

# Inkyu An

Researcher at ETRI

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## Research Interests

Algorithms for Robot Audition such as Speech Enhancement, Speech Separation, Speech Recognition, Sound Source Localization, and other related things

## Professional Experiences

- **Researcher** 08/2023-Now  
Integrated Intelligence Research Section,  
Electronics and Telecommunications Research Institute (ETRI),  
South Korea

## Education

- **Ph.D., School of Computing** 03/2018-08/2023  
*An Outstanding PhD Thesis in School of Computing for Year 2023*  
Thesis title: Sound Source Localization with Novel Acoustic Cues for Robots  
Advisor: Sung-Eui Yoon  
KAIST, South Korea
- **M.S., Robotics Program** 03/2016-02/2018  
Advisor: Sung-Eui Yoon  
KAIST, South Korea
- **B.S., Electronic Engineering** 03/2009-02/2016  
Dongguk Univ., South Korea

## Publications

- 1. Microphone Pair Training for Robust Sound Source Localization With Diverse Array Configurations**  
[Inkyu An](#), Guoyuan An, Taeyoung Kim, and Sung-Eui Yoon  
IEEE Robotics and Automation Letters (RA-L) 2024

2. **Topological RANSAC for instance verification and retrieval without fine-tuning**  
Guoyuan An, Juhyung Seon, [Inkyu An](#), Yuchi Huo, and Sung-Eui Yoon  
Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS), 2023
3. **Diffraction- and Reflection-Aware Multiple Sound Source Localization**  
[Inkyu An](#), Youngsun Kwon, and Sung-Eui Yoon  
IEEE Transactions On Robotics (T-RO) 2022
4. **Inexpensive Indoor Acoustic Material Estimation for Realistic Sound Propagation**  
Taeyoung Kim, [Inkyu An](#), and Sung-Eui Yoon  
Computer Animation and Virtual Worlds 2022
5. **Robust Sound Source Localization considering Similarity of Back-Propagation Signals**  
[Inkyu An](#), Byeongho-Jo, Youngsun Kwon, Jung-woo Choi, and Sung-Eui Yoon  
*IEEE International Conference on Robotics and Automation (ICRA) 2020*
6. **Super Rays and Culling Region for Real-Time Updates on Grid-based Occupancy Maps**  
Youngsun Kwon, Donghyuk Kim, [Inkyu An](#), and Sung-Eui Yoon  
*IEEE Transactions On Robotics (T-RO) 2019*
7. **Diffraction-Aware Sound Localization for a Non-Line-of-Sight Source**  
[Inkyu An](#), Doheon Lee, Jung-woo Choi, Dinesh Manocha, and Sung-Eui Yoon  
*IEEE International Conference on Robotics and Automation (ICRA) 2019*
8. **Reflection-aware Sound Source Localization**  
[Inkyu An](#), Myungbae Son, Dinesh Manocha, and Sung-Eui Yoon  
*IEEE International Conference on Robotics and Automation (ICRA) 2018*
9. **A Content-Aware Non-Uniform Grid for Fast Map Deformation**  
Pio Claudio, [Inkyu An](#), Sung-Eui Yoon  
*CASA 2017*

## Patents

1. **System and Method for Localization for Non-line-of-sight Sound Source**  
[Inkyu An](#), Doheon Lee, Sung-Woo Choi, and Sung-Eui Yoon  
US, Registration Number/Date (US11353581B2 / 2022-06-07)
2. **System and Method for Localization for Non-line of-sight Sound Source Using Diffraction aware**  
[Inkyu An](#), Doheon Lee, Sung-Woo Choi, and Sung-Eui Yoon  
South Korea, Registration Number/Date (10-2174598-0000 / 2020-10-30)
3. **System and Method for Sound Source Localization Using Reflection aware**  
[Inkyu An](#), Myungbae Son, and Sung-Eui Yoon  
South Korea, Registration Number/Date (10-2105752-0000 / 2022-04-22)

## Media Coverages

1. **Interview of Young researcher in MERIC, 2020:**  
[https://www.materic.or.kr/v2/mp/content.asp?f\\_id=78&page=6&listType=20&s\\_kinds=&s\\_word=&listCnt=](https://www.materic.or.kr/v2/mp/content.asp?f_id=78&page=6&listType=20&s_kinds=&s_word=&listCnt=)
2. **2021 Annual R&D Report, KAIST:** Our back-propagation signal-based sound source localization techniques were chosen as research highlights of 2020 and covered in the Annual R&D Report
3. **2020 Annual R&D Report, KAIST:** Our diffraction- and reflection- aware sound source localization techniques were chosen as research highlights of 2019 and covered in the Annual R&D Report

## Research Activities

1. **A workshop at IEEE International Conference on Robotics and Automation (ICRA) 2019: Sound Source Localization and Its Application**  
Main organizer: Sung-Eui Yoon, Co-organizer: Dinesh Manocha, Publicity chair: [Inkyu An](#)
2. **A tutorial at KCC 2021: Sound Source Localization techniques for AI speakers and Robots**  
Speakers: Sung-Eui Yoon, [Inkyu An](#), Taeyoung Kim
3. **Teaching Assistant for Senior Data Scientist at Samsung SDS**  
Machine learning: Tree model and Recommendation, 2019-2020  
Lecturer: Sung-Eui Yoon  
Teaching Assistants: Woobin Im, Jaeyoon Kim, Heechan Shin, [Inkyu An](#)

## Experiments

1. **Research Internship at Korea Electronics Technology Institute (KETI)** 08/2013-07/2015  
Hardware design and Firmware
2. **Samsung Software Membership (Talent development program)** 06/2013-12/2015  
Supported by Samsung Electronics