N2JFYWVuL0J5YVpvOUlnQS80UWlwZz09>
(Meeting ID: 824 1690 9590 / PW: eecs2022)

Smart Energy Management in Electric Vehicles

Youngki Kim, Ph.D.

Assistant Professor
Mechanical Engineering Department
University of Michigan-Dearborn

[Abstract]

Eco-driving is arguably the hottest and fastest-growing research area in the engineering field due to ever-increasing concerns about the environment as well as energy sustainability. Particularly, the future traffic information constructed with various pieces of information via vehicle connectivity provides an opportunity for achieving the full potential benefits of automated electrified vehicles in terms of energy efficiency in addition to safety and ride comfort. In this talk, I will present two model predictive control (MPC)-based control approaches to eco-driving of plug-in electric vehicles: 1) centralized optimal control of powertrain and vehicle dynamics, and 2) heating, ventilation, and air-conditioning (HVAC) system control. First, I will present a control framework for solving a centralized optimal control problem while resolving the conflict between the prediction horizon length and the computation complexity with co-states approximating the future cost. Second, I will present an MPC-based HVAC control strategy with a newly proposed HVAC system model based on the assumption of a quasi-steady ideal vapor-compression cycle. Then, I will conclude the talk with concluding remarks about future research topics.

[Bio Sketch]

Dr. Youngki Kim is an assistant professor in the mechanical engineering department at the University of Michigan-Dearborn (UM-Dearborn). His research includes modeling, simulation, optimization and control of dynamic systems in automotive, energy and transportation. His current research projects are focused on energy-efficient operation of electrified vehicles, smart cruise control of light-duty vehicles, modeling and control of vehicle thermal management systems, modeling and estimation of all-solid-state battery systems, and data-driven approaches to diagnosis and prognosis for degradation of lithium-ion battery systems.

Prior to joining the UM-Dearborn, he was a research engineer at Ann Arbor Technical Center, Southwest Research Institute where he worked on vehicle modeling and control algorithm development for advanced powertrain and autonomous vehicles. From 2003 to 2008, he worked at Hyundai-Kia Motor Company on topics including design and calibration of powertrains such as internal combustion engines and automatic transmissions for improved sound quality. He received his PhD degree (2014) from the University of Michigan, Ann Arbor where his thesis focused on control and estimation of Li-ion battery systems and hybrid electrified vehicles. He received BS (2001) and MS (2003) degrees in the mechanical engineering from the Seoul National University, South Korea. Dr. Kim has received SAE Russell S. Springer award for his outstanding technical paper in 2019. He has published 33 articles in archival journals and 36 papers in refereed conference proceedings and holds 4 patents.

- **October 14, 2022, IEEE Seminar**
 - Speaker: Prof. Yongjune Kim, POSTECH
 - Topic: Efficient Estimation of Min-entropy
 - Attendees: 10 members and 35 non-members

Gwangju Section invited Prof. Yongjune Kim from POSTECH. Professor Kim discussed min-entropy, which is a widely used metric to quantify the randomness of generated random numbers in cryptographic applications; it measures the difficulty of guessing the most likely output.



IEEE Gwangju Section Seminar

Host: Hwang, Euseok / Language: English

Friday, October 14, 2022, 14:30~

Haerim Hall, EECS-B Bldg (C2). 1st Floor

Efficient Estimation of Min-entropy

Yongjune Kim, Ph.D.

Assistant Professor

Department of Electrical Engineering

Pohang University of Science and Technology (POSTECH)

[Abstract]

The min-entropy is a widely used metric to quantify the randomness of generated random numbers in cryptographic applications; it measures the difficulty of guessing the most likely output. An important min-entropy estimator is the *compression estimator* of NIST Special Publication (SP) 800-90B, which relies on Maurer's universal test. In this seminar, we introduce two kinds of min-entropy estimators to improve computational complexity and estimation accuracy by leveraging two variations of Maurer's test: Coron's test (for Shannon entropy) and Kim's test (for Renyi entropy). First, we propose a min-entropy estimator based on Coron's test. It is computationally more efficient than the compression estimator while maintaining the estimation accuracy. The secondly proposed estimator relies on Kim's test that computes the Renyi entropy. This estimator improves estimation accuracy as well as computational complexity. We analytically characterize the bias-variance tradeoff, which depends on the order of Renyi entropy. By taking into account this tradeoff, we observe that the order of two is a proper assignment and focus on the min-entropy estimation based on the collision entropy (i.e., Renyi entropy of order two). The min-entropy estimation from the collision entropy can be described by a closed-form solution, whereas both the compression estimator and the proposed estimator based on Coron's test do not have closed-form solutions. By leveraging the closed-form solution, we also propose a lightweight estimator that processes data samples in an online manner. Numerical evaluations demonstrate that the first proposed estimator achieves the same accuracy as the compression estimator with much less computation. The proposed estimator based on the collision entropy can even improve the accuracy and reduce the computational complexity.

[Bio.]

Yongjune Kim is an assistant professor in the Department of Electrical Engineering at Pohang University of Science and Technology (POSTECH). His research interests include information and coding theory and machine learning. Before joining POSTECH, he was an assistant professor in the Department of Electrical Engineering and Computer Science (EECS) at DGIST and a postdoctoral research associate in the Coordinated Science Laboratory (CSL) at the University of Illinois at Urbana-Champaign (UIUC) hosted by Prof. Naresh R. Shanbhag and Prof. Lav R. Varshney. He was with Western Digital Research, Samsung Electronics and Samsung Advanced Institute of Technology (SAIT). He received the Ph.D. degree advised by Prof. B. V. K. Vijaya Kumar in Electrical and Computer Engineering (ECE) at Carnegie Mellon University (CMU) in 2016. He received the B.S. and M.S. degrees advised by Prof. Jong-Seon No in ECE at Seoul National University (SNU), Korea, in 2002 and 2004, respectively. He received the IEEE Data Storage Best Student Paper Award, the Best Paper Award of the 2016 IEEE International Conference on Communications (ICC), the Best Paper Award (honorable mention) of the 2018 IEEE International Symposium on Circuits and Systems (ISCAS), and the Best Paper Award of the 31st Samsung Semiconductor Technology Symposium.

- **October 26, 2022, IEEE Seminar**

- Speaker: Prof. Myung J. Lee, City University of New York
- Topic: Hardware Machine Learning-based Host Intrusion Detection System using Stochastic Computing
- Attendees: 5 members and 10 non-members

Gwangju Section invited Prof. Myung J. Lee from City University of New York. Professor Lee discussed the information technology evolution toward IoT in the view of entropy expansion with examples in communications.



IEEE Gwangju Section Seminar

Host: Kim, Hong Kook / Language: English
Wednesday, October 26, 2022, 14:00~15:00
203, EECS-B Bldg (C2). 2nd Floor

Hardware Machine Learning-based Host Intrusion Detection System using Stochastic Computing

Myung J. Lee, Ph.D.

Professor
Department of Electrical & Computer Engineering
City University of New York

[Abstract]

As the primary element of connected world, IoT promises to transform the way we work, live, and play. As many of these IoT devices are resource constrained in terms of processing, bandwidth and storage, equipping security and intelligence on these devices faces enormous technical challenges. The hacking of IoT devices and privacy fears already grabbed public attention. If the issue of IoT security is not resolved in a timely manner, the envisioned connected world built on IoT, may be a story in the distant future.

This talk first discusses the information technology evolution toward IoT in the view of entropy expansion with examples in communications. Future trends of IoT technologies will be explored in the core areas of IoT including security and machine learning. To boost the security of resource-constrained IoT, we introduced small form factor, low energy consumed, hardware based HIDS (Host Intrusion Detection System). This innovative design is possible by exploiting the inherent property of Stochastic Computing (SC): a) reduced silicon space and energy consumption; b) operated in probabilistic domain. In SC, complex mathematical operations are implemented probabilistically using simple digital gates. Thus, Deep Neural Network (DNN) can be run in hardware with minimal usage of silicon space using SC. Major challenges in designing DNN using SC domain such as activation function and softmax beget new SC hardware modules theoretically more accurate for NNA. Finally a HIDS system based on SC is implemented using FPGA. A Demo system will be presented at the end, together with a short introduction of Dr. Lee's current research efforts. Q & A followed.

[Bio.]

Dr. Myung Jong Lee received a B.S and an MS from Seoul National University in Korea and Ph.D degree from Columbia University in electrical/electronics engineering. He is currently a professor at the Dept of Electrical & Computer Engineering City University of New York. He is also an adjunct professor at GIST. He was a visiting professor to Bellcore, Seoul National University, and Samsung Advanced Institute of Technology. Dr. Lee's recent research interests include Machine learning approaches for 5g/6G, edge and mobile cloud computing, secure V2X, and stochastic computing applications. His researches have been funded by government agencies and leading industries, including, NSF, ARL, Samsung, ETRI, and NICT. He authored and co-authored over 200 international journal & conference papers, a book (Green IT: Technologies and Applications, Springer)(ed.), book chapters, more than 25 U.S and international patents. Dr. Lee also actively contributes to international standard organizations IEEE and ZigBee (TG chairs for IEEE 802.15.5 & 15.8). Dr. Lee's research group developed the first NS-2 simulator for IEEE 802.15.4, a standard NS-2 distribution widely used for wireless sensor network researches. He received the best paper awards (IEEE CCNC 2005, INCos2019, EAI 2016) and CUNY Performance Excellence Award.

- **November 18, 2022, IEEE Seminar**

- Speaker: Tae-il Kim, Sungkyunkwan University (SKKU)
- Topic: Unconventional Band Pass Filters for Bioelectronics
- Attendees: 10 members and 20 non-members

Gwangju Section invited Prof. Tae-il Kim from Sungkyunkwan University. Professor Kim discussed several methods for band pass filtering for human physiological signals.

IEEE Gwangju Section Seminar

Host: Young Min Song/ Language: Korean

Friday, November 18, 2022, 14:30~

Haerim Hall, GIST EECS-B Bldg. (C2) 1st Floor

Unconventional Band Pass Filters for Bioelectronics

Tae-il Kim, Ph.D.

Associate Professor

School of Chemical Engineering
Sungkyunkwan University (SKKU)

[Abstract]

Biophysiology detection from current advanced electronics is limited by external signal artifacts (e.g. walking and respiration).[1] Here, we present the viscoelastic gelatin/chitosan hydrogel damper inspired by the viscoelastic cuticular pad in a spider to remove dynamic mechanical noise artifacts selectively under 30 Hz. [2] The hydrogel exhibits frequency-dependent phase transition that results in a rubbery state that damps low-frequency noise and a glassy state that transmits the desired high-frequency signals. Instead of the conventional signal processing, the hydrogel damper served as unconventional pass filter that is able to be integrated with advanced bioelectronics for biophysiology detection even in noisy conditions. Also several methods for band pass filtering for human physiological signals will be discussed. [3, 4] It can dissolve chronic noise problems in the bioelectronics, and shows huge potential for uninterrupted monitoring of devices (i.e., gadgets, medical devices, or prostheses) for patients.

[1] Daeshik Kang et al. *Nature* 516, 222 (2014)

[2] Byeonghak Park et al. *Science* 376, 6593 (2022)

[3] Chanho Jeong et al. *Adv. Mater.* 31, 1902689 (2019)

[4] Juwhan Shin et al. *npj Flex. Electron.* 6, 32 (2022)

[Bio.]

Attachment

- **November 24, 2022, IEEE Seminar**

- Speaker: Dr. Jung-jae Kim, Institute for Infocomm Research (I2R), ASTAR, Singapore
- Topic: Knowledge-aware human request translation and multi-modal challenge participations
- Attendees: 5 members and 10 non-members

Gwangju Section invited Dr. Jung-jae Kim from Institute for Infocomm Research (I2R), ASTAR, Singapore. Dr. Kim presented two kinds of works of the Semantic Text Analytics group at Institute for Infocomm Research.

IEEE Gwangju Section Seminar

Host: Hyunju Lee / Language: English

Thursday, November 24, 2022, 13:00~14:00

GIST, Dasan Bldg. 1st Floor #109

Knowledge-aware human request translation and multi-modal challenge participations

Jung-jae Kim, Ph.D.

Department of Machine Intellection
Institute for Infocomm Research (I2R)
ASTAR, Singapore

[Abstract]

We present two kinds of works of the Semantic Text Analytics group at Institute for Infocomm Research. Translation of human request into machine-readable actions over knowledge base/system is desired for enabling human access to the knowledge base/system via language. In this talk, we present our works on two translation tasks. First, questions over knowledge base should be converted into query language (e.g. SPARQL) for information seeking from the knowledge base. We present a language generation method based on a large-scale pre-trained language model for the Q&A over knowledge base. Second, human instructions for controlling robot arms should be converted into robot motion plans. Large-scale pre-trained language models and state-of-the-art semantic parsing methods are tested against a dataset with gearbox assembly/disassembly-related instructions. We also discuss our lessons from participations in international challenges of multi-modal data analytics tasks, in particular video Q&A, including the Audio-Visual Scene-Aware Dialog (AVSD) Challenge 2021, a track of DSTC 10 and the STAR track of the First challenge on Machine Visual Common Sense: Perception, Prediction, Planning (MVCS) @ ECCV 2022.

[Bio.]

He has worked on natural language processing (NLP) and knowledge engineering and is currently leader of Explainable & Automatic AI Group (Semantic Text Analytics) in the Department of Machine Intellection at Institute for Infocomm Research (I2R), ASTAR, Singapore. He also worked as an Assistant Professor at Nanyang Technological University (NTU), Singapore from 2010 to 2015 and as a post-doctoral researcher for European Bioinformatics Institute (EBI), UK from 2006 to 2009. He received his PhD from Korea Advanced Institute of Science and Technology (KAIST), South Korea in 2006. He published over 70 peer-reviewed papers at prestigious journals and conferences.

- **December 2, 2022, IEEE Seminar**

- Speaker: Dr. Hwanjun Song, AI Lab, Naver
- Topic: Research trends in NAVER AI Lab: Data Robustness and Efficiency, Vision Transformers, and Continual Learning
- Attendees: 10 members and 15 non-members

Gwangju Section invited Dr. Hwanjun Song from AI Lab, Naver. Dr. Song discussed Data and models are the two key factors in improving AI system.

IEEE Gwangju Section Seminar

Host: Sundong Kim / Language: Korean
Friday, December 2, 2022, 13:30~15:00
GIST AI Studio (Bldg. S7, 1st Floor)

Research trends in NAVER AI Lab: Data Robustness and Efficiency, Vision Transformers, and Continual Learning

Hwanjun Song, Ph.D.

AI Lab
NAVER

[Abstract]

Data and models are the two key factors in improving AI systems. First, there are two choices in data collection: large-scale data with cheap labeling cost but resulting in severe label noise, and small-scale data with accurate labels but resulting in high labeling cost. We introduce our attempts to achieve data robustness for the former case and data efficiency for the latter case. Second, Vision Transformer has become a mainstream computer vision model, but it requires quadratic computational complexity with respect to input image resolution. We introduce several modern techniques we developed to achieve efficient Transformer backbones for image classification and object detection. Lastly, the importance of continual learning has been increasing by the need of handling streaming data with ever-changing distributions. We discuss the recent trends of continual learning encompassing the aforementioned topics of Data Robustness, Efficiency, and Vision Transformers.

데이터와 모델은 AI 시스템 개선을 위한 두 가지 핵심 요소입니다. 첫째, 데이터와 관련해서는 두 가지 선택이 있습니다: 라벨링 비용은 저렴하지만 라벨 노이즈가 있는 대규모 데이터, 라벨링은 정확하지만 라벨링 비용이 높은 소규모 데이터입니다. 전자의 경우 데이터 견고성을 달성하고, 후자의 경우 데이터 효율성을 달성하려는 시도를 소개합니다. 둘째, Vision Transformer는 주류 컴퓨터 비전 모델이 되었지만 입력 이미지 해상도와 관련하여 2차 계산 복잡도를 요구합니다. 이미지 분류 및 개체 감지를 위한 효율적인 Transformer 백본을 달성하기 위해 개발한 몇 가지 최신 기술을 소개합니다. 마지막으로, 끊임없이 변화하는 분포의 스트리밍 데이터를 처리해야 하는 필요성으로 인해 지속 학습의 중요성이 증가하고 있습니다. 앞서 언급한 Data Robustness, Efficiency, Vision Transformers 주제를 아우르는 지속적인 학습의 최근 경향에 대해 논의합니다.

[Bio.]

Dr. Song is a Research Scientist at NAVER AI Lab. Previously, he graduated with a PhD in February 2021 from the Graduate School of Knowledge Service Engineering (currently, Data Science) at KAIST and worked as a research intern at Google Research, where he worked with two supervisors, Prof. Jae-Gil Lee and Prof. Ming-Hsuan Yang. His current research interests lie in improving the performance of AI technologies under real-world scenarios for AI applications; mainly in designing more advanced approaches to handle ML issues related to data scale and quality. His interests cover a wide range of research topics, including (robust) representation learning, continual learning, federated learning, active learning, computer vision applications (classification, object detection/segmentation), and data mining/database topics (recommender systems, predictions, query optimization, distributed processing).

- **December 9, 2022, IEEE Gwangju Co-sponsored Global Workshop**
 - Speaker: Prof. Jeehwan Kim (Massachusetts Institute of Technology), Prof. Joshua Yang (University of Southern California), Prof. Satofumi Souma (Kobe University), Prof. Yang Chai (The Hong Kong Polytechnic University), Prof. Cunjiang Yu (Penn State University), Dr. Anurag Arnab (Google), Dr. Mathilde Caron (Google)
 - Topic: Semiconductor and AI
 - Attendees: 50 members and 100 non-members
 - 2022 GIST EECS & AI Day Collaborative Workshop for Accelerating Intelligence Semiconductor & AI invited 7 distinguished speakers from US, China, Japan, and France, for discussing potential collaborations on semiconductor and AI areas.

IEEE Gwangju sponsored Workshop

Friday, December 9, 2022, 8:30~17:00


GIST Oryong Hall


2022 GIST EECS & AI Day Collaborative Workshop for Accelerating Intelligence: Semiconductor & AI





Speakers

On-site



Prof. Jeehwan Kim
Massachusetts Institute of Technology



Prof. Joshua Yang
University of Southern California



Dr. Anurag Arnab
Google



Dr. Mathilde Caron
Google

Online


Prof. Satorumi Souma
Kobe University


Prof. Yang Chai
The Hong Kong Polytechnic University


Prof. Cunjiang Yu
Penn State University



Pre-registraion (due Dec. 7)

QR code on the right or the link below
<https://forms.gle/ooGZUL8Q4toMD89>
• Lunch and Dinner for Pre-registrants



Further Information

• Email: gpswpf999@gist.ac.kr • seulhyekim@gist.ac.kr
• Phone: +82-62-715-2267 • +82-62-715-2231



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Published by Dec 9 2022

eecs.gist.ac.kr
ai.gist.ac.kr



**2022 GIST EECS & AI Day
Collaborative Workshop for
Accelerating Intelligence
Semiconductor & AI**



Date **December 9, 2022**
8:30 am - 7:00 pm

Place **Oryong Hall, GIST**

Organizers
• GIST School of EECS, AI Graduate School
• AI Convergence College Support Program

Sponsors
  
  

Greetings



Dean of EECS, GIST
Prof. Byeong Seung Ham

The School of Electrical Engineering and Computer Science is one of the pillars of GIST with the mission to develop advanced core technologies for the nation and specialized technologies for the region. The school started accepting new enrollments in 1995 and ever since has been dedicated to fostering human resources for next-generation IT and IT-convergent technologies and professionals to take the lead in relevant research disciplines.

I look forward to even more professors and students joining us in our journey, and their continued interest in and support for us.

Thank you.



Dean of AI Graduate School, GIST
Prof. Jongwon Kim

In order to raise globalized AI talents to unite education-research-entrepreneurship together, GIST AI Graduate School has begun its operation since October 2019, as one of AI graduate schools sponsored by Ministry of Science and ICT(MSIT).

Upcoming future will become a new era of open collaboration and destructive innovations.

With the so-called AI+X (i.e., AI for X) approach, where open AI technology effectively meets selected domains (X), the positive iteration cycle for AI collaboration ecosystem can become a reality.

To support this future digital transformation, GIST AI Graduate School will be fully open to all of you.

Thank you.

Program

08:30-09:00	Registration & Welcome Reception	Lobby
09:00-09:10	Greeting from GIST President	303 Prof. Kiseon Kim (GIST)
09:10-10:10	Advanced Heterointegration Enabled by Remote Epitaxy	303 Prof. Jeehwan Kim (MIT)
10:10-10:30	Break	Lobby
10:30-11:30	Memristive devices for computing	303 Prof. Joshua Yang (USC)
11:30-12:10	Rubbery Synaptic Transistor and Integrated System (Online)	303 Prof. Cunjiang Yu (Penn State U.)
12:10-13:20	Lunch & EECS Undergraduate Posters	Lobby Lounge Restaurant
13:20-13:30	Undergraduate Awards	Lobby Prof. Jongwon Kim (GIST)
13:30-14:30	Large scale video understanding with transformers	303 Dr. Anurag Arnab (Google)
14:30-15:10	Low-power Neuromorphic In-memory Computing (Online)	303 Prof. Yang Chai (Hong Kong Polytech U.)
15:10-15:30	Break	Lobby
15:30-16:10	Application of machine learning and quantum computational algorithm for semiconductor device simulations (Online)	303 Prof. Satofumi Souma (Kobe Univ.)
16:10-17:10	Self-supervised Vision Transformers	303 Dr. Mathilde Caron (Google)
17:10-18:50	Dinner & EECS/ AI Graduate Posters	Lobby Lounge Restaurant
18:50-19:00	Graduate Awards and Closing	Lobby Prof. Byeong Seung Ham (GIST)

Committee

General Chairs

- Prof. Byeong Seung Ham (School of EECS, GIST)
- Prof. Jongwon Kim (AI Graduate School, GIST)

Technical Program Co-Chairs

- Prof. Euseok Hwang (School of EECS/AI, GIST)
- Prof. Jeany Son (AI Graduate School, GIST)
- Prof. Hyeonho Jeong (School of EECS, GIST)
- Prof. Dong-Seon Lee (School of EECS, GIST)
- Prof. Young Min Song (School of EECS, GIST)
- Prof. Jong Won Shin (School of EECS/AI, GIST)
- Dr. Byung-Tak Lee (ETRI)

Technical Session Chair

- Morning Prof. Dong-Seon Lee (School of EECS, GIST)
Prof. Uehwan Kim (AI Graduate School, GIST)
- Afternoon Prof. Jeany Son (AI Graduate School, GIST)
Prof. Euseok Hwang (School of EECS/AI, GIST)

Sponsors

- Welcome Reception sponsored by GIST Sec. Int. Relations
- Coffee breaks & Lunch sponsored by GIST 'On-A-Hi' Proj. Plan.
- Raffles sponsored by IEEE Gwangju
- Dinner sponsored by GIST School of EECS, AI, G-NICS
- Event promotion sponsored by AICA and ETRI



December 9, 2022 / Oryong Hall, GIST

B.4 Students Activities

- Total number of Student Branches in the Section

N/A

- Number of Student Branches formed in the current year

N/A

- Section level student activities (student congress, paper and other contests, awards etc)

N/A

- Number of active Student Branches (Student Branches who have reported required number of meetings during the year)

N/A

- Summary of Student Branch activities (Student Branch wise with attachment table/information)

N/A

B.5 Affinity Group Activities

- Young Professional (YP)

N/A

- Women In Engineering (WIE)

N/A

- Life Member (LM)

N/A

B.6 Awards & Recognition Activities

- Award constituted by the Section

N/A

- Please list all Awards and Recognitions received by the Section, and members in the Section, from R 10 and IEEE HQ during the year

N/A

B.7 Communication Activities (Newsletter, Home Page, E-mail etc.)

- Newsletter (name and number of issues in the year)

N/A

- Home Page of the Section (give the URL and how often it is updated)

The URL of the home page of the Gwangju Section is <https://sites.google.com/view/ieee-gwangju/home>
The home page is updated based upon the event (for example, a technical seminar).

- Other means of contacts with Section members including social media

N/A

B.8 Industry Relations

- Membership growth and retention

N/A

- Activities for/with industrial members

N/A

B.9 Humanitarian Technology Activities

- Humanitarian Technology related activities supported by the Section including collaboration with other OUs.

N/A

- SIGHT Activities

N/A

B.10 Community Activities

- IEEE Social activities (Family day, IEEE day, Engineers Week)

N/A

PART C - OTHERS

C.1 Special Events

- Please briefly describe the importance of special events and the outcomes achieved

N/A

- Funding secured from the IEEE and external sources including sponsorships

N/A

C.2 Relationship with National and International Societies and Non-Government Organizations (NGO)

- Nature of relationship and details of any formal agreement signed

N/A

- Details of joint activities

N/A

- Benefit to IEEE members (for example discounts, access to technical information etc.)

N/A

- Benefit to Section (for example help in membership development, venue facilities, cost saving etc.)

N/A

C3. Collaboration with other IEEE Sections

- Support extended to neighboring Sections

N/A

- Joint activities with any other Section

N/A

C.4 Support extended to Sub-sections & Society Chapters within the Section

- Support extended for organising technical, educational and professional activities

N/A

- Joint activities for membership development

N/A

- Support extended for the formation of a Sub-section or transition of a Sub-section into a full Section

N/A

C.5 Best Practices of your Section (which you would like to share with other Sections for the benefits of members)

C.6 Problems anticipated and suggestions for solutions, if any

PART D - GOALS AND PLANS

D.1 Continuation of project/activity in progress and their implementation plans

D.2 Goals and Future Plans

It is expected that social eveny in South Korea can be organized without restrictions in 2023. Therefore, we expect that we can organize more on-site events (For example, high-quality technical seminars) in 2023. Another activity which can be made is the partial reimbursement of the student membership fee. The incentive will be very helpful for maintaining (and even increasing) the number of our student members.

D.3 Any innovative ideas to make IEEE more creative and value added for sustaining the membership retention and recruitment goals.

D.4 Business Plan for Sustainable Growth and Financial Stability.