ICTCA 2025

16th International Conference on Theoretical and Computational Acoustics

August 18[Mon] - 22[Fri], 2025

BEXCO, Busan Korea

PROGRAM BOOK

SAEVIT TECHNOLOGIES

Professional company in infrasound industry

SAEVIT Technologies

The first WNRS installed in Korea
(Wind Noise Reduction System)

We have received technology transfer of WNRS, which has been internationally certified by CTBTO(Comprehensive Nuclear-Test-Ban Treaty Organization) IMS(International Measurement System) from Enviroearth Co. in France.
Currently installed in a national institution (33 stations) to prove its technological capabilities.

As the exclusive distributor of Seismo wave Co. in South Korea and a specialized company with unrivaled technology and expertise in infrasound.

Providing comprehensive solutions for infrasound

- Equipment sales
- Data collection
- Analytics S/W development
- Maintenance
- Derivative

HEADQUARTERS

042-936-8686

36, Techno 5-ro, Yuseong-gu, Daejeon, Republic of Korea

sales@saevit.co.kr , www.saevit.co.kr

CONTENTS

WELCOME MESSAGE

On behalf of the organizing committee, we are delighted to extend an invitation to you for the International Conference of Theoretical and Computational Acoustics (ICTCA 2025), which will take place at the Busan Exhibition and Convention Center (BEXCO) in Busan, Korea from August 18 to 22, 2025.

ICTCA 2025 aims to serve as a premier platform for scholars, researchers, and practitioners worldwide to discuss the latest advancements and research in the fields of theoretical and computational acoustics. The conference will feature a comprehensive program, including plenary lectures, technical sessions, and poster presentations, on-line presentations, all designed to facilitate the exchange of ideas and the dissemination of groundbreaking research findings.

Beyond the academic program, we have arranged a variety of social events to enable participants to experience the vibrant Korean culture and the renowned hospitality of Busan. Known for its beautiful beaches, dynamic culture, and historical landmarks, Busan offers the perfect setting for both scholarly inspiration and relaxation.

As Korea' s leading port city and a cultural hub, Busan provides the ideal backdrop for ICTCA 2025, promising not only a stimulating academic exchange but also an unforgettable cultural experience. We are eager to welcome you to what promises to be an engaging and fruitful conference in Busan.

We look forward to your participation in ICTCA 2025 and to welcoming you to Busan, Korea.
Sincerely,

Jea Soo Kim

Prof. Jeasoo Kim
Chair of the Organizing Committee
Department of Ocean Engineering
Korea Maritime & Ocean University (KMOU)

ORGANIZING COMMITTEE

- **Conference Chair**

  Jeasoo KIM (Korea Maritime and Ocean University)

- **Secretary General**

  Gihoon BYUN (Korea Maritime and Ocean University)

  Yonghwa CHOI (Korea Maritime and Ocean University)

- **Technical Program**

  Seongil KIM (Agency for Defense Development)

  Wan-Ho CHO (Korea Research Institute of Standards and Science)

- **Finance**

  Gihoon BYUN (Korea Maritime and Ocean University)

  Imseon HAN (Korea Maritime and Ocean University)

- **Publication**

  Sung-Hoon BYUN (Korea Research Institute of Ships & Ocean engineering)

  Jungpyo Hong (Changwon National University)

- **Student Program**

  Kyusik CHANG (VRSound)

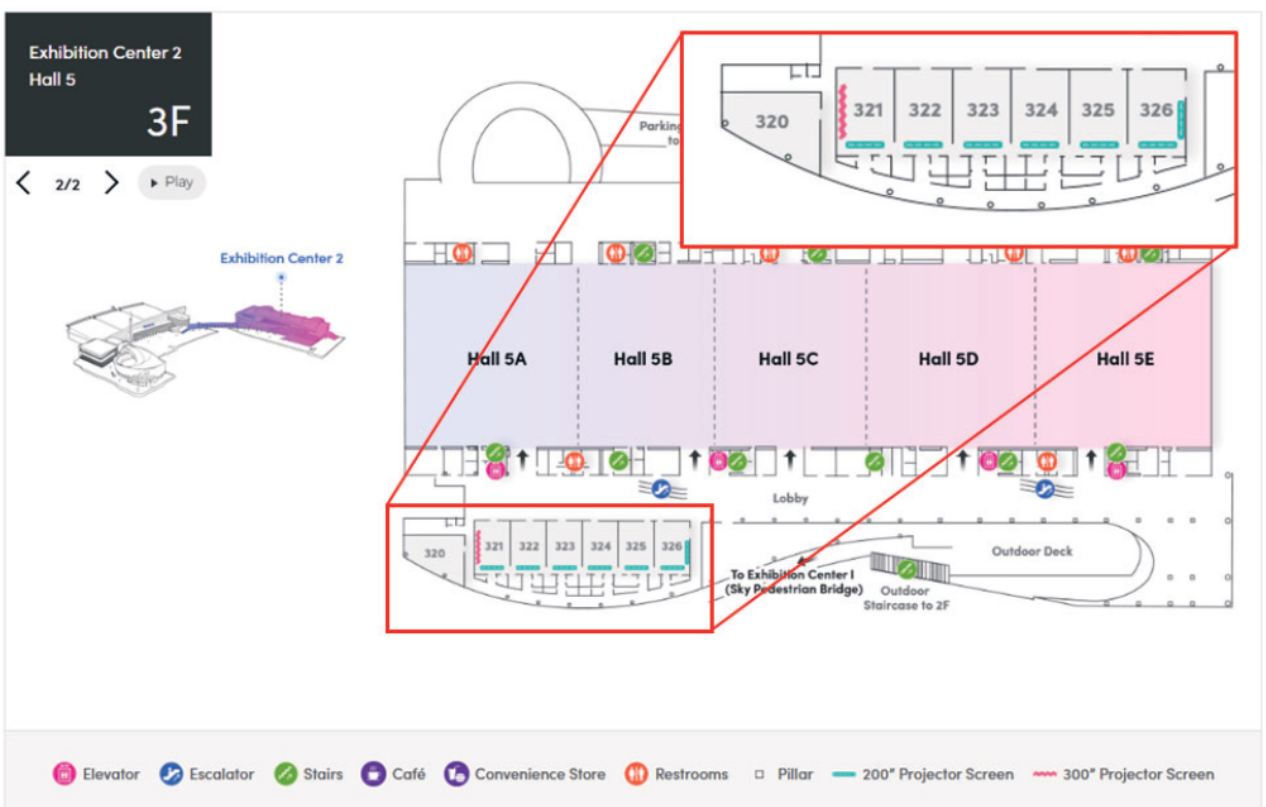
- **Conference Chair**

  Il SUNG (Agency for Defense Development)

VENUE

BEXCO, Exhibition Center II

* Room 320: Preparation room equipped with a laptop and printer.
* Rooms 321 and 322: Plenary Lectures
* Rooms 323 to 325: Oral Presentations
* Room 326: Poster Presentations



CONTACT INFORMATION

Conference Help Desk (On-site)

- Location : Registration Desk, 3F Lobby, BEXCO Exhibition Center II
- Email : ictca2025@gmail.com

Emergency Services (Korea)

- Police / Fire : ☎ 112 / 119
- Nearest Hospital :
  Pusan National University Hospital
  179 Gudeok-ro, Seo-gu, Busan
  Phone: +82-51-240-7000

ICTCA2025 Emergency Coordinator

- Name : Yonghwa Choi
- Mobile : +82-10-7232-1477
- Language : Korean / English available

SOCIAL PROGRAM

a. Monday 18 August 2025 – Welcome Reception

- The reception will offer light snacks and drinks.
- Place: Room 320 (VIP Room), Exhibition Center II, BEXCO
- Time: 16:20 – 17:40

b. Tuesday 19 August 2025 – Student Reception

- The Student Reception is open to all registered participants.
  Non-student attendees may join with a donation of 10,000 KRW.
  Light snacks and drinks will be served.
- Place: Room 320 (VIP Room), Exhibition Center II, BEXCO
- Time: 16:00 – 17:40

c. Wednesday 20 August 2025 – City Tour

- Assembly Point: Gate 8 at the Main Entrance of Exhibition Center II, BEXCO

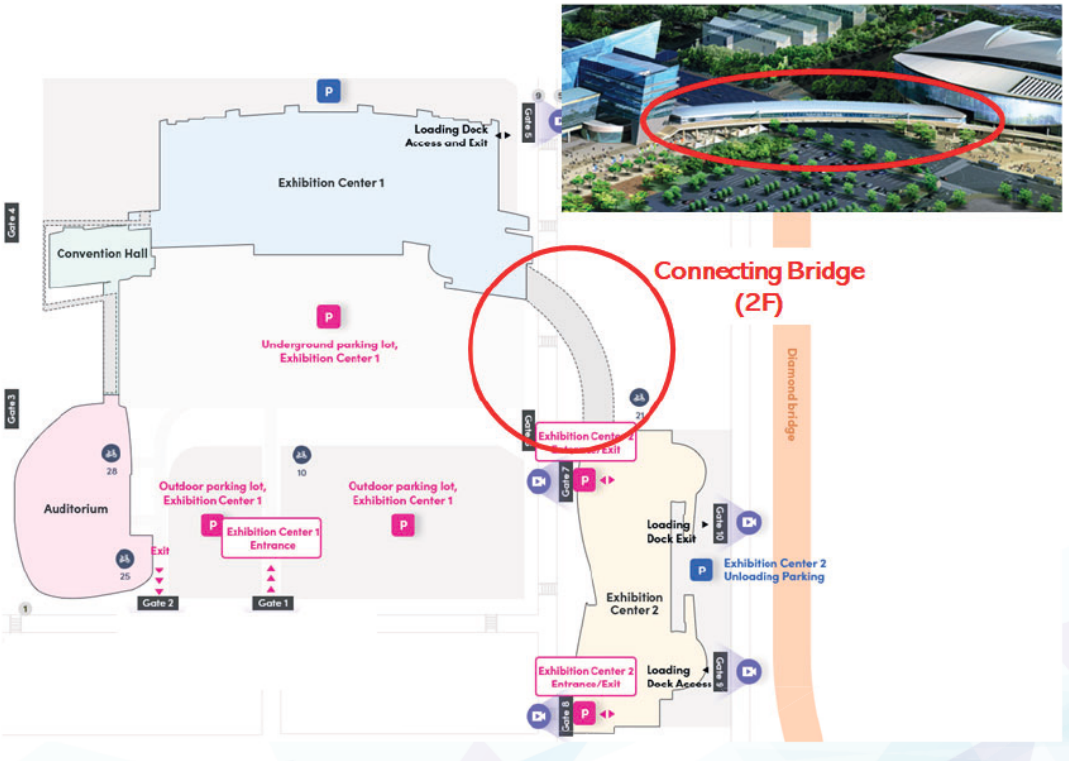
- Time: 13:30 – 17:30
- Tour Itinerary
  Stop 1: Hae-dong Yonggungsa Temple
  Stop 2: Gijang Balhyo (Traditional Makgeolli-making experience)

SOCIAL PROGRAM

※ Participants may register for the city tour at the registration desk until the conclusion of Tuesday's sessions. (First come, first served.)

d. Wednesday 20 August 2025 – Banquet

- Place: The Party Buffet, Exhibition Center I (Basement Level 1), BEXCO
- Time: 18:00 – 20:00 (following the social tour)



SOCIAL PROGRAM

Exhibition Center 1
B1

e. Thursday 21 August 2025 – Farewell party & Student award ceremony

- Place: Room 320 (VIP Room), Exhibition Center II, BEXCO
- Time: 16:00 - 17:40

LUNCH VOUCHER

ICTCA 2025

Lunch Voucher

₩12,000

Lunch Voucher Usage Guide

* Valid only for lunch from August 18 to August 21, 2025
* Location: Restaurants on B1 floor, Exhibition Hall 1, BEXCO (Korean Restaurant, Gaemijip, Chakan Jipbap, French, Jang Udon)

※ Any amount exceeding the voucher value must be paid by the individual.

Lunch Voucher Information

- Each registered participant will receive two lunch vouchers.
- Each voucher is valued at **12,000 KRW**, based on the Korean Won.
- Vouchers can be used during the conference period at participating restaurants located on the **basement level of Exhibition Center I, BEXCO.**
- A total of five restaurants accept the lunch vouchers. The list is provided below.

Restaurants

Jangudong

Location Exhibition Center 1, B1F
Tel +82-51-740-7475
Industry Restaurant (Korean)
Time 09:00 ~ 18:00

French

Location Exhibition Center 1, 1F
Tel +82-51-740-7897
Industry Restaurant (Pork Cutlet, Pasta, etc.)
Time 10:00 ~ 18:00

Chakhanjibbab

Location Exhibition Center 1, B1F
Tel +82-51-740-8008
Industry Restaurant (Korean)
Time 09:00 ~ 18:00

Gaemijip

Location Exhibition Center 1, B1F
Tel +82-51-740-7666
Industry Restaurant (Stir-fried Octopus)
Time 09:00 ~ 18:00

Hansikdang

Location Exhibition Center 1, B1F
Tel +82-51-740-7776
Industry Restaurant (Korean)
Time 09:00 ~ 18:00

SPONSORS


ASA
ACOUSTICAL SOCIETY
OF AMERICA


EAA


The Acoustical
Society of Korea


TQV


SAEVIT
TECHNOLOGIES


ORUN


HUENS


stx Engine


BOSTECH


KOREA
TOURISM
ORGANIZATION


bto BUSAN


SonarTech


Hanwha Systems


LIG Nex1

PROGRAM OVERVIEW

<table>
<tr><th colspan="6">Monday, August 18, 2025</th></tr>
<tr><th>ROOM</th><th>321+322</th><th>323</th><th>324</th><th>325</th><th>326</th></tr>
<tr><td>10:40-13:20</td><td colspan="5">Registration (3F)</td></tr>
<tr><td>13:20-14:00</td><td>Plenary Lecture 1
(Chi-Fang Chen, Chair : Jeasoo Kim)</td><td colspan="4"></td></tr>
<tr><td>14:00-14:20</td><td colspan="5">Coffee Break</td></tr>
<tr><td>14:20-14:40</td><td rowspan="6"></td><td rowspan="6">Structural Acoustics and Vibration</td><td rowspan="6">Acoustic Scattering and Geoacoustic Inversion in Marine Sediments</td><td rowspan="6">Model-Based and Data-Driven Approaches in Underwater Acoustics</td><td rowspan="6"></td></tr>
<tr><td>14:40-15:00</td></tr>
<tr><td>15:00-15:20</td></tr>
<tr><td>15:20-15:40</td></tr>
<tr><td>15:40-16:00</td></tr>
<tr><td>16:00-16:20</td></tr>
<tr><td>16:20-17:40</td><td colspan="5">Welcome Reception</td></tr>
<tr><th colspan="6">Tuesday, August 19, 2025</th></tr>
<tr><th>ROOM</th><th>321+322</th><th>323</th><th>324</th><th>325</th><th>326</th></tr>
<tr><td>09:00-09:20</td><td rowspan="5"></td><td rowspan="5">Beamforming and DOA Estimation in Underwater Acoustics</td><td rowspan="5">Underwater Acoustic Source Localization and Tracking</td><td rowspan="5">Inverse Design of Acoustic Metamaterials</td><td rowspan="5"></td></tr>
<tr><td>09:20-09:40</td></tr>
<tr><td>09:40-10:00</td></tr>
<tr><td>10:00-10:20</td></tr>
<tr><td>10:20-10:40</td></tr>
<tr><td>10:40-11:00</td><td colspan="5">Coffee Break</td></tr>
<tr><td>11:00-11:40</td><td>Plenary Lecture 2
(Haiqiang Niu, Chair : Gihoon Byun)</td><td colspan="4"></td></tr>
<tr><td>11:40-13:20</td><td colspan="5">Lunch</td></tr>
<tr><td>13:20-14:00</td><td>Plenary Lecture 3
(Wonju Jeon, Chair : Wanho Cho)</td><td colspan="4"></td></tr>
<tr><td>14:00-14:20</td><td colspan="5">Coffee Break</td></tr>
<tr><td>14:20-16:00</td><td></td><td></td><td></td><td></td><td>Poster</td></tr>
<tr><td>16:00-17:40</td><td colspan="5">Student Reception</td></tr>
</table>

PROGRAM OVERVIEW

Wednesday, August 20, 2025					
ROOM	**321+322**	**323**	**324**	**325**	**326**
09:00-09:20		Low-Frequency Acoustic Propagation and Sonar Signal Processing	Environmental Effects on Deep Ocean Acoustic Propagation	Acoustic Metamaterials and Metasurfaces for Noise Reduction and Wave Control	
09:20-09:40					
09:40-10:00					
10:00-10:20					
10:20-10:40					
10:40-11:00	Coffee Break				
11:00-11:40	Plenary Lecture 4 (Andrés Prieto Aneiros, Chair : Steffen Marburg)				
11:40-13:20	Lunch				
13:30-17:30	**City Tour**				
18:00-20:00	**Banquet**				
Thursday, August 21, 2025					
ROOM	**321+322**	**323**	**324**	**325**	**326**
09:00-09:20		Advanced Tracking Algorithms and Acoustic Estimation for Underwater Targets	Receiver Design and Robust Signal Processing for Underwater Acoustic Communications	Ultrasound and Acoustic Materials for Performance Enhancement and Structural Monitoring	
09:20-09:40					
09:40-10:00					
10:00-10:20					
10:20-10:40					
10:40-11:00	Coffee Break				
11:00-11:40	Plenary Lecture 5 (Marcus Maeder, Chair : Jeasoo Kim)				
11:40-13:20	Lunch				
13:20-14:00	Plenary Lecture 6 (Sean F. Wu, Chair : Chi-Fang Chen)				
14:00-14:20	Coffee Break				
14:20-14:40		AI and Acoustic Sensing Applications in Industry, Ecology, and Medicine	Modeling and Detection of Acoustic Signatures from Complex Underwater Structures	Computational and Intelligent Approaches in Speech and Acoustics	
14:40-15:00					
15:00-15:20					
15:20-15:40					
15:40-16:00					
16:00-17:40	**Farewell Party & Student Award Ceremony**				

PROGRAM OVERVIEW

Friday, August 22, 2025					
ROOM	321+322	323	324	325	326
09:00-11:40	**Committee Meeting**				

PLENARY LECTURES

Plenary Lecture 1
13:20–14:00, Aug 18 (Mon)

LONG-TERM MARINE SOUNDSCAPE MONITORING IN TAIWAN'S OFFSHORE WINDFARM AREAS: ECOLOGICAL INSIGHTS AND CONSERVATION INPLICATIONS

Chi-Fang Chen
National Taiwan University, Taiwan

Taiwan has set an ambitious target of achieving carbon neutrality by 2050, with offshore wind power anticipated to generate 40–55 GW. The rapid development of offshore wind farms along the Eastern Taiwan Strait (ETS) introduces significant underwater noise from construction activities such as pile driving, increased vessel traffic during surveys and construction, and continuous operational noise over a projected lifespan of 20–30 years. This escalating anthropogenic noise imposes considerable stress on the marine soundscape and its ecological constituents. Our research focuses on long-term acoustic monitoring at wind farm sites (2014–2024), investigating the changes in sound levels and their ecological consequences, particularly the acoustic behaviors of fish and the critically endangered Taiwanese humpback dolphin (Sousa chinensis taiwanensis). For the first time, our findings reveal clear impacts of pile-driving and operational noise on fish vocalization patterns and demonstrate how vessel traffic and windfarm-related noise influence the acoustic behavior of Taiwanese humpback dolphins. Additionally, we have developed automated detection algorithms to effectively identify vocalizations of both fish and dolphins from extensive acoustic datasets. As offshore wind energy expands, these long-term acoustical datasets serve as essential baseline data for monitoring evolving marine soundscapes and understanding the acoustic responses of marine species throughout the lifecycle of offshore windfarms. These insights are critical for informing conservation strategies and sustainable management practices in Taiwan's transition to renewable energy. This research is funded by Taiwan National Science and Technology Council, Unitech Inc., Ørsted Taiwan, Copenhagen Infrastructure Partners (CIP), Taiwan Power Company.

PLENARY LECTURES

Plenary Lecture 2
11:00–11:40, Aug 19 (Tue)

ADVANCES AND APPLICATIONS OF MACHINE LEARNING IN UNDERWATER ACOUSTIC SOURCE LOCALIZATION AND PROPAGATION MODELING

Haiqiang Niu
Institute of Acoustics, Chinese Academy of Sciences, People's Republic of China

In this talk, I will present our recent advances in applying machine learning to underwater acoustic source localization and propagation modeling. Our studies on source localization cover a range of environments, from shallow waters to deep sea scenarios, utilizing both real and synthetic data sets for training. The results demonstrate the superiority of machine learning methods over traditional approaches in handling the environmental uncertainties. We will also discuss some conclusions and the challenging problems encountered in source localization applications. The second focus of this presentation is on acoustic propagation modeling using neural operators. Unlike physics-informed neural network (PINN) methods, neural operators derive underlying relationships primarily from extensive, well-prepared data sets. Instead of learning mappings between finite-dimensional Euclidean spaces, these data-driven neural operators learn mappings between infinite-dimensional function spaces, which is particularly attractive for sound propagation modeling tasks. We will examine the generalization capabilities of neural operators when applied to sound propagation modeling in range-independent shallow water environments.

PLENARY LECTURES

Plenary Lecture 3
13:20–14:00, Aug 19 (Tue)

ACOUSTIC BLACK HOLES AND META-SURFACES: NEW SOLUTIONS FOR OLD PROBLEMS

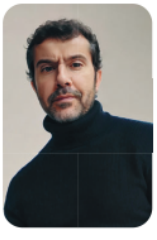
Wonju Jeon
Korea Advanced Institute of Science and Technology, Republic of Korea

In this talk, recent advances in acoustic and elastic meta-structures to control noise and vibration are presented aiming at practical applications to real-world problems in our daily life and various industries. The first example is an ultra-light (20 times lighter than existing materials) soundproofing meta-panel to insulate broadband noise generated from electric vehicles, with the aid of negative mass density in low-frequency range (road noise) and negative bulk modulus in high-frequency range (motor noise). The second one is an acoustic meta-liner to insulate noise in a duct while allowing flow, by designing ultra-thin acoustic meta-surface with the consideration of visco-thermal losses in deep-subwavelength-scale Helmholtz resonators. The third one is a meta-damper to suppress vibration in beams or plates using waveguide absorbers based on Archimedean spiral acoustic black holes. For the three meta-structures, we present how to design them theoretically and validate their performance experimentally with a couple of audiovisual demonstrations.

PLENARY LECTURES

Plenary Lecture 4
11:00–11:40, Aug 20 (Wed)

PERFECTLY MATCHED LAYERS: ACHIEVEMENTS AND FUTURE CHALLENGES



Andrés Prieto Aneiros
Galician Center of Mathematical Research and Technology, University of A Coruña, Spain

The Perfectly Matched Layer (PML) technique has become a reliable and efficient method for computing free-field numerical approximations in time-domain and frequency-domain models over the last three decades. Its combination with the widely used finite difference and finite element methods has spread its popularity and generalized its use to broad different areas of applications such as outdoor acoustics, aeroacoustics, structural mechanics, underwater acoustics, electromagnetism, optics, or geophysics, all of them with a common denominator: the wave propagation phenomena settled initially in an unbounded physical domain of interest. Currently, the PML technique is a key component in many well-known, established commercial and open-source software packages in computational acoustics. The study of its robustness, usability, and accuracy has gained attention from various research communities, facilitating the numerical analysis of its properties, extending the PML techniques to a number of different models, and enhancing its computational performance with optimal settings. This talk reviews the theoretical properties and computational capabilities of different state-of-the-art PML methods, and discusses the open questions and challenges that will be addressed in the near future of PML technique development.

PLENARY LECTURES

Plenary Lecture 5
11:00–11:40, Aug 21 (Thu)

IN THE AGE OF BIG DATA AND AI – RISKS AND OPPORTUNITIES FOR VIBROACOUSTICS

Marcus Maeder
Technical University of Munich, Germany

By looking back at the technology sector, common phrases such as the Internet of Things, Industry 4.0, Big Data, and Artificial Intelligence dominated the discussions through various fields of research, industry, and economy. Due to the rapid development of parallel processing hardware technology, algorithms, and the corresponding software solutions since 2015, this trend experienced unprecedented acceleration, with the release of the first ChatGPT version in late 2022, highlighting the age of AI. Despite the ongoing development of Artificial Intelligence, the excessive expectations in the technology followed by depression and disappointment as one part of a typical hype cycle, this technology offers a wide range of possibilities for researchers and engineers in the field of theoretical, experimental, and computational vibroacoustics if applied correctly and with care. This presentation examines current developments in artificial intelligence together with risks and opportunities when utilizing the technology to solve problems in the field of vibroacoustic. The importance of high-quality data and its associated nature are stressed, leading to a knowledge-and-experience-enhanced artificial intelligence (keeAI) incorporating problem-specific domain expertise of the developer and engineer, respectively. The presented examples serve as a possible template for future developments and help to facilitate the application of Big Data approaches and Artificial Intelligence beyond the disappointment of excessive expectations.

PLENARY LECTURES

Plenary Lecture 6
13:20–14:00, Aug 21 (Thu)

ADVANCES IN UNDERWATER ACOUSTICS, STRUCTURAL ACOUSTICS, COMPUTATIONAL ACOUSTICS, AND AEROACOUSTICS

Sean F. Wu
Department of Mechanical Engineering, Wayne State University, U.S.A.

This paper presents a comprehensive review of key developments in four major branches of acoustics—Underwater Acoustics, Structural Acoustics, Computational Acoustics, and Aeroacoustics—as reflected in contributions published in the Journal of Theoretical and Computational Acoustics over the past thirty years. For each of these areas, we systematically classify the literature into three major categories:

Review Articles that synthesize foundational knowledge and provide historical context, New Methodologies that introduce cutting-edge theoretical frameworks and advanced computational techniques, and Emerging Applications that showcase the practical deployment of recent innovations, often validated through experimental investigations.

This structured review highlights major trends, breakthroughs, and evolving research directions in both theory and application. In Underwater Acoustics, advancements in signal propagation modeling and sonar system design are emphasized. Structural Acoustics features innovations in wave-structure interaction and vibroacoustic coupling. Computational Acoustics showcases high-performance numerical solvers, boundary element and finite element methods, and hybrid algorithms. In Aeroacoustics, recent progress includes improved modeling of turbulent flows, noise prediction for aircraft and wind turbines, and experimental validation of simulation results. By curating and contextualizing this body of work, we aim to provide researchers, educators, and practitioners with a valuable reference point and roadmap for future research. We hope this review serves as a gateway to deeper exploration, enabling readers to trace developments through the referenced literature and engage with ongoing innovations in these dynamic fields of acoustics.

DAILY PROGRAM

AUGUST 18 (MON)

10:40 – 13:20	REGISTRATION	3F
13:20 – 14:00	PLENARY LECTURE 1	321+322 (3F)
Chair	Jeasoo Kim (Korea Maritime and Ocean University)	
	Long-Term Marine Soundscape Monitoring in Taiwan's Offshore Windfarm Areas: Ecological Insights and Conservation Implications	
	Chi-Fang Chen (National Taiwan University)	
14:20 – 16:00	Structural Acoustics and Vibration	323 (3F)
Chair	Seong-Hyun Lee (Korea Institute of Machinery and Materials)	
14:20	Continuation methods applied to topology optimization with discrete variables	
	Sang Won Kang, Gil Ho Yoon, Young Hun Choi	
14:40	Reduction of low-frequency and broadband vibrations in plates using vortex-shaped embedded acoustic black holes	
	Taehwan Son, Seongmin Park, Wonju Jeon	
15:00	Temperature-dependent sound absorption characteristics of microlattice materials backed with air cavity	
	Xiaozhen Li, Xiaobing Cai	
15:20	Sound absorption performance of bead-filled honeycomb composite structure	
	Long Xu, Xiaobing Cai	
15:40	Meta-fence for Rayleigh wave isolation	
	Hongjun Fan, Yongquan Liu	

DAILY PROGRAM

14:20 – 16:20	Acoustic Scattering and Geoacoustic Inversion in Marine Sediments 324 (3F)
Chair	Hefeng Dong (Norwegian University of Science and Technology)
14:20	Wavelet Scattering Characteristics and Range Correction of Spherical Targets in Random Boundary Shallow Water Wave-guide
	Jiani Wen, Haisen Li, Jian Wang, Tianyao Xing
14:40	The inference of Deep-Sea Sedimentary Layer Properties in the Northwest Subbasin of the South China Sea
	Yongchao Guo, Haigang Zhang, Minghui Zhang
15:00	Numerical comparison of the frequency response function of different poroelastic models in stratified sediments using pointwise sources
	Andrés Prieto Aneiros
15:20	Numerical Analysis of Acoustic Scattering from Buried Targets under Varying Sediment and Target Conditions
	Yeon-Seong Choo, Sung-Hoon Byun, Sea-Moon Kim
15:40	Geoacoustic Inversion of Continuous Sediment Layer in Deep Water Using Ship Noise
	Houxuan Jiang, Minshuai Liang, Junjie Shi, Dajun Sun
16:00	A Physics-Based Deep Learning Method for Rigid Scattering
	Arzhang Angoshtari

14:20 – 16:00	Model-Based and Data-Driven Approaches in Underwater Acoustics 325 (3F)
Chair	Donghyeon Kim (Scripps Institution of Oceanography)
14:20	Model-guided deep learning in underwater acoustics: achieving reliable performance via synthetic training data
	Jongkwon Choi, Youngjoo Kim, Keunhwa Lee
14:40	Impact of ship density on underwater acoustic detection range
	Youngseung Kim, Dong-Gyun Han, Wonjun Yang, Sungho Cho, Jee Woong Choi

DAILY PROGRAM

15:00	Doppler shift frequency estimation using time-frequency variation analysis Ji-Hyun Lee, Dan-Bi Ou, Ki-Man Kim
15:20	Coefficient of Variation Analysis in Passive Time-spectral Features for Ship Identification Youngjoo Kim, Hongsung Jeong, Jongkwon Choi, Keunhwa Lee
15:40	Array Invariant-Based Passive Localization Using Deconvolved Beamforming Wonjun Yang, Dong-Gyun Han, Jee Woong Choi

AUGUST 19 (TUE)

09:00 – 10:20	Beamforming and DOA Estimation in Underwater Acoustics	323 (3F)
Chair	Jeung-Hoon Lee (Changwon National University)	
09:00	Effects of Amplitude-phase Deviation on Azimuth Estimation and Beamforming in Vector Subbottom Profiling Signal Processing Yanchao Li, Jianjun Zhu, Zhou Meng, Yu Chen, Guoqing Zhao, Korochentsev V.I.	
09:20	Research on near-field hyper beamforming for large aperture arrays Yanbo Wang, Jidan Mei, Shuhui Wang	
09:40	A joint azimuth and radial velocity method for underwater passive multi-target tracking Yuhang Yi, Bin Qi, Guolong Liang	
10:00	Broadband Target Direction of Arrival Estimation Based on a Single Pressure-difference Vector Hydrophone Zehua Wang, Junjie Shi, Minshuai Liang, Dajun Sun	

DAILY PROGRAM

09:00 – 10:20	Underwater Acoustic Source Localization and Tracking	324 (3F)
Chair	In-Jee Jung (Korea Research Institute of Standards and Science)	
09:00	Range localization of a broadband moving source using the field differencing method	
	Daehwan Kim, Sung-Hoon Byun	
09:20	Underwater Multi-node Fusion Tracking Method with Integrated Target Motion Characteristics	
	Pengchao Liu, Xinyi Guo	
09:40	Localization of whale's call using a single underwater acoustic vector sensor	
	Hefeng Dong, Guosong Zhang, Victor Espinosa Rosello, Isabel Pérez Arjona, Josephine Nell Schulze	
10:00	Multi-range sparse Bayesian learning for broadband modal phase velocity estimation and shallow-water geoacoustic inversion	
	Shanru Lin, Haiqiang Niu, Zhenglin Li, Yonggang Guo	

09:00 – 10:40	Inverse Design of Acoustic Metamaterials	325 (3F)
Chair	Jaeyub Hyun (Pukyong National University)	
09:00	Topology Optimization of a Viscoelastic Dynamic Vibration Absorber for Multi-Eigenfrequency Attenuation	
	Hyunggyu Choi, Gil Ho Yoon	
09:20	AI-assisted topology optimization of acoustic mufflers via reinforcement learning	
	Kee Seung Oh, Hayoung Chung, Joo Hwan Oh	
09:40	Deep-subwavelength lightweight acoustic metamaterial for broadband sound insulation	
	Jiwan Kim, Wonju Jeon	
10:00	Low-speed, low-impedance elastic metamaterial for enhancing the mechanical-to-electric energy conversion efficiency of triboelectric harvesters	
	Hyung Jin Lee, Hong Min Seung, Jun Hyeong Park, Hyun Soo Kim, Sunghoon Hur, Hyun-Cheol Song	

DAILY PROGRAM

10:20	Inverse Design of Electrode Patterns for Multi-Point Acoustic Focusing via Level-Set Topology Optimization	
	Sanguk Park, Jaeyub Hyun	
11:00 – 11:40	**PLENARY LECTURE 2**	**321+322 (3F)**
Chair	Gihoon Byun (Korea Maritime and Ocean University)	
	Advances and applications of machine learning in underwater acoustic source localization and propagation modeling	
	Haiqiang Niu (Institute of Acoustics, Chinese Academy of Sciences)	
13:20 – 14:00	**PLENARY LECTURE 3**	**321+322 (3F)**
Chair	Wan-Ho Cho (Korea Research Institute of Standards and Science)	
	Acoustic black holes and meta-surfaces: New solutions for old problems	
	Wonju Jeon (Korea Advanced Institute of Science and Technology)	

DAILY PROGRAM

AUGUST 20 (WED)

09:00 – 10:20	Low-Frequency Acoustic Propagation and Sonar Signal Processing	323 (3F)
Chair	Sung-Hoon Byun (Korea Research Institute of Ships & Ocean engineering)	
09:00	Non-Integer Order Parabolic Cylinder Functions in Very-Low-Frequency sound Propagation: A WKB method for Ocean Boundary Effects	
	Jiankang Zhan, Shengchun Piao, Lijia Gong	
09:20	A Cyclic Overlapping Subpulse Coherent Processing Interval Method with Dual Weighting for Continuous Active Sonar: Uniform Updates and Enhanced Performance	
	Zhe Cao, Long-Hao Qiu, Yan Wang, Guo-Long Liang, Shu-Xian Hao	
09:40	Fast Chirp Rate Estimation Method for LFM Signals in Impulsive Noise Environments	
	Shu-Xian Hao, Long-Hao Qiu, Guo-Long Liang, Zhe Cao	
10:00	Model Order Reduction for Horizontal Refraction Equation Solutions: An Efficient Framework for Directional Three-Dimensional Acoustic Wave Propagation Modeling	
	Tengjiao He	

09:00 – 10:40	Environmental Effects on Deep Ocean Acoustic Propagation	324 (3F)
Chair	Wei-Chun Hu (National Taiwan University)	
09:00	The effects of Indian Ocean Dipole on the convergence zone in the Eastern Indian Ocean	
	Shuanglin Wu, Jixing Qin, Zhenglin li	
09:20	Mechanisms of Convergence Zone Splitting in Deep-Sea Acoustic Propagation	
	Fujin Yang, Tao Hu, Zhen Wang, Pengxi Zhou	

DAILY PROGRAM

09:40	Research on sound propagation modeling and characteristics in narrow channels under rough ice layer cover
	Pengcheng Chai
10:00	Analysis of Very-Low Frequency Acoustic Signals Obtained by OBS in Deep Ocean
	Yunuo Jin, Lijia Gong
10:20	Analysis of surface vessel radiation noise measured by OBS in deep ocean
	Yuchen Jiang, Lijia Gong, Jiayao Shi
09:00 – 10:40	**Acoustic Metamaterials and Metasurfaces for Noise Reduction and Wave Control** 325 (3F)
Chair	Hyung Jin Lee (Korea Research Institute of Standards and Science)
09:00	Noise reduction in a flow duct with varying cross-sectional area using ventilated acoustic metamaterials
	Dohaeng Kim, Jiwan Kim, Wonju Jeon
09:20	Ultrasonic metamaterial for enhancing pulse transmission through acoustic barrier
	Junyong An, Chankyu Kim, Wonju Jeon
09:40	Acoustic metasurfaces with complex-valued impedances for reducing noise from an open structure
	Eunjin Yang, Wonju Jeon
10:00	Uniform sound distribution in indoor environments using acoustic metasurfaces with complex-valued impedance
	Eunji Choi, Jiwan Kim, Wonju Jeon
10:20	Deep generative model-based optimization and inverse design of ventilated acoustic metamaterials
	Min Woo Cho, Keon Ko, Sang Min Park

DAILY PROGRAM

11:00 – 11:40	PLENARY LECTURE 4	321+322 (3F)
Chair	Steffen Marburg (Technical University of Munich)	
	Perfectly Matched Layers: achievements and future challenges	
	Andrés Prieto Aneiros (University of A Coruña)	

AUGUST 21 (THU)

09:00 – 10:20	Advanced Tracking Algorithms and Acoustic Estimation for Underwater Targets 323 (3F)
Chair	Sea-Moon Kim (Korea Research Institute of Ships & Ocean engineering)
09:00	Improved Underwater Multi-target Track-Before-Detect Algorithm Based on Firefly Algorithm
	Yushi Shen, Bin Qi, Xiang Li, Chenxin Hui
09:20	A Particle Filter Track-Before-Detect Method with Adaptive Diffusion Functions for Proximity Scenarios
	JunFei Zhou, Bin Qi, ChenXin Hui, Xiang Li, Dong Xu
09:40	Estimation of source levels for unmanned underwater vehicles
	GuhnHyeko Ko, ChangSoo Kim, ByoungNam Kim, YoSup Park, CheolSoo Park, DongGuk Paeng
10:00	Research on bearings-only Association Algorithm under Unknown Measurement Noise Conditions
	Jiaxin Zhou, Bin QI, Jinjin Wang, Yilin Wang

DAILY PROGRAM

09:00 – 10:20	Receiver Design and Robust Signal Processing for Underwater Acoustic Communications 324 (3F)
Chair	Jungpyo Hong (Changwon National University)
09:00	A Message Passing Decision Feedback Receiver with IDI-Progressive Framework for Underwater acoustic OTFS Communications
	Yang Yang, Lu Ma, Boon-Chong Seet
09:20	An Adaptive RAKE Receiver Based on Bionic Underwater Acoustic Communication by Mimicking Dolphin
	Tiany Liu, Songzuo Liu, Yipeng Xing, Jiaxuan Li, Gang Qiao
09:40	Iterative Underwater Acoustic DSSS Processing Algorithm for Integrated Communication and Localization System in Non-Uniform Doppler and Strong Noise Interference Channels
	Jinhao Deng, Jie Wu, Hongyu Cui
10:00	Nonlinear Composite Chirp Preamble for Enhanced Synchronization in Narrowband Underwater Acoustic Communications
	Bogeun Seo, Sangman Han, Haklim Ko, Hojun Lee

09:00 – 10:40	Ultrasound and Acoustic Materials for Performance Enhancement and Structural Monitoring 325 (3F)
Chair	Ivan Smirnov (Oxford Suzhou Centre for Advanced Research)
09:00	Tesla Valve-Inspired Metamaterial Design for Enhanced Acoustic Performance in Load-Bearing Mortar
	Kebede Alemayehu Moges, Youngbeom Beak, Sungwoo Park, Sukhoon Pyo
09:20	Complementary metamaterial for ultrasound transmission through elastic barrier
	Ki Yong Lee, Wonju Jeon
09:40	Simulation of ultrasonic reactors with different frequencies for processing flowing liquid media
	Ivan Smirnov, Mohan Zhang, James Kwan

DAILY PROGRAM

10:00	Investigation of the Impact of Surface Holes on the Sound Absorption Performance of Rubber Coatings
	Bo Hu, Xingchao Yu, Jintong Gao, Sijia Wang, Bowen Shi, Haoyang Zhang
10:20	Characterization and Early Detection of Hydrogen Embrittlement in Offshore Bolts using Acoustic Emission
	Nokhaiz Sabir
11:00 – 11:40	**PLENARY LECTURE 5** **321+322 (3F)**
Chair	Jeasoo Kim (Korea Maritime and Ocean University)
	In the Age of Big Data and AI – Risks and Opportunities for Vibroacoustics
	Marcus Maeder (Technical University of Munich)
13:20 – 14:00	**PLENARY LECTURE 6** **321+322 (3F)**
Chair	Chi-Fang Chen (National Taiwan University)
	Advances in Underwater Acoustics, Structural Acoustics, Computational Acoustics, and Aeroacoustics
	Sean F. Wu (Wayne State University)
14:20 – 15:40	**AI and Acoustic Sensing Applications in Industry, Ecology, and Medicine** **323 (3F)**
Chair	Jae Hak Jeong (Korea National University of Transportation)
14:20	Artificial Intelligence-Powered Acoustic Fingerprint-Based DeepScan for Product Quality Control Testing
	Lingguang Chen, Nicholas Kalvaitis, Sean F. Wu
14:40	Real-Time Smart Buoy System for Cetacean Monitoring
	Ching-Tang Hung, Wei-Lun Li, Meng-Fan Tsai, Wei-Chun Hu, Chi-Fang Chen

DAILY PROGRAM

15:00	Reproduction and Analysis of Pulse Wave Propagation and Velocity (PWV) in the Human Aorta
	Jae-Hak Jeong
15:20	Model refinements to better estimate ship-generated noise impact on endangered species
	Maximilian Lauch
14:20-15:40	**Modeling and Detection of Acoustic Signatures from Complex Underwater Structures 324 (3F)**
Chair	Kyungmin Baik (Korea Research Institute of Standards and Science)
14:20	Comparative analysis of array characteristics of different planar arrays
	Jiaxin Du, Nan Zou, Guangpu Zhang, Jingze Huang
14:40	Effects of appendages on the turbulence and flow noise of a submarine model using high-order scheme
	Peng Jiang, Shijun Liao, Bin Xie
15:00	Modelling and simulation of Ship-Excited Micro-Doppler Effect
	Minhao Wang, Cuie Zheng, Tianye Na
15:20	Research on nonlinear Acoustic Detection of Submarine Pipelines Based on 3D Height Field Modeling
	Peng-Yue Wang, Jian-Jun Zhu, Pei-Hong Wang, Guo-Qing Zhao

DAILY PROGRAM

14:20 – 15:20	Computational and intelligent approaches in speech and acoustics	325 (3F)
Chair	Wan-Ho Cho (Korea Research Institute of Standards and Science)	
14:20	Classifying American English Dialects Using Acoustic-Prosodic Features Extracted by openSMILE	
	Rylen W. Garlitz	
14:40	Development of accurate transmission line matrix method in acoustics and its application to underwater acoustics	
	Wan-Gu Kim, Young Geul Yoon, Ho Youn Ji, Min-Seok Choi, Seong Hyeon Kim, Soonyeol Kwon, Bok Kyoung Choi, Byoung-Nam Kim, Keunhwa Lee, Sufyan Ali Memon	
15:00	Evaluation of demodulated sound enhancement based on carrier waves boosting with distortion components of modulated wave for parametric array loudspeakers	
	Mizuki IWAGAMI, Yoto IKEZAKI, Yuting GENG, Masato NAKAYAMA, Takanobu NISHIURA	

POSTER SESSION

AUGUST 19 (TUE)

14:20 – 16:00	Poster Session	326 (3F)
Chair(s)	Il Sung (Agency for Defense Development) Kyusik Chang (VRSound)	
1	A Study on the Measurement of Low-Altitude Small UAV Propulsion Noise	
	Il Sung, Seongil Kim, Wonjung Yoon, Johwan Yang	
2	A Hybrid Self-Attention and U-Net Architecture for three-dimensional Ocean Sound Speed Fields Prediction	
	Yingjie Li, Jixing Qin	
3	Deep Learning Approach to Identify Left Ventricular dysfunction from ECG in Patients with Left Bundle Block Patients	
	Chanjin Kwon, Hyeongjun Ha, Hyebin Gwag, Jongwon Seok	
4	Multilingual text-to-speech model based on StyleTTS 2	
	Hojune Lee, Minseo Kim, Jongwon Seok	
5	Acoustic and Visual Surveys to Analyze the Behavior and Signature Whistles of Indo-Pacific Humpback Dolphins (Sousa chinensis) along the Western Coast of Taiwan	
	Xiang-Hong Lin, Shih-Hsien Weng, Chi-Hung Lin, Wei-Chun Hu, Lien-Siang Chou, Chi-Fang Chen	
6	Investigation of the ultrasonic wave propagation in biological tissues with a blood channel filled with microparticles	
	Mohan Zhang, Ivan Smirnov, James Kwan	
7	Unconventional Dirac-Weyl semimetal and step edge states in acoustic realizations	
	Peng Wu, Yu-Gui Peng, Xue-Feng Zhu	
8	Brillouin Light Scattering Imaging of Undistorted GHz Surface Phonons and Acoustic-Exciton Transport Control	
	Jie Yang, Xiao-Ze Liu, Xue-Feng Zhu	
9	EEG-Audio Multimodal Emotion Recognition via Cross-Modal Attention	
	Hyoung-Gook Kim, Ye-Ji Yoo, Kyu-Hyeok Lee, Jin-Young Kim	

POSTER SESSION

AUGUST 19 (TUE)

14:20 – 16:00	Poster Session	326 (3F)
10	Fast Multi-Frequency DOA Estimation Using Frequency-Difference Sparse Bayesian Learning	
	Xiaoyan Liu, Haiqiang Niu, Haibin Wang	
11	An Improved Particle-Based Track-Before-Detect Algorithm for Underwater Weak Target Tracking	
	Yifei Li, Bin Qi, Guolong Liang	
12	Virtual sound source construction based on direct-to-reverberant ratio control using a line array loudspeaker consisted of parametric and electrodynamic loudspeakers	
	Takumi IRIGUCHI, Yuting GENG, Masato NAKAYAMA, Takanobu NISHIURA	
13	Estimating Reverberation Time in Enclosed Spaces by Analyzing Spectrogram Variations in Stereo Recordings	
	Juseong Kim, Joonwhi Kim, Jungyu Choi, Sungbin Im	
14	Robust TDOA Estimation via Spatial Coherence and CNN-Based Integration in Noisy and Reverberant Environments	
	Eojin Kim, Joonwhi Kim, Jungyu Choi, Sungbin Im	
15	Optimized Microphone Array Configurations for TDOA-Based Direction Finding	
	Jae-Hyoun Ha	
16	Low-Latency Android-Based Deployment of Neural Speech Enhancement for Hearing Aid Applications	
	Jin Tae Seok, Hyun Jae Shin, Seon Man Kim	
17	Low-Latency Deep Learning-Based Denoising of Self-Generated Footstep Noise in Quadruped Robots for Remote Acoustic Situational Awareness	
	Hyun Jae Shin, Jin Tae Seok, Seon Man Kim	
18	Study on railway rolling sound calculation model	
	Hyo-In Koh, Anders Nordborg	

POSTER SESSION

AUGUST 19 (TUE)

14:20 – 16:00	Poster Session	326 (3F)
19	An automatic target extraction algorithm for active acoustic detection based on image processing	
	Fan Yin, Yiming Gu, Haibin Wang, Chao Li, Leixin Nie, Hao Yin	
20	Passive source localization by two hydrophones in direct arrival zone and shadow zone	
	Kang Zheng, Jixing Qin, Shuanglin Wu	
21	Deep-sea active detection method based on vertical phased array	
	Naibin Chen, Dayong Peng, Li Ma, Tao Hu	
22	Analysis of Vertical Correlation Characteristics of Deep-Sea Acoustic Fields in Cold Eddy Environments Based on Remote Sensing Data	
	Pengxi Zhou, Tao Hu, Zhen Wang, Fujin Yang	
23	Analysis of spatial correlation of non complete deep-sea acoustic axis sound field	
	Zhifei Fang, Xinyi Guo	
24	Feasibility of seawater temperature observation using coastal acoustic tomography in Yeosu Bay of South Korea	
	Wan-Gu Kim, Young Geul Yoon, Ho Youn Ji, Min-Seok Choi, Seong Hyeon Kim, Bok Kyoung Choi, Byoung-Nam Kim, Siwoo Lee	
25	Implementation and Sea Trial Validation of an OFDM-based Broadband Underwater Acoustic Communication System for Seismic Data Transmission	
	Seung-Gyu Kim, Sae-Yong Park, Tae-Ho Im	
26	Smart Manufacturing-Oriented Dataset for Early Detection of Bearing Defects	
	Yunsu Kim, Seungwoo Lee, Yujin Bang, Jongwon Seok	
27	A Shallow-water Source Localization Neural Network Based on Source Depth Classification	
	Jing Guo, Juan Zeng	

POSTER SESSION

AUGUST 19 (TUE)

14:20 – 16:00	Poster Session	326 (3F)
28	Unambiguous Localization Method for Long-Baseline Acoustic Sources Based on Consistent Likelihood Decision	
	Dong Xu, Yan Wang, Bin Qi, Binchao Yang, Xiang Li	
29	High-Precision Underwater Source Localization Based on Motion Compensation and Ray Tracing	
	Binchao Yang, Yan Wang, Bin Qi, Dong Xu, Xiang Li	
30	Analysis of uncertainty aspects for multi-megawatt turbines in acoustic measurements	
	Eunkuk Son, Seungjin Kang, Jinjae Lee, Minsang Kang, Songjune Lee, Gwang-Se Lee	
31	Review of 3D acoustic intensimetry for the sound source localization based on a compact microphone array	
	In-Jee Jung, Wan-Ho Cho	
32	Pork Adulteration detection in Beef Using an Electronic Nose System	
	Tajmal Hussain, Jongwon Seok	
33	Lightweight Neural Codec for DIFAR Sonobuoy Signal Transmission Using Residual Quantization and Pruning	
	Yeonjin Park, Jungpyo Hong	
34	High-Speed Moving Object Tracking Using Deep Reinforcement Leaning	
	Jiinyong Ha, Jungpyo Hong, Jongwon Seok	
35	Web-Based Real-Time Speech Conversion System for Dysarthria	
	Kwanghyun Park, Jungpyo Hong	

NOTES

NOTES

NOTES

BOSTECH Co., Ltd.

Total IT Infrastructure Integration & Maintenance Services

BOSTECH is a specialized Korean IT company providing fully integrated infrastructure solutions across defense, public, and enterprise sectors. From custom domestic server manufacturing (QTX) to virtualization, SDN, and encrypted data solutions, we connect your systems with trusted performance.

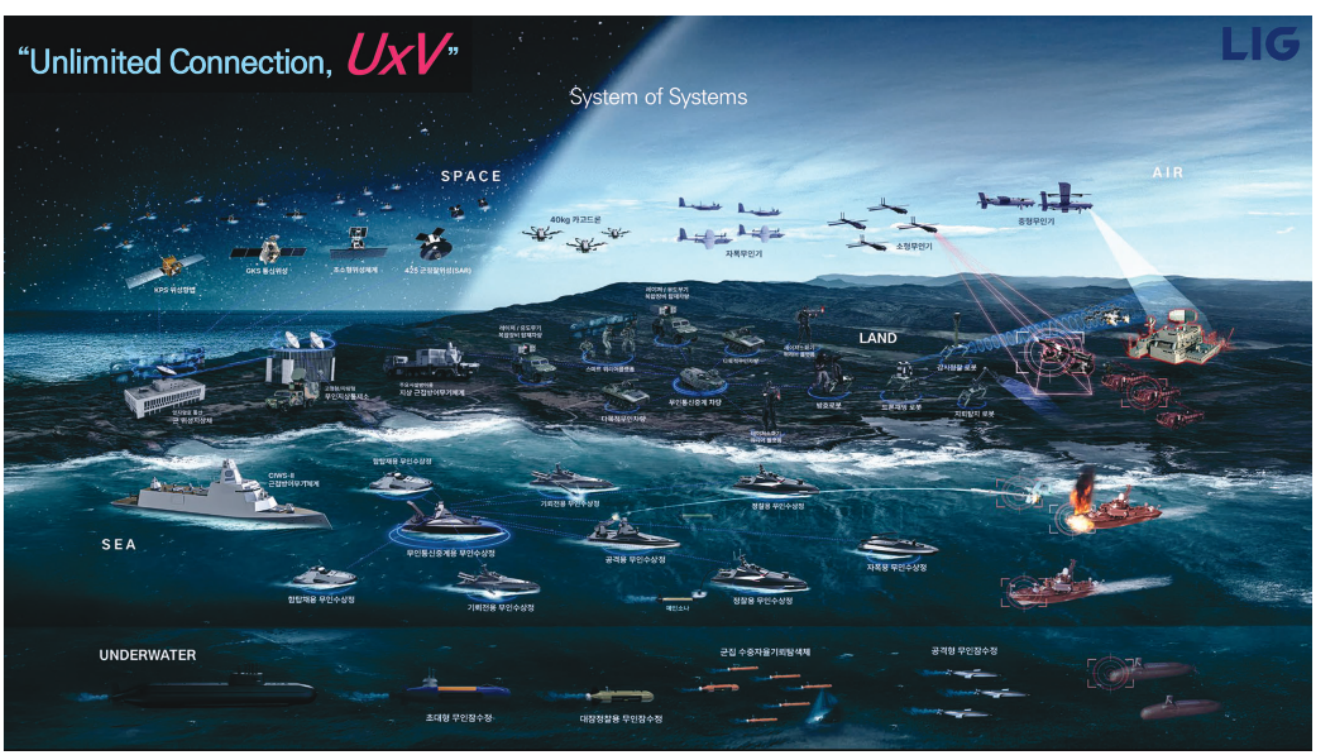
Our expertise spans:

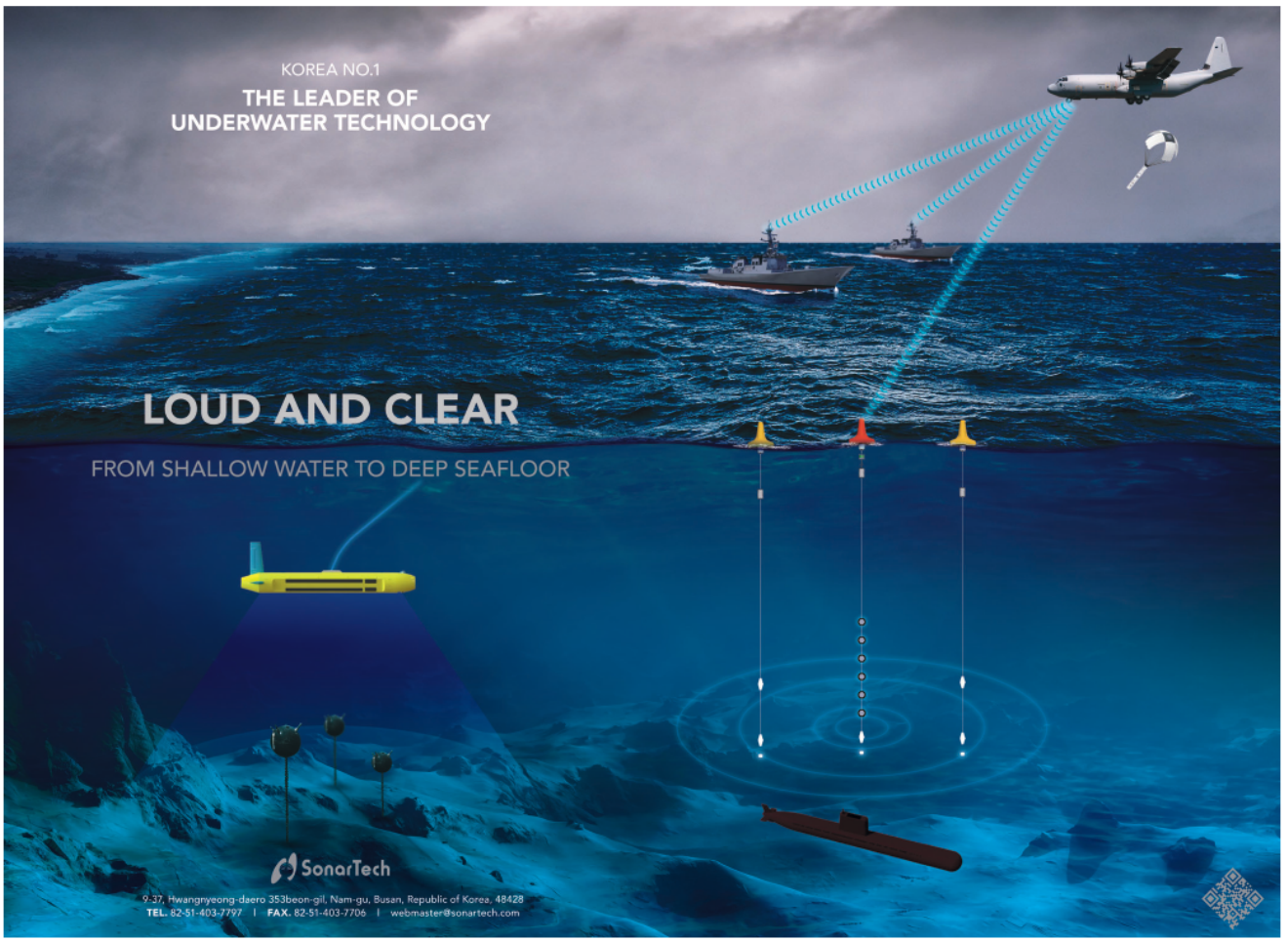
- Integrated maintenance services across server, storage, and network
- Cloud & HCI solutions using VMWare, Arista, Dell, and SUSE
- DB encryption support for mission-critical government systems
- 10+ years of experience with Korea's defense infrastructure (MOD, Cyber Command, DIDC)

We build secure, scalable, and high-availability systems — from planning to operation — through a proven, customer-first process.

Seoul, Republic of Korea | www.bostech.co.kr
kdson@bostech.co.kr | +82-2-3667-5803

BOSTECH
BUILDERS OF OUTSTANDING SOLUTION





ORUN Technologies Co., Ltd.

Pioneering Advanced Simulation and Underwater Acoustic Solutions

Since 2001, ORUN Technologies has delivered cutting-edge simulation and underwater acoustic solutions for naval defense applications. Based in Daejeon, Korea, we collaborate with LIG Nex1, Hanwha, and ADD to develop mission-critical systems.

Core Capabilities:

- Sonar & Combat System Simulators
  Customized simulators for sonar signal generation, target detection, and tactical training—applied to KSS-I/III, KDDX, and harbor surveillance systems.

- 3D Tactical Visualization with Unreal Engine
  Immersive, real-time 3D combat environments enabling realistic scenario-based training and operational analysis.

- OriRay: High-Speed Acoustic Propagation Model
  Our proprietary OriRay model rapidly simulates broadband acoustic transmission loss and detection probability using hybrid Gaussian–Geometric beams and frequency-dependent acoustic physics. Optimized for AI-driven sonar performance evaluation.

Technical Highlights:

- Real-time sonar signal simulation with Doppler effect and multipath propagation
- Generation of acoustic visibility maps for AI-based training and analysis

With over 20 years of expertise and more than 50 national defense projects successfully completed, ORUN is a trusted leader in sonar simulation and underwater acoustic innovation.

Daejeon, Korea | www.orun.co.kr
njseoung@orun.co.kr | +82-42-336-4600

TOV
TECHNOLOGY

직원이 행복한 기업, 나라를 생각하는 기업

www.tovtek.com

TOV tech. Co., Ltd.

주식회사 토브텍

대표이사	허을회
설립년도	2012년
임 직 원	15명 : 연구원 12명 (석/박사 개발자 5명)
소 재 지	대전광역시 유성구 테크노4로 17, B동 314~315호 (관평동, 대덕비즈센터)

방위산업의 미래기술을 개척하고 더 안전한 내일을 설계합니다

2012년 설립된 주식회사 토브텍은 수중무기체계 관련 다양한 시뮬레이터, M&S(Modeling & Simulation) 및 시험 장비를 개발하고 있습니다. 또한 신호처리 기술을 바탕으로 해양산업을 비롯하여 항공 등 다양한 분야로 비즈니스 영역을 확장하고 있습니다.

최근 급변하는 세계 안보의 중심에서 한국 방위산업은 그 우수성을 꾸준히 인정받고 있습니다.
10여 년간 대한민국의 주요 방위산업의 파트너로 함께 성장해 온 토브텍은 도전과 혁신으로 미래기술을 개척하고 더 안전한 우리의 내일을 설계해 나갈 것입니다.

토브텍의 최고의 가치는 우리 모두가 행복한 동행입니다.
기술혁신과 인재양성으로 고객과 함께 더 행복한 내일을 꿈꾸고 지속적으로 성장하는 토브텍이 되겠습니다.

주요 사업분야

- 수중무기체계 시뮬레이터
- 시험/분석 장비 해상 시험 장비
- 솔루션 개발