



ICUFN 2024

The 15th International Conference on Ubiquitous and Future Networks

July 2 (Tue.) ~ 5 (Fri.), 2024

Budapest University of Technology and Economics, Budapest, Hungary & Virtual Conference

<https://icufn.org>



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The 15th International Conference on Ubiquitous and Future Networks (ICUFN)

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DDI 2024

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 Kamal Deep Singh (University Jean Monnet Saint-Etienne, France)
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 Hsing-Chung Chen (Asia University, Taiwan)
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Workshop Chair:

Yeong Min Jang (Kookmin University, Korea)

BIC 2024

Workshop Chair:

Ki-Hyung Kim (Ajou University, Republic of Korea)

Message from Organizing Committee Chairs

On behalf of the Organizing Committee, we would like to take this opportunity to express our excitement at hosting ICUFN 2024 in Budapest, Hungary and online from 2 to 5 July 2024. ICUFN 2024 is organized by KICS and technically co-sponsored by IEEE Communications Society (ComSoC) and IEICE Communications Society. With 15 years of history, the ICUFN conference has served as a premier international forum to provide a great opportunity for exchanging the state-of-the-art research advances in ubiquitous and future communications & networking technologies and expanding the research community. On behalf of the Organizing Committee, it is my great pleasure to welcome you to ICUFN 2024 in the beautiful city of Hungary.

Budapest, often called the “Pearl of Danube” is a captivating blend of historic charm and modern vibrancy, renowned for its stunning architecture, rich cultural heritage, and numerous thermal baths. The city, straddling the majestic Danube River, offers a unique experience with its scenic beauty, bustling markets, and vibrant nightlife. From the grandeur of Buda Castle to the lively atmosphere of the Ruin Bars, Budapest is a city that enchants every visitor. The city has embraced the digital age while preserving its unique heritage, making it an ideal setting for discussing the latest advancements in ubiquitous and future networks.

ICUFN 2024 will provide a platform for researchers, engineers, and industry professionals to exchange ideas, share knowledge, and foster collaborations in this ever-evolving field. We have prepared an exciting program for you in ICUFN 2024. Distinguished keynote speeches and tutorials on hot topics will also be delivered by highly prominent experts. We would like to express our sincere gratitude to all committee members and referees who made tremendous contributions to this event. In particular, our special thanks go to Technical Program Committee Chairs, Professors Sangheon Pack, Xin WANG, Suguru Kameda, Kun Yang, Lingyang Song, Periklis Chatzimisios, and all TPC members for their great efforts in preparing the technical program. Special thanks are extended to all workshop organizers for preparing excellent workshops. We would also like to express special gratitude to Budapest University of Technology and Economics (BME), Hungary for their support in hosting the conference, especially to Prof. Bálint KISS, whose dedication in overseeing the local arrangements is truly commendable. We do hope that you will take this unique opportunity to attend the technical and workshop sessions, meet the authors, and foster greater collaboration with other researchers. The Organizing Committee put a lot of effort to make this conference greatly successful and enjoyable. We look forward to seeing you at ICUFN 2024 in Budapest or online!



Dong Seog Han
Kyungpook National
Univ., Korea



Ki-Hyung Kim
Ajou University,
Korea



Takeo Fujii
Univ. of Electro-
Comms, Japan



Mislav Grgic
Univ. of Zagreb,
Croatia



Zary Segall
KTH,
Sweden



Zdenek Becvar
Czech Technical Univ.
in Prague, Czechia

Message from TPC Chairs

We are delighted to welcome all of you to Budapest, Hungary, from July 2nd to 5th, 2024, for the fifteenth International Conference on Ubiquitous and Future Networks (ICUFN 2024). ICUFN has been addressing all aspects of computing, networking, communications, and their convergence since 2009. ICUFN 2024 will also be a successful conference, covering a wide range of topics on ubiquitous and future network technologies.

This year, we received submissions from 29 countries worldwide. The submitted papers underwent a rigorous review process, with each paper receiving three or more independent reviews. Based on the reviews, we selected 65 papers for oral presentations and 49 papers for poster presentations during the main conference. Additionally, we chose 40 workshop papers for presentation. The accepted technical papers have been organized into 15 oral sessions and 4 poster sessions, along with 6 workshops.

The program of ICUFN 2024 is designed to encompass a wide range of wireless and wired communications network technologies. It will cover topics such as cognitive radios, wireless sensor networks, Internet of Things (IoT), broadband wireless communications, future network issues, mobile multimedia networking, and emerging technologies like AI and ML. We are grateful for the contributions of distinguished authors from various parts of the world, whose expertise has greatly enriched this year's program. We would like to express our sincere appreciation to the technical program committee (TPC) members for their active participation and valuable time dedicated to reviewing and selecting the papers. Their efforts have played a vital role in shaping the high-quality content of the conference. Furthermore, we would like to extend our gratitude to our sponsors, KICS and IEEE Communications Society, for their generous support, which has contributed to the success of this event. Our heartfelt thanks go to the Organizing Committee Chairs, Prof. Dong Seog Han, Prof. Ki-Hyung Kim, Prof. Takeo Fujii, Prof. Mislav Grgic, Prof. Zary Segall, and Prof. Zdenek Becvar, for their continuous support and guidance in planning and organizing the conference. Lastly, we hope that all attendees will not only enjoy the splendid program of ICUFN 2024 but also appreciate the beautiful scenery and charm of Budapest, adding to the overall experience of the conference.

Sincerely



Sangheon Park
Korea Univ.,
Korea



Xin WANG
Fudan Univ.,
China



Suguru Kameda
Hiroshima Univ.,
Japan



Kun Yang
Univ. of Essex,
UK



Lingyang Song
Peking Univ.
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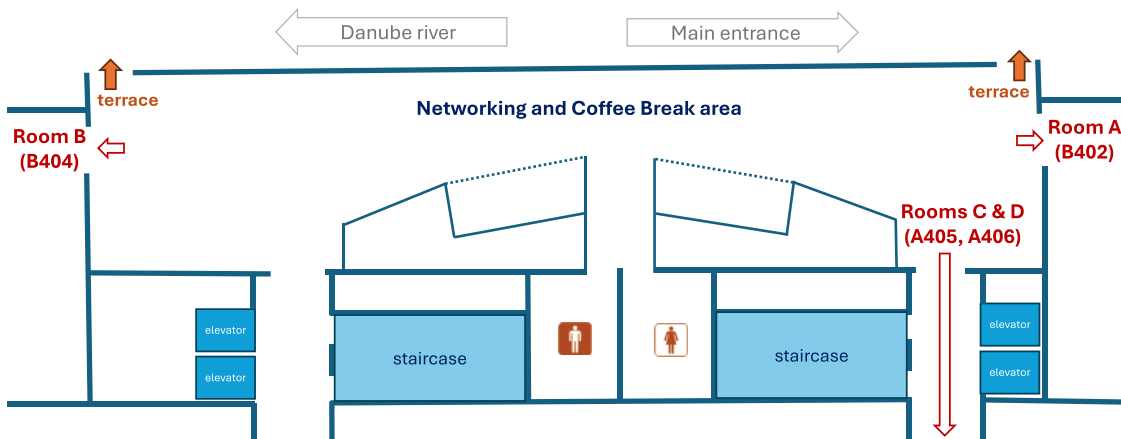
Periklis Chatzimisios
ATEITHE,
Greece

ICUFN 2024 Program at a Glance

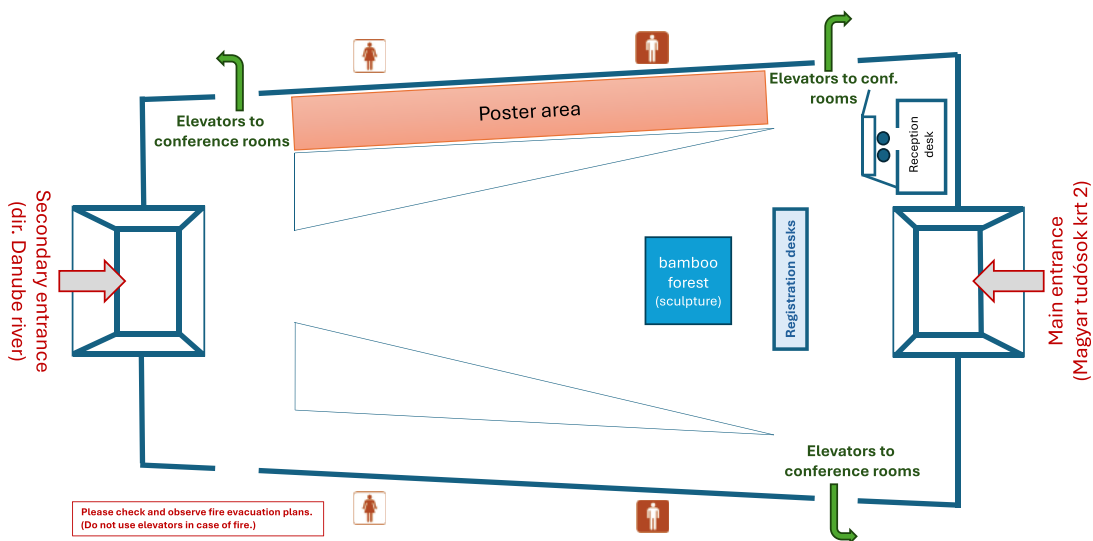
July 1, 2024 (Monday)					
14:00 ~ 17:00	ICUFN Committee Meeting (IAC/SC/OC)				
Room	Room A (B402)	Room B (B404)	Room C (A405)	Rooms D (A406)	Lobby
July 2, 2024 (Tuesday)					
13:00 ~ 17:00	Registration				
13:30 ~ 15:00	Workshop 1A The 11th International Workshop on Intelligent Vehicles 2024 (IV 2024 I)	Workshop 1B The 5th International Workshop on Smart Radio for IoT Era (SRIoT 2024 I)	Workshop 1C The 4th International Workshop on Big Data and 5G&6G Communication Network (B5G/6G 2024)	Workshop 1D The 2nd International Workshop on Blockchain Intelligence Convergence + The 3rd International Workshop on Data Driven Intelligence (BIC 2024 + DDI 2024)	
15:00 ~ 15:30	Coffee Break				
15:30 ~ 17:00	Workshop 2A The 11th International Workshop on Intelligent Vehicles 2024 (IV 2024 II)	Workshop 2B The 5th International Workshop on Smart Radio for IoT Era (SRIoT 2024 II)	Workshop 2C The 11th International Workshop on Intelligent Vehicles 2024 (IV 2024 III)		
July 3, 2024 (Wednesday)					
09:00 ~ 09:30	Preparation, Registration, and Networking				
Room	Room A (B402)				
09:30 ~ 10:30	Tutorial 1 <i>Chair: Sangheon Park (Korea University, Korea)</i> Quantum communication: current trends and implementation challenges Prof. László Bacsárdi (Budapest University of Technology and Economics, Hungary)				
10:30 ~ 11:30	Opening Address <i>Chair: Insoo Sohn (Dongguk Univ., Korea)</i> Prof. Dong Seog Han, Organizing Committee Chair Welcome Address 1 Prof. Seong Ho Jeong (President of KICS) Welcome Address 2 Prof. János Levendovszky (Vice-rector for Research and Innovation, Budapest University of Technology and Economics, Hungary) Keynote Speech 1 Communications and Networking in LEO Mega-Constellations Prof. Gunes Karabulut-Kurt (Polytechnique Montréal, Canada)				
11:30 ~ 13:30	Lunch				

Room	Room B (B404)	Room C (A405)	Rooms D (A406)	Lobby	Room A (B402)
13:30 ~ 15:00	Oral Session 1A AI/ML Applications	Oral Session 1B AI/ML for Mobile Communications	Oral Session 1C 5G and 6G		Editorial Board Meeting Award Ceremony for ICT Express
15:00 ~ 15:30	Coffee Break				
15:30 ~ 17:00	Oral Session 2A IoT Systems and Applications	Oral Session 2B IoT for e-Health	Oral Session 2C IoT Networks	Poster Session 1 (P1)	
18:00 ~ 20:00	Banquet (Radisson Hotel Budapest BudaPart) <i>Chair: Sang-Chul Kim (Kookmin University, Korea)</i>				
July 4, 2024 (Thursday)					
09:00 ~ 09:30	Preparation, Registration, and Networking				
Room	Room A (B402)				
09:30 ~ 10:30	<i>Chair: Pyung Soo Kim (Tech University of Korea, Korea)</i> Tutorial 2 Detecting anomalies in computer logs Prof. Horváth Gábor (BME, AI, National Lab, Hungary)				
10:30 ~ 11:30	<i>Chair: Dong Seog Han (Kyungpook National Univ., Korea)</i> Keynote Speech 2 UWB Communications: Dreams, Facts and Future Prof. Géza Kolumbán (Pázmány Péter Catholic University in Budapest, Hungary)				
11:30 ~ 13:30	Lunch				
Room	Room B (B404)	Room C (A405)	Rooms D (A406)	Lobby	Room A (B402)
13:30 ~ 15:00	Oral Session 3A Big Data and Computing	Oral Session 3B Social Networks and Security	Oral Session 3C QoS and QoE	Poster Session 2 (P2)	
15:00 ~ 15:30	Coffee Break				
15:30 ~ 17:00	Oral Session 4A Programmable Networks	Oral Session 4B V2X Communications	Oral Session 4C Wireless Communications	Poster Session 3 (P3)	
July 5, 2024 (Friday)					
09:00 ~ 09:30	Preparation, Registration, and Networking				
Room	Room B (B404)	Room C (A405)	Rooms D (A406)	Lobby	Room A (B402)
09:30 ~ 11:00	Oral Session 5A Satellite Networks	Oral Session 5B UAV and Mobility	Oral Session 5C Radio Resource Management	Poster Session 4 (P4)	Workshop 2D OCC and FSO 2024
Closing					

Q building 4th floor (Conference rooms)



Q building, Lobby level



10:30 ~ 11:30, July 3, 2024 (Wednesday)

Room: Room A (B402)

Keynote Speech 1: Communications and Networking in LEO Mega-Constellations

Chair: Insoo Sohn (Dongguk Univ., Korea)

Speaker: Prof. Gunes Karabulut-Kurt, Polytechnique Montréal, Canada

Abstract:

The emerging low Earth orbit (LEO) mega-constellation networks, planned to be composed of thousands of satellites, have the potential to connect all through their global footprint and bridge the long-existing digital divide. This talk will focus on the communications and networking aspects of these mega-constellations and their integration with the terrestrial networks. The associated communication and networking problems will be investigated along with potential remedies such as the use of distributed massive MIMO and high altitude platform station (HAPS) systems. The talk will conclude with an overview of the open issues and future research directions.



Biography

Gunes Karabulut-Kurt is a Canada Research Chair (Tier 1) in New Frontiers in Space Communications and Associate Professor at Polytechnique Montréal, Montréal, QC, Canada. She is also an adjunct research professor at Carleton University. Gunes received the B.S. degree with high honors in electronics and electrical engineering from Bogazici University, Istanbul, Turkey, in 2000 and the M.A.Sc. and the Ph.D. degrees in electrical engineering from the University of Ottawa, ON, Canada, in 2002 and 2006, respectively. She worked in different technology companies in Canada and Turkiye, between 2005 and 2010. From 2010 to 2021, she was a professor at Istanbul Technical University. Gunes is a Marie Curie Fellow and has received the Turkish Academy of Sciences Outstanding Young Scientist (TÜBA-GEBIP) Award in 2019. She is serving as the secretary of IEEE Satellite and Space Communications Technical Committee, the chair of the IEEE special interest group entitled "Satellite Mega-constellations: Communications and Networking" and also as an editor in different IEEE journals. She is a member of the IEEE WCNC Steering Board and a Distinguished Lecturer of Vehicular Technology Society Class of 2022. Her research interests include multi-functional space networks, space security, and wireless testbeds.

10:30 ~ 11:30, July 4, 2024 (Thursday)

Room: Room A (B402)

Keynote Speech 2: UWB Communications: Dreams, Facts and Future

Chair: Dong Seog Han (Kyungpook National Univ., Korea)

Speaker: Prof. Géza Kolumbán (Pázmány Péter Catholic University in Budapest, Hungary)

Abstract:

Ultra WideBand (UWB) radio is an emerging new way of communication where the bandwidth occupied is many times greater than the minimum one required to deliver the information. The excess bandwidth is used to meet special application requirements. The other feature that makes UWB communications very unique is that, apart from two limits that restrict the interference caused in conventional radio systems, there are no restrictions on the shape of transmitted signal. Any kind of signal shape can be applied, most UWB systems do not even use a sinusoidal carrier. The use of conventional radio systems requires a license. The most attractive UWB feature is that a license-free reuse of the already occupied radio spectrum is allowed. UWB transmitters may interfere with the existing conventional radio links provided that the UWB interference does not cause a noticeable performance degradation in the existing radio services. Other benefits of UWB communications include excellent robustness against multipath propagation, potential for very simple implementation and ultra-low power consumption. Unfortunately, UWB technology can be used only in short-range applications because of two reasons: (i) interference regulations that limit the transmitted power and (ii) only observation-type noncoherent detectors are feasible. The tutorial will survey UWB technology and highlight the theoretical reasons for the short radio coverage. To get its potential applications, both the advantages and limitations of UWB radio will be discussed.



Biography

Géza Kolumbán (IEEE Life Fellow) has received a Ph.D. degree from the Technical University of Budapest, Hungary, his C.Sc. and D.Sc. degrees from the Hungarian Academy of Sciences. From 2013 to 2014, he served as an IEEE CAS Distinguished Lecturer. He spent 15 years in the telecommunications industry developing microwave circuits, PLL-based frequency synthesizers and was involved in many system engineering projects from satellite telecommunications to microwave terrestrial radio communications. After joining the university education, he showed that chaos may exist in autonomous PLLs and established noncoherent chaotic communications, a branch of UWB communications, as a new research direction. He has developed DCSK and FM-DCSK, the most popular chaotic modulation schemes. Two articles co-authored by him on chaos-based communications have been ranked in the top cited IEEE Trans. on CAS—I: Regular Papers. He has elaborated a unified theory for the Software-Defined Electronics (SDE) systems and received the ICT Express Best Paper Award in 2017 for the SDE concept. He has been a Visiting Professor and Researcher with UC Berkeley, PolyU and CityU in Hong Kong, University College Dublin and Cork, Ireland, EPFL, Lausanne, Switzerland, the INSA-LATTIS Laboratory, Toulouse, France, TU Dresden, Germany, and Beijing Jiaotong University, China. He has provided consulting services for many companies from the Samsung Advanced Institute of Technology to National Instruments. He is a Professor Emeritus at the Pázmány Péter Catholic University, Budapest, Hungary, and an Adjunct Professor at the Edith Cowan University, Perth, Australia.

09:30 ~ 10:30, July 3, 2024 (Wednesday)

Room: Room A (B402)

Tutorial 1: Quantum communication: current trends and implementation challenges

Chair: Sangheon Park (Korea University, Korea)

Speaker: Prof. László Bacsaárdi (Budapest University of Technology and Economics, Hungary)

Abstract:

The second revolution in quantum technology has given us several tools based on the laws of quantum physics: quantum computers, quantum random number generators, quantum communication solutions. We can exploit the principle of photon sources to generate true random numbers, and quantum key distribution devices significantly increase the security level of our existing encryption systems. By exploiting the phenomenon of entanglement, we can create the building blocks of the quantum internet of the future.

Several initiatives have been launched around the world to build quantum key distribution networks, including the European Quantum Communication Infrastructure (EuroQCI), in which Hungary is participating. At the Faculty of Electrical Engineering and Information Technology of the Budapest University of Technology and Economics, we have developed fiber-based and free-space quantum communication systems.

In this talk, we will present the main characteristics of quantum communication, discuss some interesting implementation challenges and highlight Hungarian developments.



Biography

László Bacsaárdi [m07] (bacsaardi@inf.nyme.hu) obtained his M.Sc. degree in computer engineering from Budapest University of Technology and Economics (BME), Hungary, in 2006. He wrote his Ph.D. thesis on the possible connection between space communications and quantum communications at the BME Department of Telecommunications in 2012. His current research interests are in mobile ad hoc communication, quantum computing, and quantum communications. From 2009, he works at the University of West Hungary, Sopron, Hungary. Currently, he is an associate professor and head of the Institute of Informatics and Economics.

He is the Secretary General of the Hungarian Astronautical Society (MANT), which is the oldest Hungarian non-profit space association, founded in 1956. He is a member of the Board of a Hungarian scientific newspaper (World of Nature) and the publisher of a non-profit Hungarian space news portal (Space World). Furthermore, he is a member of the American Institute of Aeronautics and Astronautics and the Scientific Association for Info-communications Hungary, HTE (an IEEE and IEEE ComSoc Sister Society). He has joined the Space Generation Advisory Council, currently active in the organization as the Hungarian National Point of Contact.

09:30 ~ 10:30, July 4, 2024 (Thursday)

Room: Rooms A (B402)

Tutorial 2: Detecting anomalies in computer logs

Chair: Pyung Soo Kim (Tech University of Korea, Korea)

Speaker: Prof. Horváth Gábor (BME, AI, National Lab, Hungary)

Abstract:

Industrial and IT systems produce and collect a tremendous amount of logs during their everyday operation. The lines of the log files represent an important, rich source of information for a domain expert helping to deduce the state of the system, to identify suspicious activity or to identify the first signs of future anomalies. To reduce the cost and to enable real-time processing, several machine learning based methods appeared for supporting the automatic analysis of system logs. The goal of these systems is to identify operation anomalies, log line sequences that need attention and possibly human intervention. This task is much more than just detecting error messages and failures, as many important anomalies only manifest themselves in the order or in the timing of normal looking log lines. In this talk we present some algorithms for log anomaly detection, starting with the most cited methods in the literature and ending with our solution that does not require supervised training and relies on minimal human intervention.



Biography

Horváth Gábor received the MSc degree in computer engineering from the Budapest University of Technology and Economics, Budapest, Hungary, in 2001, and the PhD degree in computer engineering from the same university, in 2006. Currently, he is a full professor with the Department of Networked Systems and Services, and the Vice-Dean for Science at the Faculty of Electrical Engineering and Informatics, Budapest University of Technology and Economics. His main research interests are modeling, optimization and efficient operation of telecommunication and computer networks, for which he has used stochastic processes, Markov chains and queuing systems for many years. Recently he has been researching data-driven machine learning solutions. His results have been incorporated into products used in practice by large telecom operators.

July 2, 2024 (Tuesday)**Workshop 1A: The 11th International Workshop on Intelligent Vehicles 2024 (IV 2024 I)***Chair: Dong Seog Han (Kyungpook National University, Korea)***Room A (B402), Time 13:30 ~ 15:00**

- [W1A-1] **Real-Time Multi-Camera Traffic Analysis for V2I Based Cooperative Driving Protocol**
Junhyek Jang (Korea Electronics Technology Institute, Korea (South)); Sang Hun Yoon, Byoungman An, Dae Kyo Shin, Seonghyun Jang and Soo Hyun Jang (Korea Electronics Technology Institute, Korea (South))
- [W1A-2] **Using Multi-Scale Feature Predictions for FPN Architecture Based Real-Time Semantic Segmentation**
Quyen Van Toan and Min Young Kim (Kyungpook National University, Korea (South))
- [W1A-3] **A Study on Automotive Data Compression Technology On-Device Platform**
Yong Cheol Ro and Dae Kyo Shin (Korea Electronics Technology Institute, Korea (South)); Junhyek Jang (Korea Electronics Technology Institute, Korea (South)); Seonghyun Jang and Soo Hyun Jang (Korea Electronics Technology Institute, Korea (South))
- [W1A-4] **Experimental 5G-NR-V2X Evaluation in a Real-Life Highway and Proving Ground Environment**
Byoungman An, Seonghyun Jang and Soo Hyun Jang (Korea Electronics Technology Institute, Korea (South)); Junhyek Jang (Korea Electronics Technology Institute, Korea (South)); Dae Kyo Shin and Sang Hun Yoon (Korea Electronics Technology Institute, Korea (South))
- [W1A-5] **Scalable Emotion Recognition Model with Context Information for Driver Monitoring System**
Savina Jassica Colaco (Kyungpook National University & Center for ICT & Automotive Convergence, Korea (South)); Dong Seog Han (Kyungpook National University, Korea (South))

Workshop 1B: The 5th International Workshop on Smart Radio for IoT Era (SRIoT 2024 I)*Chair: Suguru Kameda (Hiroshima University, Japan)***Room B (B404), Time 13:30 ~ 15:00**

- [W1B-1] **Sub-1 GHz Band Wireless Coexistence Study for OFDM Systems in IEEE 802.19.3a**
Yukimasa Nagai (Mitsubishi Electric Corp., Japan); Jianlin Guo (Mitsubishi Electric Research Laboratories, USA); Benjamin Rolfe (Blind Creek Associates, USA); Kazuto Yano (ATR, Japan); Takenori Sumi (Mitsubishi Electric Corporation, Japan); Kieran Parsons and Philip Orlik (Mitsubishi Electric Research Laboratories, USA); Pu Wang (Mitsubishi Electric Research Laboratories (MERL), USA)

- [W1B-2] **Indoor Positioning Using BLE Beacons and User Equipments in Factory Environment**
Kohei Yuzawa (University of Electro-Communications, Japan); Takeo Fujii (The University of Electro-Communications, Japan)
- [W1B-3] **A Study on Throughput Coverage Evaluation of Non-Terrestrial Communication Base Stations**
Gia Khanh Tran (Tokyo Institute of Technology, Japan)
- [W1B-4] **Proposal and Evaluation of a Hidden Terminal Identification Method Using Terminal-To-Terminal Information Exchange for Highly Sensitive Carrier Sensing in LPWAN**
Masahiro Mizuno and Osamu Takyu (Shinshu University, Japan)
- [W1B-5] **A Method for Estimating Local 5G Time Division Duplex Patterns Using Spectrum Sensing**
Hayato Mitsuhashi and Osamu Takyu (Shinshu University, Japan); Kohei Yoshida and Junichi Funada (NEC Corporation, Japan); Masayuki Ariyoshi (NEC Corporation, Japan)
- [W1B-6] **An Evaluation of Channel Estimation Method Using Deep Learning for OFDM System**
Teruji Ide, Ryo Onishi and Tadatomo Sato (National Institute of Technology, Kagoshima College, Japan)

Workshop 1C: The 4th International Workshop on Big Data and 5G&6G Communication Network (B5G/6G 2024)*Chair: Sungrae Cho (Chung-Ang University, Korea)***Room C (A405), Time 13:30 ~ 15:00**

- [W1C-1] **Advancing Multi-Agent Systems Integrating Federated Learning with Deep Reinforcement Learning: A Survey**
Jaemin Kim, Gahyun Kim, Seonghun Hong and Sungrae Cho (Chung-Ang University, Korea (South))
- [W1C-2] **Reinforcement Learning-Based UAV Handover Algorithm in Cellular Networks: A Survey**
Gahyun Kim, Jaemin Kim, Seonghun Hong and Sungrae Cho (Chung-Ang University, Korea (South))
- [W1C-3] **A Research Trends of Reinforcement Learning Algorithms for C-V2X Network Resource Allocation**
Seonghun Hong, Jaemin Kim, Gahyun Kim and Sungrae Cho (Chung-Ang University, Korea (South))
- [W1C-4] **A Review on UAV-Assisted Resource Allocation**
Tung Son Do, Thanh Phung Truong, Anh-Tien Tran and Dongwook Won (Chung-Ang University, Korea (South)); Nhu-Ngoc Dao (Sejong University, Korea (South)); Sungrae Cho (Chung-Ang University, Korea (South))
- [W1C-5] **Performance Analysis of Small Cell and Integrated Cell Scenarios in Private 5G Networks Based on Empirical Data**
YuVin Kim, Jong-Seok Rhee, Sung-Jin Lee and Een-Kee Hong (Kyunghee University, Korea (South))

Workshop 1D: The 2nd International Workshop on Blockchain Intelligence Convergence + The 3rd International Workshop on Data Driven Intelligence (BIC 2024 + DDI 2024)

Chair: Ki-Hyung Kim (Ajou University, Korea)

Rooms D (A406), Time 13:30 ~ 15:00

- [W1D-1] A Study on Universal Digital Wallet for Web 3
Geun-Hyung Kim (Dong Eui University, Korea (South))
- [W1D-2] A Blockchain System for MUM-T in Tactical Wireless Networks
Jongkwan Lee (Korea Military Academy, Korea (South)); Minwoo Lee (Korea Maritime and Ocean University, Korea (South))
- [W1D-3] Design of an Integrated System for Responding to Emergency Situations by Identifying Users' Life Logs
Yumin Jo and Jong Ho Paik (Seoul Women's University, Korea (South))

Workshop 2A: The 11th International Workshop on Intelligent Vehicles 2024 (IV 2024 II)

Chair: Min Young Kim (Kyungpook National University, Korea)

Room A (B402), Time 15:30 ~ 17:00

- [W2A-1] Collision Prediction and Driving Safety Warning System for Mobile Robots Using 3D LiDAR and 2D Cameras
Jun Seok Oh and Min Young Kim (Kyungpook National University, Korea (South))
- [W2A-2] Design of Horticultural Therapy Content in Virtual Reality Environment
Soo-Kyun Kim, JinWoong Kim, InChul Han and Hoyoung Kwak (Jeju National University, Korea (South))
- [W2A-3] Facial Expression Parameters Extraction Using Graph Convolution Networks
Soo-Kyun Kim, JeeSic Hur, JinWoong Kim, DoHyeun Kim and Hyeong-Geun Lee (Jeju National University, Korea (South))
- [W2A-4] High-Efficiency Integrated Resonant Dual Active Bridge Converter with Seamless Mode Transition over a Wide Load Range
Yoo-Seop Kim, Yeong-Jun Choi and Tae Seok Kang (Jeju National University, Korea (South))
- [W2A-5] Phase Asymmetric Interleaving Method to Reduce Current Ripple in Boost PFC Converter Using Model Predictive Current Control
Hee-Jeong Seon (Jeju National University, Korea (South)); Hyun-Gyu Koh (Jeju National University & Jeju-Do, Korea (South)); Yeong-Jun Choi (Jeju National University, Korea (South))

Workshop 2B: The 5th International Workshop on Smart Radio for IoT Era (SRIoT 2024 II)

Chair: Takeo Fujii (The University of Electro-Communications, Japan)

Room B (B404), Time 15:30 ~ 17:00

- [W2B-1] Enhancing Data Rate of Asynchronous Pulse Code Multiple Access for Massive IoT
Mayu Selena Horiuchi, Ms. and Atsushi Nakamura (Tokyo University of Science, Japan); Ferdinand Peper (National Institute of Information and Communications Technology, Japan); Kenji Leibnitz (NICT, Japan); Naoki Wakamiya (Osaka University, Japan); Maki Arai and Mikio Hasegawa (Tokyo University of Science, Japan)
- [W2B-2] Evaluation of Time Synchronization Accuracy of Wireless Two-Way Interferometry (WI-WI): Consideration of Distance Dependence in NLOS Environment
Toshiki Ouchi, Tatsuya Hatagi, Serena Akasaka and Suguru Kameda (Hiroshima University, Japan); Satoshi Yasuda and Nobuyasu Shiga (National Institute of Informations and Communications Technology, Japan)
- [W2B-3] Towards Robust Communication in ITS: A Comprehensive Study of Blockchain for V2I
Atsuki Yoshimura and Jin Nakazato (The University of Tokyo, Japan); Manabu Tsukada (The University of Tokyo, Japan); Hiroshi Esaki (The University of Tokyo, Japan)
- [W2B-4] Experimental Results of Capture Effect on LPWA Signals in Multiple Interferences Environment
Takumi Ueno and Shusuke Narieda (Mie University, Japan); Takeo Fujii (The University of Electro-Communications, Japan)
- [W2B-5] Impact of Inexpensive Oscillator in Wireless Sensor Node on Packet-Level Index Modulation Method Under Real Environment
Mai Ohta and Hitoshi Yamasaki (Fukuoka University, Japan); Hiroki Matsuura (NATANE eICT Lab., Japan); Makoto Taromaru (Fukuoka University, Japan)
- [W2B-6] Resource Management for Wireless Power Transfer and Wireless Information Transfer in Industrial IoT
Daichi Watabe, Kotaro Yoshikawa and Koichi Adachi (The University of Electro-Communications, Japan)
- [W2B-7] Analysis of Spread Spectrum Pilot Signals to Suppress Co-Channel Interference for Microwave Power Transfer
Yu Kagaya, Zhengdong Lin, Daisuke Kobuchi, Hiroyuki Morikawa and Yoshiaki Narusue (The University of Tokyo, Japan)

Workshop 2C: The 11th International Workshop on Intelligent Vehicles 2024 (IV 2024 III)

Chair: Savina Jassica Colaco (Kyungpook National University & Center for ICT & Automotive Convergence, Korea)

Room C (A405), Time 15:30 ~ 17:00

- [W2C-1] Design Procedure for Mitigating Current Distortion in Boost PFC Converters Utilizing PCMC Under Light-Load Conditions
Juil Kim, Jihun So and Yeong-Jun Choi (Jeju National University, Korea (South))
- [W2C-2] Art Mental Care Simulation Design Using ETC Technique
Soo-Kyun Kim, InChul Han, JinWoong Kim, Yeochan Yoon and Dongho Yang (Jeju National University, Korea (South))
- [W2C-3] Design of Facial Convolutional Mesh Autoencoder
Soo-Kyun Kim, JeeSic Hur, Hyeong-Geun Lee and InChul Han (Jeju National University, Korea (South))
- [W2C-4] Performance Comparison of Optimizers for YOLOv8n Based Smoker Object Detection
Hyunsu Jeong, Yeochan Yoon, Hoyoung Kwak and Joon-Min Gil (Jeju National University, Korea (South))
- [W2C-5] Development of an Artificial Intelligence Device Management System Using Over-The-Air Technology
Jinhong Kim (Electronics and Telecommunications Research Institute (ETRI), Korea (South)); Yun-Won Choi (Electronics & Telecommunications Research Institute, Korea (South)); Jang Woon Baek and Kwangju Kim (ETRI, Korea (South)); Dongkyun Kim (Kyungpook National University, Korea (South))

July 5, 2024 (Friday)

Workshop 2D: OCC and FSO 2024

Chair: Huy Nguyen (Kookmin University, Korea)

Room A (B402), Time 15:30 ~ 17:00

- [W2D-1] An End-To-End Deep Learning Model Based on Channel Impulse Response Measurement for 2D Indoor Positioning
Ida Bagus Krishna Yoga Utama, Miftahul Khoir Shilahul Umam and Yeong Min Jang (Kookmin University, Korea (South))
- [W2D-2] Enhancing Drone Communication Utilizing 4QAM OFDM in OCC Systems
Yeong Min Jang, Ones Sanjerico Sitanggang, Herfandi Herfandi and Muhammad Miftah Faridh (Kookmin University, Korea (South))
- [W2D-3] Towards Panoptic Segmentation Integration for SLAM with Unmanned Aerial Vehicle: A Survey
Khairi Hindriyandhito Nurcahyo, Ida Bagus Krishna Yoga Utama, Sang Min Yoon, Sang-Chul Kim and Yeong Min Jang (Kookmin University, Korea (South))
- [W2D-4] An Experimental Demonstration of 2D-MIMO Based Deep Learning for OCC System
Huy Nguyen and Yeong Min Jang (Kookmin University, Korea (South))

July 3, 2024 (Wednesday)

Da Eun Kim, Su Min Kim and Junsu Kim (Tech University of Korea, Korea (South))

Session 1A: AI/ML Applications

Chair: Xiaoyan Wang (Ibaraki University, Japan)

Room B (B404), Time 13:30 ~ 15:00

- [1A-1] **Fusion Between Image Processing and Machine Learning for Dust Detection on Solar Panels**
Mariam Mamdouh and Yasmine Abdalla Zaghoul (German International University, Egypt)
- [1A-2] **Hybrid Horizons: Advancing Water Potability Prediction Through Hybrid Machine Learning**
Jovita Biju (Indian Institute of Science Education and Research Thiruvananthapuram, India); Chetan Badgujar (The University of Tennessee, USA); Alwin Poullose (Indian Institute of Science Education and Research Thiruvananthapuram, India)
- [1A-3] **The Power of Visual Storytelling: Analyzing Customer Personalities with Tableau**
Alwin Poullose and Jadov Menaka (Indian Institute of Science Education and Research Thiruvananthapuram, India)
- [1A-4] **Colorized Latent-Based Conditional Generative Adversarial Network**
Jongjae Lee, Gibum Joung, Dongje Yang and Su Sik Bang (Tech University of Korea, Korea (South))
- [1A-5] **Performance and Inference Time Tradeoff for RNN Model Based Wideband Inter-Radar Interference Mitigation**
Yudai Suzuki and Xiaoyan Wang (Ibaraki University, Japan); Masahiro Umehira (Nanzan University & Ibaraki University, Japan); Ran Sun and Shigeki Takeda (Ibaraki University, Japan)

Session 1B: AI/ML for Mobile Communications

Chair: Su Min Kim (Tech University of Korea, Korea)

Room C (A405), Time 13:30 ~ 15:00

- [1B-1] **Improve Federated Learning Stability for Vehicle Trajectory Prediction**
Youbang Sun (Northeastern University, USA); Jianlin Guo and Kieran Parsons (Mitsubishi Electric Research Laboratories, USA); Yukimasa Nagai (Mitsubishi Electric Corp., Japan)
- [1B-2] **Multi-Modal Sensing-Aided Beam Prediction Using Poolformer for UAV Communications**
Yerin Yeo and Junghyun Kim (Sejong University, Korea (South))
- [1B-3] **DNN-Based Relative Positioning Technique Using RF Ranging**
Seung-mi Yun, In-young Hyun and Eui-Rim Jeong (Hanbat National University, Korea (South))
- [1B-4] **Reinforcement Learning Based Intelligent Reflecting Surface Element Selection Scheme Under Time-Correlated Channel**

Session 1C: B5G and 6G

Chair: Inkyu Bang (Hanbat National University, Korea)

Room D (A406), Time 13:30 ~ 15:00

- [1C-1] **Single-Reflection Point Distribution Estimation for IRS Placement Problem**
Naoki Yamagishi and Takahiro Matsuda (Tokyo Metropolitan University, Japan); Hirofumi Sugauma and Tsutomu Mitsui (Anritsu Corporation, Japan)
- [1C-2] **GRAND Massive Parallel Decoding Framework for Low Latency in Beyond 5G**
Danilo Gligoroski (Norwegian University of Science and Technology, Norway); Sahana Sridhar (Norwegian University of Science and Technology (NTNU), Norway); Katina Kralevska (Norwegian University of Science and Technology, Norway)
- [1C-3] **Energy Efficiency Analysis of DUE 5G Networks**
Chrysostomos Athanasios Katsigiannis (University of Patras, Greece); Apostolos Gkamas (University of Ioannina, Greece); Konstantinos Tsachrelis, Christos J Bouras and Vasileios Kokkinos (University of Patras, Greece); Philippos Poyioutas (University of Nicosia, Cyprus)
- [1C-4] **Simplified Phase Compensation of Baseband Signal for Frequency Conversion in 5G NR Systems**
Youngil Jeon (Electronics and Telecommunications Research Institute, Korea (South)); JunHwan Lee (ETRI, Korea (South))
- [1C-5] **Moving Reconfigurable Intelligent Surfaces: A Promising Frontier for 6G Communications**
Junhyeong Kim, Sung Woo Choi and Heesang Chung (ETRI, Korea (South))

Session 2A: IoT Systems and Applications

Chair: Seokjoo Shin (Chosun University, Korea)

Room B (B404), Time 15:30 ~ 17:00

- [2A-1] **Fast Prototyping of Quantized Neural Networks on an FPGA Edge Computing Device with Brevitas and FINN**
Devansh Chawda (University of Southern Denmark, Denmark); Benaoumeur Senouci (North Dakota State University, USA)
- [2A-2] **Raspberry Pi with Real-Time Kernel**
Won Yong Ha (Binlur)
- [2A-3] **Research on the Design and Implementation of a Mesh Network Communication System for Fire and Hazardous Gas Detection and Response**
Sung-hun Lee, Dong-Cheul Han, Yong-An Jung, Soo-Hyun Cho, Sang-Bong Byun and DongEon Kim (Gumi Electronics & Information Technology Research Institute, Korea (South))

- [2A-4] **Structured Feature-Based Component Architecture Design from a Traceability Perspective**
Insun Yoo and Ki-Yeol Ryu (Ajou University, Korea (South))

Session 2B: IoT for e-Health

Chair: Vincent Peter C Magboo (University of the Philippines Manila, Philippines)

Room C (A405), Time 15:30 ~ 17:00

- [2B-1] **Wind Driven Optimization-Based Power Control Mechanism for Edge-Enabled Body Area Networks**
Haoru Su, Li Zhang, Xiliang Liu and Shaofu Lin (Beijing University of Technology, China)
- [2B-2] **Frequency Utilization Model Formation Methods Using Packet Analysis and Signal Power Detection**
Koudai Yaginuma (University of Shinshu, Japan); Osamu Takyu (Shinshu University, Japan); Takeo Fujii (The University of Electro-Communications, Japan)
- [2B-3] **Feature Selection Techniques Applied to Voice-Based Prediction of Parkinson's Disease**
Vincent Peter C Magboo, Dhone Matthews M. Calibuyot, Emmanuel D. Ednalan, Nathaniel M. Ortega and Ma Sheila A Magboo (University of the Philippines Manila, Philippines)
- [2B-4] **Hybrid Convolutional Neural Networks for PIMA Indians Diabetes Prediction**
Farsana K S and Alwin Poullose (Indian Institute of Science Education and Research Thiruvananthapuram, India)

Session 2C: IoT Networks

Chair: Taehoon Kim (Hanbat National University, Korea)

Room D (A406), Time 15:30 ~ 17:00

- [2C-1] **UxV-Swarm Based Automated Fruits Disease Instance Segmentation for Smart Farming Using Deep Learning Model**
Syed Muhammad Raza (Research Assistant at Kumoh National Institute of Technology, Korea (South)); Md. Masuduzzaman (Postdoctoral Research Fellow at Kumoh National Institute of Technology, South Korea, Korea (South)); Soo Young Shin (Kumoh National Institute of Technology, Korea (South))
- [2C-2] **Cell Allocation Method for Scalability Enhancement in TSCH Autonomous Scheduling**
Hee-Jun Lee and Sang-Hwa Chung (Pusan National University, Korea (South))
- [2C-3] **Pairing Strategy for Using Multiple Channels in Minimal Cell of 6TiSCH Network**
Jeongbae Park and Sang-Hwa Chung (Pusan National University, Korea (South))
- [2C-4] **Dynamic Cell Scheduling Technique Based on Packet Queue Utilization in 6TiSCH Networks**

Jehyeong Lee and Sang-Hwa Chung (Pusan National University, Korea (South))

- [2C-5] **On the Secrecy Sum-Rate of Uplink Multiuser Networks with Potential Eavesdroppers**

Inkyu Bang (Hanbat National University, Korea (South)); Seong Ho Chae (Tech University of Korea, Korea (South)); Bang Chul Jung (Chungnam National University, Korea (South))

July 4, 2024 (Thursday)

Session 3A: Big Data and Computing

Chair: Jung Hoon Lee (Hankuk University of Foreign Studies, Korea)

Room B (B404), Time 13:30 ~ 15:00

- [3A-1] **Fast Personalized PageRank for Customized Analysis Range Using Static Index**
Tsuyoshi Yamashita and Kunitake Kaneko (Keio University, Japan)
- [3A-2] **User Localization with HRIS and Backscatter Modulation for Next-Generation Networks**
Mattia Piana and Stefano Tomasin (University of Padova, Italy)
- [3A-3] **Enhancing Nanophotonic Device Inverse Design Through a Class Conditional Generative Adversarial Network with Integrated Classifier on StyleGAN2-ADA Framework**
Chanho Gu, Sun Jae Baek and Minhyeok Lee (Chung-Ang University, Korea (South))
- [3A-4] **A Word-Axis Speaker Embedding Trained with Multi-Speaker Analysis Task**
Jio Gim (Pohang University of Science and Technology, Korea (South)); Younho Nam (Postech, Korea (South)); Hyojin Kim (POSTECH, Korea (South)); Young-Joo Suh (Pohang University of Science and Technology (POSTECH), Korea (South))

Session 3B: Social Networks and Security

Chair: Nadav Voloch (IMT School of Advanced Studies, Italy)

Room C (A405), Time 13:30 ~ 15:00

- [3B-1] **The Sentiment of Fake News**
Nadav Voloch (IMT School of Advanced Studies, Lucca, Italy); Marinella Petrocchi (CNR-IIT, Italy); Rocco De Nicola (IMT Advanced Studies Lucca, Italy)
- [3B-2] **Malware Detection Using Anomaly Detection Algorithms**
Attallah Burro (Ca' Foscari University of Venice, Italy); Arslan Rafi (Center for Cybersecurity FBK Trento, Italy); Muhammad Azfar Yaqoob (Free University of Bolzano Bolzano Italy, Italy); Flaminia Luccio (Universita Ca' Foscari Venezia, Italy)
- [3B-3] **Improving Hierarchical Tree-Based Packet Classification by Reinforcement Learning**
Zhi-Xing Ou (National Cheng Kung University, Taiwan); Wen-Chi Shih

(Email, Taiwan); Tsung-Yu Hsieh and Yeim-Kuan Chang (National Cheng Kung University, Taiwan)

- [3B-4] **A Novel IoT Middleware for Secure Pharmaceuticals Condition Monitoring in Supply Chain**
Osama Ishmilh, Muhammad Aslam Jarwar, Yasir Javed Sheffield Hallam University, United Kingdom (Great Britain)

Session 3C: QoS and QoE

Chair: Truong Thu Huong (Hanoi University of Science and Technology, Vietnam)

Rooms D (A406), Time 13:30 ~ 15:00

- [3C-1] **Data-Driven Video Scene Importance Estimation for Adaptive Video Streaming**
Wangyu Choi and Jongwon Yoon (Hanyang University, Korea (South))
- [3C-2] **Quantitative Evaluation of Effect of FP on QoS Controls in IEEE 802.1TSN over In-Vehicle Networks by Multiple Regression Analysis**
Akari Yoshimura, Kaori Iwata and Yoshihiro Ito (Nagoya Institute of Technology, Japan)
- [3C-3] **A Study on Determination of an Appropriate GCL of Time-Aware Shaper in Ethernet-Based Industrial Networks**
Akari Yoshimura and Yoshihiro Ito (Nagoya Institute of Technology, Japan)
- [3C-4] **Efficient Short-Form Video Streaming: An Integration of Dynamic Bitrate Adaptation and Predictive Segment Preloading**
Lich Hong Nguyen (VinUNI, Vietnam); Huong Thu Truong (Hanoi University of Science and Technology, Vietnam); Nguyen Viet Hung (East Asia University of Technology, Vietnam); Nam Pham Ngoc (VinUniversity, Vietnam)
- [3C-5] **A Benchmark on Artificial Neural Networks and Embedded Targets Couples Adequacy**
Julien Beloin and Louis Bonicel (KNDS, France); Philippe Millet (Nexter Systems, France)

Session 4A: Programmable Networks

Chair: Sangheon Park (Korea University, Korea)

Room B (B404), Time 15:30 ~ 17:00

- [4A-1] **An Improved Network Coding-Based Secret Sharing Scheme on Programmable Switches**
Jun-You Xu, Shih-Lung Liang, Hao-Yang Lin and Yeim-Kuan Chang (National Cheng Kung University, Taiwan)
- [4A-2] **A Novel Technique to Improve Scalability in SRv6-Based Networks**
Akos Leiter and Pal Boosy (Nokia Bell Labs, Hungary); Laszlo Bokor (Budapest University of Technology and Economics, Hungary)
- [4A-3] **ROBUST-6G: Smart, Automated, and Reliable Security Service Platform for 6G**

Bartłomiej Siniarski, Chamara Sandeepa, Shen Wang and Madhusanka Liyanage (University College Dublin, Ireland); Cem Ayyildiz and Veli Can Yildirim (GÖHM, Turkey); Hakan Alakoca (Ericsson Research, Turkey); Gunes Kesik and Betül Güvenç Paltun (Ericsson, Turkey); Giovanni Perin, Michele Rossi and Stefano Tomasin (University of Padova, Italy); Arsenia Chorti (ETIS UMR 8051, CY University, ENSEA, CNRS & ETIS, France); Pietro Giardina (Nextworks, Italy); Alberto García Pérez and José M. Jorquera Valero (University of Murcia, Spain); Tommy Svensson (Chalmers University of Technology, Sweden); Nikolaos Pappas (Linköping University, Sweden); Marios Kountouris (University of Granada, Spain & EURECOM, France)

- [4A-4] **A Performance Evaluation Method Based on Virtualization Architecture**
Ye Yongjun, Changyong Pan and Chao Zhang (Tsinghua University, China)
- [4A-5] **AirFogComp: Over-The-Air-Fog Computation for Federated Learning over Fog-RAN**
Eunhyuk Park and Seok-Hwan Park (Jeonbuk National University, Korea (South))

Session 4B: V2X Communications

Chair: Dongkyun Kim (Kyungpook National University, Korea)

Room C (A405), Time 15:30 ~ 17:00

- [4B-1] **Reliable Message Exchange for Cooperative Autonomous Driving in 3GPP C-V2X Networks**
Tse-Jui Chang and Meng-Shiuan Pan (National Taipei University of Technology, Taiwan)
- [4B-2] **Enhancing V2X Communication: Machine Learning Assisted Dynamic mmWave Beam Search**
Ryo Iwaki and Jin Nakazato (The University of Tokyo, Japan); Kazuki Maruta (Tokyo University of Science, Japan); Manabu Tsukada (the University of Tokyo, Japan); Hideya Ochiai and Hiroshi Esaki (The University of Tokyo, Japan)
- [4B-3] **Federated Learning mmWave Beamforming for V2X Communications with Imperfect CSI and Doppler Shift**
Sanjay Bhardwaj (Kumoh National Institute of Technology & ICT Convergence Research Center, Korea (South)); Dong Seong Kim (Kumoh National Institute of Technology, Korea (South))
- [4B-4] **Deep Reinforcement Learning-Based Edge Discovery Within the 3GPP Framework for C-ITS**
Malik Saad, Muhammad Ashar Tariq, Mahnoor Ajmal and Donghyun Jeon (Kyungpook National University, Korea (South)); Jinhong Kim (ETRI, Korea (South)); Kil-Taek Lim (Electronics and Telecommunications Research Institute, Korea (South)); Jang Woon Baek (ETRI, Korea (South)); Dongkyun Kim (Kyungpook National University, Korea (South))

Session 4C: Wireless Communications

Chair: Hiroyuki Otsuka (Kogakuin University, Japan)

Rooms D (A406), Time 15:30 ~ 17:00

- [4C-1] Classification of Analog Modulated Signals Using Convolutional Neural Networks
Bo-Seok Seo, Yeam-Gui Yi and Kang Solsong (Chungbuk National University, Korea (South))
- [4C-2] Consideration of Frequency Domain Adaptive SIC for Full-Duplex Communication
Kazuma Matsushima, Takumi Yasaka and Hiroyuki Otsuka (Kogakuin University, Japan)
- [4C-3] MUSIC-Based Channel Estimation with Adaptive Reconfiguration of Diagonal RIS
Yaser Dorrazehi, Anna Guglielmi and Stefano Tomasin (University of Padova, Italy)
- [4C-4] Design Flexibility of Picocells in HetNets with Respect to Number of Picocell-Sectors
Naoto Inagaki and Hiroyuki Otsuka (Kogakuin University, Japan)
- [4C-5] Joint Optimization of Task Splitting and Cell-Free MIMO Transmission for Multi-Tier Computing Systems
Dogon Kim and Seok-Hwan Park (Jeonbuk National University, Korea (South))

July 5, 2024 (Friday)

Session 5A: Satellite Networks

Chair: Jihwan Moon (Hanbat National University, Korea)

Room B (B404), Time 9:30 ~ 11:00

- [5A-1] Energy Efficiency Maximization for Multi-LEO Satellite Networks
Jihwan Moon (Hanbat National University, Korea (South)); Hoon Lee (Ulsan National Institute Science and Technology, Korea (South))
- [5A-2] Machine Learning-Based NOMA in LEO Satellite Communication Systems
Min Jeong Kang and Jung Hoon Lee (Hankuk University of Foreign Studies, Korea (South)); Seong Ho Chae (Tech University of Korea, Korea (South))
- [5A-3] Analysis of LEO Satellite Network Performance According to Phasing Factor: Polar Region Boundary, Minimum Elevation Angle
Heon-Woo Chu (University of Ajou, Korea (South)); Tae-Yoon Kim (Ajou University, Korea (South)); Jae-Hyun Kim (Ajou University, South Korea, Korea (South))

Session 5B: UAV Mobility

Chair: Masoud Ardakani (University of Alberta, Canada)

Room C (A405), Time 9:30 ~ 11:00

- [5B-1] Group-Wise Coding for Coded Distributed Computing Systems with Group Heterogeneity and Communication Delay
Maryam Ardakani and Masoud Ardakani (University of Alberta, Canada); Chintha Tellambura (The University of Alberta, Canada)
- [5B-2] Horizontal Soft Handover Management in Cell-Free Massive MIMO Networks
Murad Khan, Basil Allothman and Chibli C. Joumaa (Kuwait College of Science and Technology, Kuwait); Dongkyun Kim (Kyungpook National University, Korea (South))
- [5B-3] Investigating Robustness of Trainable Activation Functions for End-To-End Deep Learning Model in Autonomous Vehicles
Ahmed D. M. Ibrahim, Manzoor Hussain, Zhengyu Shang and Jang-Eui Hong (Chungbuk National University, Korea (South))
- [5B-4] GRU-Based MCS Selection for UAV Communication in 5G Environment
Woong Jong Yun, Seok Jin Hong and Eui-Rim Jeong (Hanbat National University, Korea (South))

Session 5C: Radio Resource Management

Chair: Sangheon Park (Korea University, Korea)

Rooms D (A406), Time 9:30 ~ 11:00

- [5C-1] Data Acquisition and Visualization for AI/ML-Based Radio Resource Management Optimization in the ns-0-RAN Framework
Seung-Eun Hong (ETRI, Korea (South)); Jung Mo Moon (Electronics and Telecommunications Research Institute, Korea (South)); Jaewook Lee (Pukyong National University, Korea (South))
- [5C-2] ARQ Delay in Underwater Acoustic Communications
Andrej Stefanov (IBU Skopje, Macedonia, the former Yugoslav Republic of)
- [5C-3] PAPR Reduction for OTFS Signals Based on Time-Domain Window
Huang Chang Lee (Chang Gung University, Taiwan)
- [5C-4] Chirp Index Space Partitioning Based Multiple Access Technique
Hinata Sakamoto and Koichi Adachi (The University of Electro-Communications, Japan)

July 3, 2024 (Wednesday)

Poster Session 1

Lobby, Time 15:30 ~ 17:00

- [P1-1] **Integrated Optimization Algorithm for Secrecy Rate Improvement in UAV-RIS Enabled System**
Seungseok Sin, Yuna Sim and Jina Ma (Chonnam National University, Korea (South)); Kyunam Kim (Alps Electric Korea Company Limited, Korea (South)); Huaping Liu (Oregon State University, USA); Sangmi Moon (Korea Nazarene University, Korea (South)); Intae Hwang (Chonnam National University, Korea (South))
- [P1-2] **Improving the Error Performance and Sum Rate of NOMA System by Applying Encoding and Decoding Scheme with XOR Bit Operation**
Sang-Wook Park, Hyoung-Do Kim, Ji-Hee Yu, Seong-Gyun Choi and Hyoung-Kyu Song (Sejong University, Korea (South))
- [P1-3] **Multi-Agent Deep Reinforcement Learning-Based Multi-UAV Path Planning for Wireless Data Collection and Energy Transfer**
Chungnyeong Lee and Sangcheol Lee (Tech University of Korea, Korea (South)); Taehoon Kim and Inkyu Bang (Hanbat National University, Korea (South)); Jung Hoon Lee (Hankuk University of Foreign Studies, Korea (South)); Seong Ho Chae (Tech University of Korea, Korea (South))
- [P1-4] **Analysis of GRU-Based Platform to Prevent the Accident from Lonely Death**
Sung Hyun Oh (Tech University of Korea, Korea (South)); Jeong Gon Kim (Korea Polytechnic University, Korea (South))
- [P1-5] **Inter-Cell Offloading with Capacity and Coverage Optimization in Heterogeneous Network**
Donghyuk Gwak (Electronics and Telecommunications Research Institute, Korea (South)); Jeehyeon Na (ETRI, Korea (South))
- [P1-6] **Design of User Behavior-Aware Video Chunk Caching Strategy at Network Edge**
A-Hyun Lee and Taewook Ko (Seoul National University, Korea (South)); Chong-Kwon Kim (Korea Institute of Energy Technology, Korea (South))
- [P1-7] **Research on Digital Cultural Heritage Expansion Using AI Technology**
Chan-woo Park and Hee-Kwon Kim (Electronics and Telecommunications Research Institute, Korea (South)); Jae-Ho Lee (Electronics and Telecommunications Research Institute: ETRI, Korea (South))
- [P1-8] **Comparative Evaluation of Network-Based Intrusion Detection: Deep Learning Vs Traditional Machine Learning Approach**
Miracle Udurume, Vladimir V. Shakhov and Insoo Koo (University of Ulsan, Korea (South))
- [P1-9] **Design of Underwater Communication Modulation**

and Demodulation Technology for High-Performance Underwater Acoustic Modem

Taegeon Chung and Kang-Hoon Choi (LIG Nex1, Korea (South)); Kwangyoung Chae and Tae-Ho Im (Hoseo University, Korea (South))

- [P1-10] **Beamforming Vector Optimization Algorithm in RIS Based Non-Terrestrial Systems**
Yuna Sim, Seungseok Sin and Jina Ma (Chonnam National University, Korea (South)); Kyunam Kim (Alps Electric Korea Company Limited, Korea (South)); Huaping Liu (Oregon State University, USA); Sangmi Moon (Korea Nazarene University, Korea (South)); Intae Hwang (Chonnam National University, Korea (South))
- [P1-11] **A Real-Time Design of Stereo Vision System Using Disparity Calibration**
Tae-Geun Park, Gi-Duk Suh, Jun-Beom Lim and Seung-Ha Jeong (The Catholic University of Korea, Korea (South))
- [P1-12] **Performance Evaluation of Two-Step Random Access for Low-Latency Communications in 6G**
Taehoon Kim (Hanbat National University, Korea (South)); Seong Ho Chae (Tech University of Korea, Korea (South)); Inkyu Bang (Hanbat National University, Korea (South))
- [P1-13] **Simulation Design for Learning Data Collection to Estimate UAM Location in GNSS-Denied Using 3D Spatial Information**
HyeonJoong Wi (University of Science and Technology, Korea (South)); Insung Jang (Electronics and Telecommunications Research Institute, Korea (South)); Sang Gi Hong (Electronics and Telecommunication Research Institute, Korea (South))

July 4, 2024 (Thursday)

Poster Session 2

Lobby, Time 13:30 ~ 15:00

- [P2-1] **A Study on Low Power Wide Area Communication-Based Multi-Sensing Technology for Smart Agriculture**
Taehyun Kim, Jeonghyun Baek and DongHyeok Im (National Institute of Agricultural Sciences, Korea (South))
- [P2-2] **A Study on Integrating HRRC Network for Robust CVR Solutions**
Sungsoo Choi (Korea Electrotechnology Research Institute, Korea (South)); Jimyung Kang (Korea ElectroTechnology Research Institute, Korea (South))
- [P2-3] **Strategic Insights in Korean-English Translation: Cost, Latency, and Quality Assessed Through Large Language Model**
Seungyun Baek (Korea University, Korea (South)); Seunghwan Lee (Korea University & Complex Data Analytics Lab, Korea (South)); Junhee Seok (Korea University, Korea (South))

- [P2-4] **Transmittance-Based Classification of Semiconductor Slit Designs: A Novel MLP Approach**
Seoyoung Sim, Jangwon Seo, Noori Yun and Junhee Seok (Korea University, Korea (South))
- [P2-5] **A Moving Object Tracking in Video Sequences Using Finite Memory Structure Filter**
Pyung Soo Kim (Tech University of Korea, Korea (South))
- [P2-6] **Blind Detection of Channel Coding and Interleaving Using Convolutional Neural Networks in Tactical Communications**
Seok Jin Hong, Woong Jong Yun and Eui-Rim Jeong (Hanbat National University, Korea (South))
- [P2-7] **FFT-Based Narrowband Interference Cancellation in SC-FDE Systems**
In-young Hyun, Seung-mi Yun and Eui-Rim Jeong (Hanbat National University, Korea (South)); Oh Hyuk Jun (Kwangwoon University, Korea (South))
- [P2-8] **Design of an ECG Stream Analysis Framework Based on FHIR Data Model**
Junghoon Lee (Jeju University, Korea (South)); Jinhyang Kim (Seers Technology, Korea (South))
- [P2-9] **A Data-Gathering Underwater Medium Access Control Scheme Using Carrier Sensing Associated Machine Learning**
Jong-Won Lee, Shin-Young Park, Eun-Ju Do and Ho-Shin Cho (Kyungpook National University, Korea (South))
- [P2-10] **Hybrid Random Routing Protocol to Enhance the Performance of Routing Protocol in Source Location Privacy Using Ant Colony Optimization and Random Walk**
Iftekhharul Islam Shovon and Seokjoo Shin (Chosun University, Korea (South))
- [P2-11] **Implementation of Multifaceted Safety Indicators-Based Battery Protection System for Battery Faults and Failures**
Changwoo Kim and Jin Won Park (Korea Electronics Technology Institute, Korea (South)); TAEIL YUN (KETI, Korea (South)); Hyo-Sub Choi (Korea Electronics Technology Institute, Korea (South))
- [P2-12] **Machine Learning Based Sink Node Positioning for Lifetime Extension of Multihop Wireless Sensor Network**
Jihye Song, Gyoungmin Been, Su Min Kim and Junsu Kim (Tech University of Korea, Korea (South))
- [P2-13] **Implementation of Root Zone Management System Utilizing Predictive Modlling for Optimized Nutrient Solution Supply in Hydroponic Floriculture**
Jeonghyun Baek and Youngsin Hong (National Institute of Agricultural Sciences, Korea (South)); Manjung Kim (National Institute of Agricultural Science, RDA, Korea (South))
- Poster Session 3**
Lobby, Time 15:30 ~ 17:00
- [P3-1] **Towards Data Quality Standardization for Electricity AMI Data Platform in Housing**
Eunbi Ko (Telecommunications Technology Association, Korea (South)); GukSik Jeong (TTA & Telecommunications Technology Association, Korea (South))
- [P3-2] **Standardization Challenge and Opportunity for Electricity AMI Data Platform in Housing**
Eunbi Ko (Telecommunications Technology Association, Korea (South)); GukSik Jeong (TTA & Telecommunications Technology Association, Korea (South))
- [P3-3] **Chirp-Based Frequency Shift Keying for Underwater Acoustic Communications**
Jin won Kim, Bo Geun SEO and Sangman Han (Hoseo University, Korea (South)); Kiha Cho (Hoseo University, Korea (South)); Hak-Lim Ko and Hojun Lee (Hoseo University, Korea (South))
- [P3-4] **Medical Healthcare Digital Twin Reference Platform**
KangYoon Lee (Gachon University, Korea (South))
- [P3-5] **A Preliminary Study on an Intrusion Detection Method Using Large Language Models in Industrial Control Systems**
seokhyun Ann and Seong-je Cho (Dankook University, Korea (South)); Hongeun Kim (Dongkuk University, Korea (South))
- [P3-6] **Contents Scene Extraction Based on Distance Matrix**
Hyok Song and Min-Soo Ko (Korea Electronics Technology Institute, Korea (South)); Jisang Yoo (Kwangwoon University, Korea (South))
- [P3-7] **Energy Surplus Power Trading and Sharing Service Platform for Housing Complexes**
Tai Yeon Ku and Wan-Ki Park (ETRI, Korea (South)); Hoon Choi (Chungnam National University, Korea (South))
- [P3-8] **Huge Content Data Management in the Museum for Numerous Applications**
Jae-Ho Lee (Electronics and Telecommunications Research Institute: ETRI, Korea (South)); Chan-woo Park and Hee-Kwon Kim (Electronics and Telecommunications Research Institute, Korea (South))
- [P3-9] **A Wilkinson Divider Having Selective Function of Power Divider or Balun**
Jongsik Lim, Dal Ahn and Sang Min Han (Soonchunhyang University, Korea (South)); Gil Young Lee (The Ohio State University, USA)
- [P3-10] **Generative AI for the Maritime Environments**
Pradeep Reddy Gogulamudi (Kookmin University, Korea (South)); Shrutika Sinha (Kookmin University, Seoul, South Korea, Korea (South)); Soo-Hyun Park (Kookmin University, Korea (South))
- [P3-11] **Experimental Deployment of Internet of Fishery Things (IoFT) for Healthy Oceans**
Kiseon Kim (GIST - Gwangju, Reoublic of Korea, Korea (South))

- [P3-12] **Deep Learning-Based Low-Complexity Channel Impulse Response Estimation for Resource Management of Underwater Communication Network**
SeungHwan Seol, Yongcheol Kim, Minho Kim and Jaehak Chung (Inha University, Korea (South))
- [P3-13] **A Reinforcement Learning-Based Energy Efficiency Improvement Scheme for a Joint Communication and Radar System with Multiple UAVs**
Youn Joo Song, Junsu Kim and Su Min Kim (Tech University of Korea, Korea (South))
- [P3-14] **Design of Manufacturing Equipment Digital Twin Interworking Framework Based on REST API for Smart Factory**
JungWook Wee, Minju Cho, Youn-Sung Lee and Kyung-Taek Lee (Korea Electronics Technology Institute, Korea (South))
- [P3-15] **Low-Power BLACK-ICE Detection for Safety Critical Edge Devices on Roads**
Mohammadreza Najafi, Saeid Gorgin, Mohammad K Fallah, Ghassem Jaberipur and Jeong-A Lee (Chosun University, Korea (South))
- [P4-5] **Emotion Recognition in Images and Video with Python for Autism Assessment**
Jaejoon Kim (Daegu University, Korea (South)); Julian Hunt (Murray State University, USA)
- [P4-6] **PathoVoiceAI: Classifying Pathology Types in Human Voices**
Srinidhi Kanagachalam and Deok-Hwan Kim (Inha University, Korea (South))
- [P4-7] **Semantic Communications - A Comprehensive Survey for Future Research Issues**
Su-Jin Lee and Ye Hoon Lee (Seoul National University of Science and Technology, Korea (South))
- [P4-8] **Exploring the Cinemaverse: Data-Driven Analysis of Movie Production, Revenue, and Trends Using Tableau Visualization Tool**
Govindram Neware, John Paul, Alwin Poullose (Indian Institute of Science Education and Research Thiruvananthapuram, India)

July 5, 2024 (Friday)

Poster Session 4

Lobby, Time 9:30 ~ 11:00

- [P4-1] **Precise and Stable Indoor Positioning with Signal Variations**
Junhaeng Lee (University of Science and Technology & Electronics and Telecommunications Research Institute, Korea (South)); Jaejun Yoo (Electronics and Telecommunication Research Institute, Korea (South)); Kyongho Kim (ETRI, Korea (South))
- [P4-2] **A Sink-Triggered Data Gathering Protocol in Underwater Sensor Network**
Shin-Young Park, Eun-Ju Do, Jong-Won Lee and Ho-Shin Cho (Kyungpook National University, Korea (South))
- [P4-3] **Multiple Diversity Using Acoustic Vector Receiver for Shallow-Water Acoustic Communication**
Kang-Hoon Choi (LIG Nex1, Korea (South)); Jee Woong Choi (Hanyang, Korea (South)); Sunhyo Kim (Korea Institute of Ocean Science and Technology, Korea (South)); Taegeon Chung (LIG Nex1, Korea (South))
- [P4-4] **Analysis of Interference Effects in a Hybrid Frequency Usage Environment Between Aerial and Terrestrial Networks**
Seung-Woo Jo and Won Cheol Lee (Soongsil University, Korea (South))

BME O Building

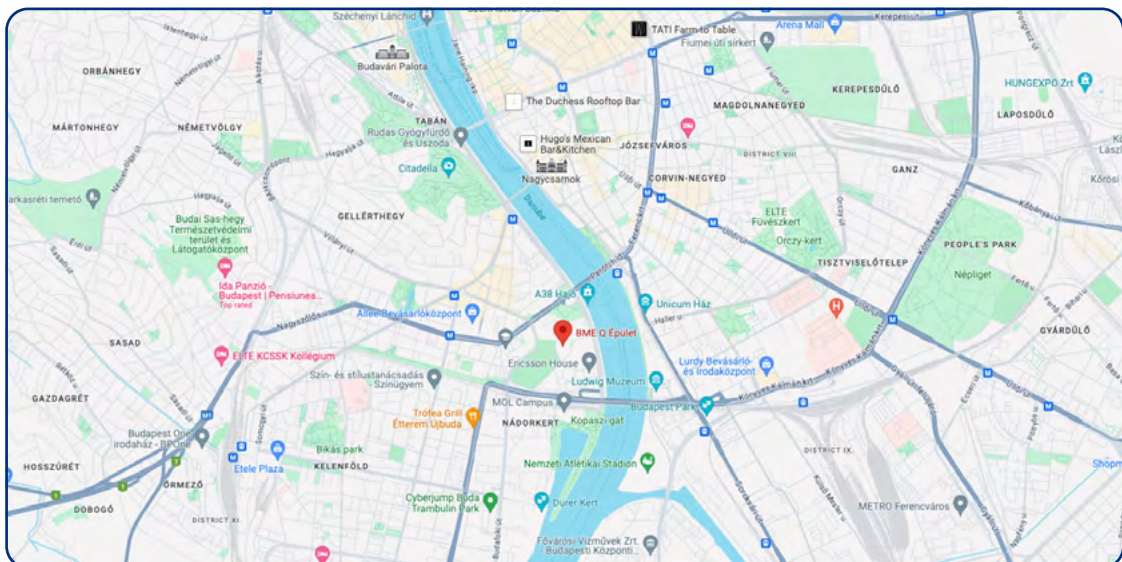
Address

Budapest, Magyar tudósok krt. 2, 1117 Hungary

Introduction

More than 110 departments and institutes operate within the structure of eight faculties. About 1100 lecturers, 400 researchers and other degree holders and numerous invited lecturers and practising expert specialists participate in education and research at the Budapest University of Technology and Economics. More than 10% of 21.000 degree seeking students are from abroad, representing more the 50 countries. The Budapest University of Technology and Economics issues about 70% of Hungary's MSc degrees in engineering. The campus of the Budapest University of Technology and Economics is located in the heart of Budapest – within easy reach of ample housing facilities, public services, historic sights and recreational facilities –, but it still provides a peaceful environment suitable for intense study and research.

Map



Budapest Parliament

The Hungarian Parliament, also known as the Budapest Parliament, has become one of the city's main symbols. It is also one of the best-known structures in Europe. It is the third largest assembly building in the world, after the Parliament of Romania and the National Congress of Argentina.

Constructed between 1884 and 1902, the seat of the National Assembly of Hungary was the biggest building of its time. It has 691 rooms and is 879 ft (268 m) long and 404 ft (123 m) wide.

The vastness of the Parliament was a sign of the economic power of Hungary at the beginning of the twentieth century.



Széchenyi Thermal Bath

Széchenyi Thermal Bath is the largest natural hot spring spa in Budapest and Europe. The neogothic-styled bath was opened in 1913.

This spa has over 15 pools; 3 of them are large outdoor swimming pools and the rest are smaller and indoors. There are also various saunas, steam chambers, and rooms where you can get different types of massages.

The most impressive bath units are located outdoors. One of the best experiences is to be in one of the open-air thermal water pools heated at 37°C (98°F) in the middle of winter when it is below freezing. (The moment of getting out of the pool is also unforgettable!)



Buda Castle

Buda Castle is a remarkable castle and one of Budapest and Hungary's most magnificent symbols, along with the Chain Bridge to which it is linked. Nowadays, Buda Castle houses the National Széchényi Library, the Budapest History Museum and the Hungarian National Gallery.

The imposing Buda Castle sits at the top of Castle Hill and offers an impressive panoramic view over Pest and the river. The views are very similar to those from Fisherman's Bastion. And being connected to the Chain Bridge, the palace complex is breathtaking at night when the overpass and the Castle are lit up.



As well as visiting the Palace, we also recommend getting lost in the Castle Hill's narrow streets and alleyways.

Chain Bridge

Before the iron structure was built, the Danube river could only be crossed by boat or by foot when the waterway would freeze over during winter.

The Chain Bridge was commissioned principally because it was extremely difficult for the boats to cross the river during the coldest months and Buda and Pest needed to be more easily connected.

The Chain Bridge took twenty years to build and was inaugurated on 20 November 1849, even before Budapest became a single city.



Fisherman's Bastion

The neo-Gothic and neo-Romanesque structure took nearly twenty years to complete. It was opened to the public in 1902. The terrace has seven towers that represent the seven Magyar tribes that founded Hungary and the bastion houses an equestrian statue of Stephen I.

Budapest Opera House

The structure was built between 1875 and 1884 and the Emperor Franz Joseph I of Austria-Hungary funded the construction with one condition, that it should not be larger than the Vienna State Opera House. The Budapest Opera House currently seats 1,261 people.

The building's façade is decorated with striking sculptures of famous musicians and composers.



Heroes' Square

Hősök tere (Heroes' Square) is one of the main squares in Budapest. It houses one of the city's iconic symbols, the Millennium Memorial, which includes the seven chieftains of the Magyar tribes that founded Hungary and other important heads of state. In between the statues is a large column crowned by Archangel Gabriel.

The square lies at the end of Andrásy Avenue, one of the city's most important boulevards. The plaza and Andrásy Avenue were both recognized as World Heritage Sites in 2002.

The most emblematic building in Heroes' Square is the Museum of Fine Arts, one of the best museums in Budapest.



St. Stephen's Basilica

The Name of St. Stephen's Basilica was given this name in memory of Stephen I of Hungary (975-1038), the country's first king. The temple houses the Holy Right Hand of St. Stephen, one of Hungary's most sacred relics.

The dimensions of the church are extremely impressive; it is 180 ft (55 m) wide and 285 ft (87 m) long. The dome stands 314 ft (96 m) tall, making it the highest classical building in Hungary's capital, along with the Hungarian Parliament building.



The construction of St. Stephen's Basilica was completed in 1905. It took over half a century to build, partly because the dome collapsed in 1868, due to inadequate construction works.

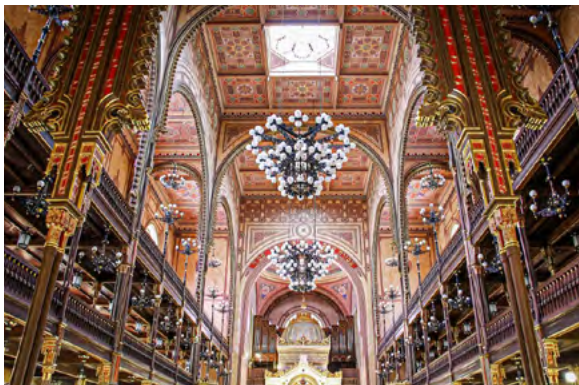
Climbing to the top of the towers

Visitors can climb to the top of the church's right tower, where there is an impressive observation deck with beautiful views over Budapest.

Central Market Hall

The Great Market Hall, also known as the Central Market Hall, is the largest and oldest of the five indoor markets established in Budapest.

At the end of the nineteenth century, indoor markets were founded in Hungary's capital to guarantee the quality of the foodstuff and to prevent food-related illnesses in the overcrowded capital by improving hygienic conditions and enforcing food quality control.



Great Synagogue

The Great Synagogue of Budapest is the largest working synagogue in Europe and the third largest in the world (after the great synagogues of Jerusalem and New York).

The synagogue was built between 1854 and 1859. It was designed by the Austrian architect Ludwig Forster. It's predominantly Neo-Moorish in style, although it also influenced by Byzantine, Gothic, and Romanesque styles. It's 53 m high and 26 m wide and can seat up to 2,964 people, of which 1,492 are men and 1,472

are women. The Synagogue is also called Tabakgasse Synagogue, the Great Synagogue or Dohány Street Synagogue. (Tabakgasse is the German equivalent of Dohány street.)

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