

Workshop Program Book

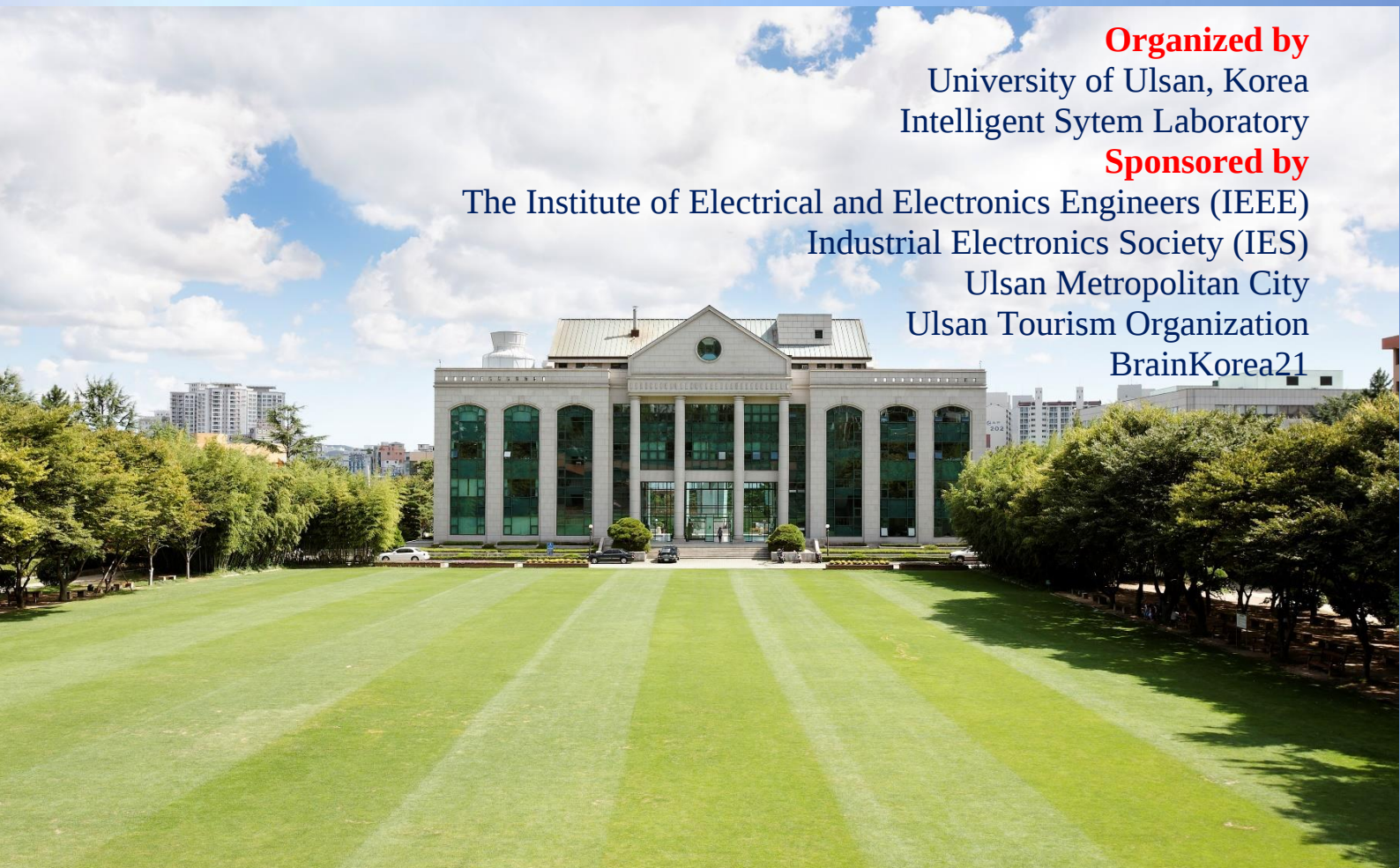
The 2nd International Workshop on Intelligent Systems (IWIS 2022)

Organized by

University of Ulsan, Korea
Intelligent Sytem Laboratory

Sponsored by

The Institute of Electrical and Electronics Engineers (IEEE)
Industrial Electronics Society (IES)
Ulsan Metropolitan City
Ulsan Tourism Organization
BrainKorea21



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IWIS 2022 Welcome Message

Dear Authors, Invitees, and Delegates,

Welcome to IWIS 2022, the 2nd International Workshop on Intelligent Systems in 2022 will be held onsite. The conference is organized by the University of Ulsan and is technically co-sponsored by IEEE Industrial Electronics Society.

We would like to express our sincere appreciation and acknowledgement to the attending authors and the distinguished plenary speakers. The innovative and inspiring plenary lectures are given by Dr. Daesoon Kim from Korea Shipbuilding and Offshore Engineering (Korea) and Prof. Yousef Ibrahim from Federation University Australia (Australia).

We hope you would enjoy the academic discussions and the cultural environment at the highly industrial city of Ulsan.

IWIS 2022 General Co-chairs



Prof. Kang-Hyun Jo
*University of Ulsan,
Korea*



Prof. Yoshinori Kuno
*Saitama University,
Japan*



Kim Fung Man
*City University of Hong Kong,
Hong Kong*

Conference Organization

Honorary Members

Yoshiaki Shirai (University of Picardie, France)
Bogdan M. Wilamowski (Auburn University, USA)

General Chairs

Kang-Hyun Jo (University of Ulsan, Korea)
Yoshinori Kuno (Saitama University, Japan)
Kim F. Man (City University of Hong Kong, Hong Kong)

Program Chairs

Youngsoo Suh (University of Ulsan, Korea)
Nobutaka Shimada (Ritsumeikan University, Japan)
Kim Fung Tsang (City University of Hong Kong, Hong Kong)

International Program Committee Members

Yousef Ibrahim (Federation University Australia, Australia)
Danilo Cáceres Hernandez (Universidad Tecnológica de Panama, Panama)
Kaushik Deb (Chittagong University of Engineering & Technology, Bangladesh)
Wahyono (Universitas Gadjah Mada , Indonesia)
Agus Harjoko (Universitas Gadjah Mada , Indonesia)
Joko Hariyono (Universitas Sebelas Maret, Indonesia)
Alexander Filonenko (IREX, Russia)
Andrey Vavilin (ABBY, Russia)
My Ha Le (Ho Chi Minh City University of Technology and Education, Vietnam)
Van Dung Hoang (Ho Chi Minh City University of Technology and Education, Vietnam)
Hoan Hon Trinh, Vietnam
De-Shuang Huang (Institute of Machine Learning and Systems Biology Tongji University, China)
Laurent Heutte (University of Rouen, France)
Jalil Abbas-Turki, France
Chengbin Ma (University of Michigan-Shanghai Jiao Tong University Joint Institute, China)
Harry H. Gu, USA
Jinhua She (Tokyo University of Technology, Japan)
Sehoon Oh (DGIST, Korea)
Yang Shi (University of Victoria, Canada)
Valeriy Vyatkin (Luleå University of Technology, Finland)
Takashi Yoshimi (Shibaura Institute of Technology, Japan)
Laksono Kurnianggoro, Indonesia
Van Thanh Hoang (Quang Binh University, Vietnam)
Li-Hua Wen, China

Local Arrangement and Registration Chairs

Hyun-Deok Kang (Ulsan National Institute of Science and Technology, Korea)
Taeho Kim (FuturIST, Korea)
Youlkyeong Lee (University of Ulsan, CodePro Inc., Korea)

ISLab Members (University of Ulsan, Korea)

Qing Tang, Duy-Linh Nguyen, Muhamad Dwisnanto Putro, Xuan-Thuy Vo, Tien-Dat Tran, Jinsu Ahn, Jewhan Choi, Junmyeong Kim
Adri Priadana, Seongbo Ha, Seongmin Kim

International Technical Committees (Reviewers)

Kang-Hyun Jo	Kandappan Balasub	Joko Hariyono
Burkhard Wuensche	Hyun-Deok Kang	Seo Dongwook
Catur Atmaji	Tomasz Kocejko	Sukma Pamungkas
Yuen Kiat Cheong	Krzysztof Goczy	Sumalee Chaijaroen
Dalin Zhou	Yoshinori Kuno	Sunu Wibirama
Danilo Hernandez	Laksono Kurnianggoro	Hoang Van Thanh
Van Dung Hoang	Hiroki Kurumatani	Wahyono
Alexander Filonenko	Anugrah Pamosoaji	Youngsoo Suh
Hafiziani Eka Putri	Yang Yu	
Ajmal Shahbaz		

Program Schedule

IWIS2022 – PROGRAM OVERVIEW			
Time	First Day Wednesday Aug. 17 2022	Second Day Thursday Aug. 18 2022	Third Day Friday Aug. 19 2022
09:00 – 10:00	Registration	Invited Talk I Dr. Daesoon Kim Korea Shipbuilding and Offshore Engineering, Republic of Korea	Invited Talk II Prof. Yousef Ibrahim Federation University Australia
10:00 – 10:30	Opening Welcome to IWIS 2022	Break	Break
10:30 – 11:50	Oral Session WA Intelligent Pedestrian and Transportation Systems I	Oral Session TA Application of AI	Oral Session FA Human Machine Interaction and Robotics II
12:00 – 13:30	Lunch	Lunch	Closing Workshop & Lunch & Local Tour
13:30 – 15:50	Oral Session WB Intelligent Pedestrian and Transportation Systems II	Oral Session TB Human Machine Interaction and Robotics I	
15:50 – 17:00	Break	Break	
	Moving for Welcome Reception	Interactive Poster Session I	
18:00 – 21:00	Welcome Reception at the Shilla Stay Ulsan (Dinner and Drinks)	Banquet	Farewell Dinner

Workshop Program August 17 – August 19, 2022 University of Ulsan, Korea (Time zone UTC+9)	
UTC +9 Korea	Wednesday, Aug. 17 2022
09:00 – 10:00	Opening Welcome Chair: Prof. Kang-Hyun Jo, University of Ulsan, Republic of Korea. Room: Grand Room
Oral Session WA Intelligent Pedestrian and Transportation Systems I Chair: Dr. Dwisnanto Putro <i>Korea</i> Session room: Grand Room	
10:00 – 11:50	WA1: BiSeNet with Depthwise Attention Spatial Path for Semantic Segmentation <i>Seongmin Kim and Kanghyun Jo (Korea)</i> WA2: An Optimal Torque Distribution Strategy Using Efficiency Maps of Front and Rear Drivetrain for Electric Vehicles <i>Kiho Jeon, Jung Hyun Choi and Sehoon Oh (Korea)</i> WA3: Sensor Fusion of Camera and 2D LiDAR for Self-Driving Automobile in Obstacle Avoidance Scenarios <i>Thanh-Danh Phan, Tan-Thien-Nien Nguyen, Minh-Thien Duong, Chi-Tam Nguyen, Hong-Phong Ly and My-Ha Le (Vietnam)</i> WA4: Real-time Train Wagon Counting and Number Recognition Algorithm (Video presentation) <i>Andrey Vavilin, Andrey Lomov and Roman Titkov (Russia)</i>
Oral Session WB Intelligent Pedestrian and Transportation Systems II Chair: Chairs: Dr. Qing Tang <i>Korea</i> Session room: Grand Room	

13:30 – 15:50	WB1: Estimation of Traffic Density Using CNN with Simple Architecture <i>Muhammad Ardi Putra, Agus Harjoko and Wahyono Wahyono (Indonesia)</i> WB2: TASuRe: Text Aware Super-Resolution (Video presentation) <i>Elena Filonenko, Alexander Filonenko and Kang-Hyun Jo (Russia)</i> WB3: A Study on Efficient Multi-task Networks for Multiple Object Tracking <i>Xuan-Thuy Vo, Tien Dat Tran, Duy-Linh Nguyen and Kanghyun Jo (Korea)</i> WB4: Vehicle Position Prediction Using Drone Traffic Dataset <i>Youlkyeong Lee, Qing Tang, Jehwan Choi and Kanghyun Jo (Korea)</i> WB6: Lightweight Bird Eye View Detection Network with Bridge Block Based on YOLOv5 <i>Jehwan Choi and Kanghyun Jo (Korea)</i> WB6: Shadow processing with color model adjustment and texture analysis (Video presentation) <i>Md. Azhar Uddin, Tahmina Khanam, Muhammad Ibrahim Khan, Kaushik Deb and Kang-Hyun Jo (bangladesh)</i> WB7: Efficient Residual Bottleneck for Object Detection on CPU <i>Jinsu An, Dwisnanto Muhamad Putro, Kanghyun Jo (Korea)</i>
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UTC +9 Korea	Thursday, Aug. 18 2022
9:00 – 10:00	Keynote Title: Intelligent Manufacturing System for Heavy Structures <i>Dr. Daesoon Kim, Korea Shipbuilding and Offshore Engineering, Republic of Korea</i> Session room: Grand Room
Oral Session TA Human Machine Interaction and Robotics I Chair: Prof. Youngsoo Suh <i>Korea</i> Session room: Grand Room	
10:30 – 11:50	TA1: Unsupervised Object Re-identification via Irregular Sampling <i>Qing Tang, Ge Cao and Kanghyun Jo (Korea)</i> TA2: Graph-based Attribute-aware Unsupervised Person Re-identification with Contrastive learning (Video presentation) <i>Ge Cao, Qing Tang and Kanghyun Jo (Korea)</i> TA3: POCS-based Clustering Algorithm <i>Le-Anh Tran, Henock Deberneh, Truong-Dong Do, Thanh-Dat Nguyen, My-Ha Le and Dong-Chul Park (Korea)</i> TA4: Automatic Feature Detection and Classification for Watermelon (Citrillus lanatus) (Video presentation) <i>Danilo Cáceres-Hernandez, Javier Sánchez-Galán, Anel Henry and Kanghyun Jo (Russia)</i>
Oral Session TB Application of AI Chairs: Prof. Daisuke Chugo <i>Japan</i> Session room: Grand Room	
13:30 – 15:10	TB1: A Real-time Face Detector on CPU Using Efficient Transformer <i>Muhamad Dwisnanto Putro, Adri Priadana, Duy-Linh Nguyen and Kanghyun Jo (Korea)</i>

	TB2: A Fast Real-time Face Gender Detector on CPU using Superficial Network with Attention Modules <i>Adri Priadana, Muhamad Dwisnanto Putro, Changhyun Jeong and Kanghyun Jo (Korea)</i> TB3: Development of Web-based Metaverse Platform <i>Junmyeong Kim, Changhyeon Jeong and Kanghyun Jo (Korea)</i> TB4: Implementation of P&O MPPT Control for Standalone PV System and its Efficiency Analysis <i>Yicheng Zhou, Yokoyama Ryuichi, Jinhua She and Yosuke Nakanishi (Japan)</i> TB5: 3D Printing for Human Tendon-Muscle Gradient Scaffolds Engineering <i>Thi Thanh Tho Nguyen, Van Thuy Duong, Le Thi Huong and Kyo-In Koo (Korea)</i> TB6: Attribute Estimation using Pedestrian Clothing and Autonomous Mobile Robot Navigation based on it <i>Hidenao Takahashi, Nami Takino, Hiroki Hashimoto, Daisuke Chugo, Satoshi Muramatsu, Sho Yokota, Jin-Hua She and Hiroshi Hashimoto (Japan)</i>
Poster Session TC Interactive Poster Session I Chair: Prof. My-Ha Le <i>Vietnam</i> Session room: Grand Room	
15:50 – 16:50	TC1: Distance estimation using drone image <i>Kwanho Kim and Kanghyun Jo (Korea)</i> TC2: Crack discrimination for walking assistance for blind people using MOBILENET <i>Kyeongmin You, Nayeon Kim and Kanghyun Jo (Korea)</i>

	TC3: Traffic Signs Classification Using Road Surface Signs Dataset <i>Jongchae Lee, Min Namgoong and Kanghyun Jo (Korea)</i> TC4: Dynamic Fire Module Based Light-YOLO <i>Seongbo Ha and Kanghyun Jo (Korea)</i> TC5: Reinforced BiseNet by Using CBAM <i>Inha Park and Kanghyun Jo (Korea)</i>
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UTC +9 Korea	Friday, Aug. 19 2022
09:30 – 10:30	Title: Intelligent Manufacturing System for Heavy Structures <i>Prof. Yousef Ibrahim, Federation University Australia</i> Session room: Grand Room
Oral Session FA Human Machine Interaction and Robotics II Chair: Prof. Agus Harjoko <i>Japan</i> Session room: Grand Room	
10:30 – 11:50	FA1: Skeleton-based Recognition of Pedestrian Crossing Intention using Attention Graph Neural Networks <i>Manh Cuong Le, Truong Dong Do, Minh-Thien Duong, Tran-Nhat-Minh Ta, Van-Binh Nguyen and My-Ha Le (Vietnam)</i> FA2: A Vision-based Hand-sign Language Teaching System using Deep Neural Network: Methodology and Experiments <i>Nghe-Nhan Truong, Truong-Dong Do, Thien-Sang Le Nguyen, Minh-Thien Duong, Thanh-Hai Nguyen and My-Ha Le (Vietnam)</i> FA3: Efficient High-Resolution Network for Human Pose Estimation <i>Tien Dat Tran, Xuan Thuy Vo, Duy-Linh Nguyen and Kang-Hyun Jo (Korea)</i> FA4: Robust Hand Detection Based on Convolutional Neural Network and Attention Module <i>Duy-Linh Nguyen, Dwisnanto Putro, Xuan-Thuy Vo, Tien-Dat Tran and Kang-Hyun Jo (Korea)</i>

IWIS2022 First Day – Wednesday, Aug. 17 2022				
Session	Location	Time	Paper Title	Authors/Speaker
Opening	Grand Room	10:00 – 10:30	Opening Welcome	Prof. Kanghyun Jo, University of Ulsan, Republic of Korea
Break		10:00 – 10:30	Coffee & Tea	
Oral Session WA Intelligent Pedestrian and Transportation Systems I Chairs: Dr. Dwisnanto Putro	Grand Room	10:30 – 10:50	WA1: BiSeNet with Depthwise Attention Spatial Path for Semantic Segmentation	Seongmin Kim and Kanghyun Jo
	Grand Room	10:50 – 11:10	WA2: An Optimal Torque Distribution Strategy Using Efficiency Maps of Front and Rear Drivetrain for Electric Vehicles	Kiho Jeon, Jung Hyun Choi and Sehoon Oh
	Grand Room	11:10 – 11:30	WA3: Sensor Fusion of Camera and 2D LiDAR for Self-Driving Automobile in Obstacle Avoidance Scenarios	Thanh-Danh Phan, Tan-Thien-Nien Nguyen, Minh-Thien Duong, Chi-Tam Nguyen, Hong-Phong Ly and My-Ha Le
	Grand Room	11:30 – 11:50	WA4: Real-time Train Wagon Counting and Number Recognition Algorithm	Andrey Vavilin, Andrey Lomov and Roman Titkov
Break		12:00 – 13:30	Lunch	
Oral Session WB Intelligent Pedestrian and Transportation Systems II Chairs: Dr. Qing Tang	Grand Room	13:30 – 13:50	WB1: Estimation of Traffic Density Using CNN with Simple Architecture	Muhammad Ardi Putra, Agus Harjoko and Wahyono Wahyono
	Grand Room	13:50 – 14:10	WB2: TASuRe: Text Aware Super-Resolution	Elena Filonenko, Alexander Filonenko and Kang-Hyun Jo
	Grand Room	14:10 – 14:30	WB3: A Study on Efficient Multi-task Networks for Multiple Object Tracking	Xuan-Thuy Vo, Tien Dat Tran, Duy-Linh Nguyen and Kanghyun Jo
	Grand Room	14:30 – 14:50	WB4: Vehicle Position Prediction Using Drone Traffic Dataset	Youlkyeong Lee, Qing Tang, Jehwan Choi and Kanghyun Jo
	Grand Room	14:50 – 15:10	WB5: Lightweight Bird Eye View Detection Network with Bridge Block Based on YOLOv5	Jehwan Choi and Kanghyun Jo

	Grand Room	15:10 – 15:30	WB6: Shadow processing with color model adjustment and texture analysis	Md. Azhar Uddin, Tahmina Khanam, Muhammad Ibrahim Khan, Kaushik Deb and Kang-Hyun Jo
	Grand Room	15:30 – 15:50	WB7: Efficient Residual Bottleneck for Object Detection on CPU	Jinsu An, Dwisnanto Muhamad Putro, Kanghyun Jo
Break		15:50 – 16:30	Break	
Social Active Event		16:30 – 17:00	University of Ulsan → Welcome Reception at the Shilla Stay Ulsan	
		18:00 – 20:00	Welcome Reception at the Shilla Stay Ulsan (Dinner and Drinks)	

IWIS2022 Second Day – Thursday, Aug. 18 2022				
Session	Location	Time	Paper Title	Authors/Speaker
Keynote	Grand Room	09:00 – 10:00	Title: Intelligent Manufacturing System for Heavy Structures	Dr. Daesoon Kim, Korea Shipbuilding and Offshore Engineering, Republic of Korea
Break		10:00 – 10:30	Coffee & Tea	
Oral Session TA Human Machine Interaction and Robotics I Chairs: Prof. Youngsoo Suh	Grand Room	10:30 – 10:50	TA1: Unsupervised Object Re-identification via Irregular Sampling	Qing Tang, Ge Cao and Kanghyun Jo
	Grand Room	10:50 – 11:10	TA2: Graph-based Attribute-aware Unsupervised Person Re-identification with Contrastive learning	Ge Cao, Qing Tang and Kanghyun Jo
	Grand Room	11:10 – 11:30	TA3: POCS-based Clustering Algorithm	Le-Anh Tran, Henock Deberneh, Truong-Dong Do, Thanh-Dat Nguyen, My-Ha Le and Dong-Chul Park
	Grand Room	11:30 – 11:50	TA4: Automatic Feature Detection and Classification for Watermelon (Citrullus lanatus)	Danilo Cáceres-Hernandez, Javier Sánchez-Galán, Anel Henry and Kanghyun Jo
Break		12:00 – 13:30	Lunch	
Oral Session TB Application of AI Chairs: Prof. Daisuke Chugo	Grand Room	13:30 – 13:50	TB1: A Real-time Face Detector on CPU Using Efficient Transformer	Muhamad Dwisnanto Putro, Adri Priadana, Duy-Linh Nguyen and Kanghyun Jo
	Grand Room	13:50 – 14:10	TB2: A Fast Real-time Face Gender Detector on CPU using Superficial Network with Attention Modules	Adri Priadana, Muhamad Dwisnanto Putro, Changhyun Jeong and Kanghyun Jo
	Grand Room	14:10 – 14:30	TB3: Development of Web-based Metaverse Platform	Junmyeong Kim, Changhyeon Jeong and Kanghyun Jo
	Grand Room	14:30 – 14:50	TB4: Implementation of P&O MPPT Control for Standalone PV System and its Efficiency Analysis	Yicheng Zhou, Yokoyama Ryuichi, Jinhua She and Yosuke Nakanishi
	Grand Room	14:50 – 15:10	TB5: 3D Printing for Human Tendon-Muscle Gradient Scaffolds Engineering	Thi Thanh Tho Nguyen, Van Thuy Duong, Le Thi Huong and Kyo-In Koo

	Grand Room	15:10-15:30	TB6: Attribute Estimation using Pedestrian Clothing and Autonomous Mobile Robot Navigation based on it	Hidenao Takahashi, Nami Takino, Hiroki Hashimoto, Daisuke Chugo, Satoshi Muramatsu, Sho Yokota, Jin-Hua She and Hiroshi Hashimoto
Break		15:30 – 15:50	Break	
Poster Session TC Interactive Poster Session I Chairs: Prof. My Ha Le	Grand Room	15:50 – 17:00	TC1: Distance Estimation using Drone Image	Kwanho Kim and Kanghyun Jo
			TC2: Crack Discrimination for Walking Assistance for Blind People using MOBILENET	Kyeongmin You, Nayeon Kim and Kanghyun Jo
			TC3: Traffic Signs Classification Using Road Surface Signs Dataset	Jongchae Lee, Min Namgoong and Kanghyun Jo
			TC4: Dynamic Fire Module Based Light-YOLO	Seongbo Ha and Kanghyun Jo
			TC5: Reinforced BiseNet by Using CBAM	Inha Park and Kanghyun Jo
Social Active Event		17:20 – 18:00	University of Ulsan → Banquet Place	
		18:00 – 21:00	Banquet	

IWIS2022 Third Day – Friday, Aug. 19 2022				
Session	Location	Time	Paper Title	Authors/Speaker
Break		09:00 – 09:30	Morning Coffee & Tea	
Keynote	Grand Room	09:30 – 10:00	Title: Intelligent Manufacturing System for Heavy Structures	Prof. Yousef Ibrahim, Federation University Australia
Break		10:00 – 10:30	Break	
Oral Session FA Human Machine Interaction and Robotics II Chairs: Prof. Agus Harjoko	Grand Room	10:30 – 10:50	FA1: Skeleton-based Recognition of Pedestrian Crossing Intention using Attention Graph Neural Networks	Manh Cuong Le, Truong Dong Do, Minh-Thien Duong, Tran-Nhat-Minh Ta, Van-Binh Nguyen and My-Ha Le
	Grand Room	10:50 – 11:10	FA2: A Vision-based Hand-sign Language Teaching System using Deep Neural Network: Methodology and Experiments	Nghe-Nhan Truong, Truong-Dong Do, Thien-Sang Le Nguyen, Minh-Thien Duong, Thanh-Hai Nguyen and My-Ha Le
	Grand Room	11:10 – 11:30	FA3: Efficient High-Resolution Network for Human Pose Estimation	Tien Dat Tran, Xuan Thuy Vo, Duy-Linh Nguyen and Kang-Hyun Jo
	Grand Room	11:30 – 11:50	FA4: Robust Hand Detection Based on Convolutional Neural Network and Attention Module	Duy-Linh Nguyen, Dwisnanto Putro, Xuan-Thuy Vo, Tien-Dat Tran and Kang-Hyun Jo
End Conference	Grand Room	11:50 – 12:10	Award & Closing	
Break		12:10 – 13:00	Lunch	
Tour		13:00 – 13:20	Taking Tour Bus in Front of Conference Building	
		13:20 – 14:00	University of Ulsan → Daewangam Park in Ulsan	
		14:00 – 16:30	Local Tour	
		16:30 – 16:50	Daewangam Park in Ulsan → University of Ulsan	

Break		16:50 – 17:20	Break
Social Active Event		17:20 – 18:00	University of Ulsan → Farewell Dinner Restaurant
		18:00 – 21:00	Farewell at the Shilla Stay Ulsan (Dinner and Drinks)

The Bus Lines

between Main hotels and Conference Hall

Hotel Name	Bus No.	Starting Stop	Final Stop
LOTTE Hotel Ulsan	401 1723 1127	Intercity & Express Bus Terminal	Univ. of Ulsan
LOTTE City Hotel Ulsan	401 1723 1127	Mokhwa Wedding Hall	
Ulsan City Hotel	401 1723 1127	Hyundai Department Store	
Shilla Stay Ulsan	401 415 1127	Mokhwa Wedding Hall	

Notes:

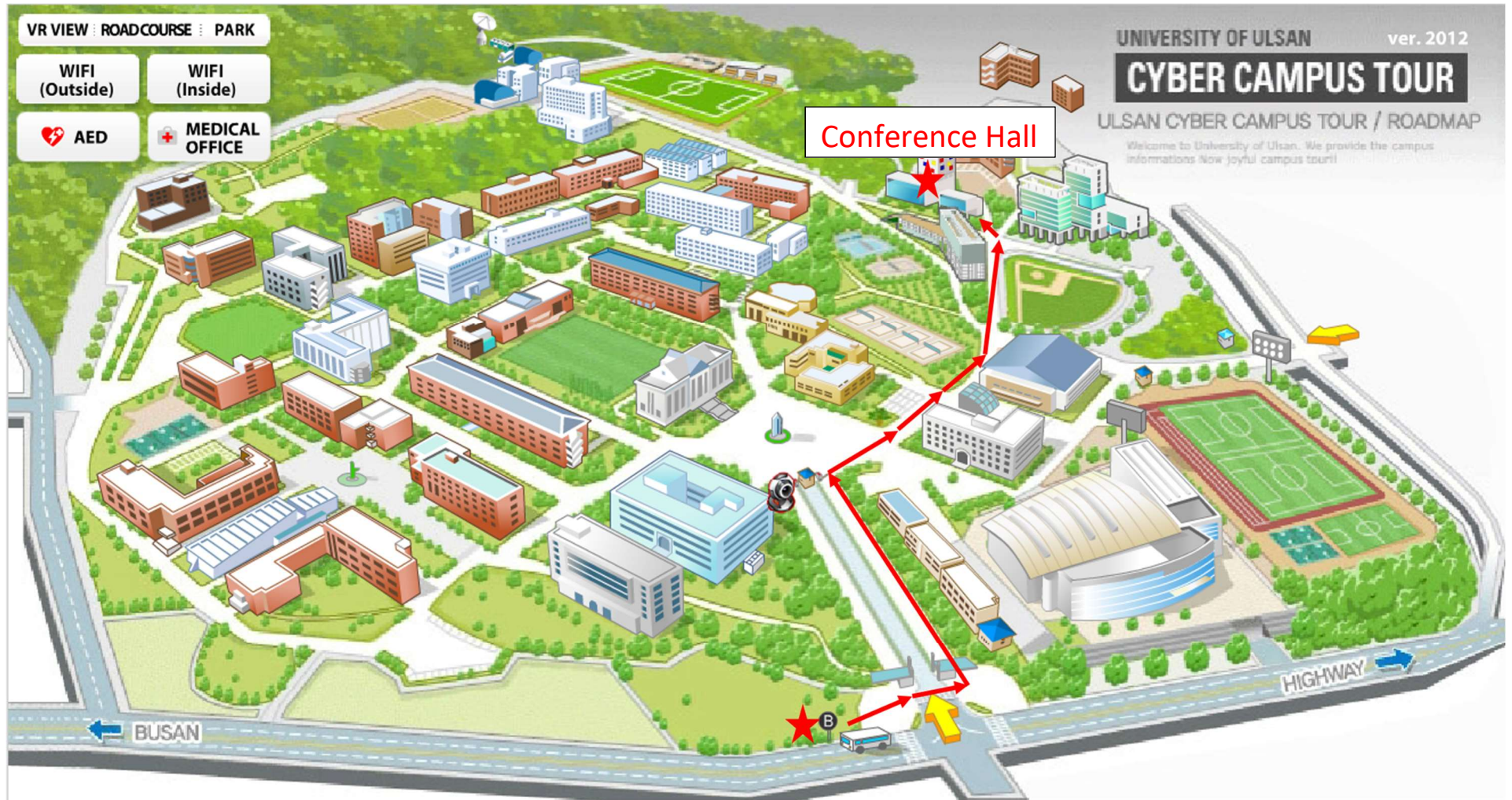
1. The general bus 401, 415 charge 1300 won.
2. The express bus 1127, 1723 charge 2700 won.
3. Taxi charges almost 10000 won from the above hotel to Unv. Of Ulsan.
4. If you need any help for transpotation guidance, please feel free to call us:
 Russo: 010-9691-4598 ; Jinsu An: 010-9357-5488;
 Cao Ge: 010-2718-9706; Dat: 010-7926-8512;

The Main Hotels and Related Bus Stop



Note: Please go across the road to take related bus!

Campus Roadmap





Room 7-104, Intelligent Systems Laboratory

93 Daehak-road, Nam-gu, Ulsan (44610), Korea

Tel. +82-52-259-1664

<http://islab.ulsan.ac.kr/iwis2022>