

Yongsung Park

Applied Ocean Physics & Engineering, Woods Hole Oceanographic Institution

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EDUCATION	Seoul National University, Seoul, Korea Ph.D. (Integrated Ph.D. program), Naval Architecture and Ocean Engineering (Underwater acoustics), 2019 <ul style="list-style-type: none">▪ Dissertation title: “Grid-free compressive sensing with applications to underwater acoustic signal processing”▪ Advisor: Prof. Woojae Seong B.S., Naval Architecture and Ocean Engineering, 2013
RESEARCH INTERESTS	Underwater acoustics, Ocean engineering, Array signal processing, Sparse signal recovery, Statistical signal processing, Bayesian inference, Machine learning
RESEARCH EXPERIENCE	<div><div><i>Assistant Scientist</i></div><div>January 2025 – Present</div></div> <div><div>Applied Ocean Physics & Engineering, Woods Hole Oceanographic Institution</div><div><i>Assistant Project Scientist</i></div><div>March 2022 – January 2025</div></div> <div><div>Marine Physical Laboratory, Scripps Institution of Oceanography, University of California San Diego</div><div><i>Postdoctoral Scholar</i></div><div>October 2019 – February 2022</div></div> <div><div>Marine Physical Laboratory, Scripps Institution of Oceanography, University of California San Diego</div><div><i>Researcher</i></div><div>March 2019 – September 2019</div></div> <div><div>Research Institute of Marine Systems Engineering, Seoul National University</div><div><i>Visiting Scholar</i></div><div>February 2018 – July 2018</div></div> <div><div>Marine Physical Laboratory, Scripps Institution of Oceanography, University of California San Diego</div></div>
JOURNAL PUBLICATIONS	J. H. Lee, Y. Park , P. Gerstoft, and K. Lee, “Non-convex sparse beamformer,” <i>J. Acoust. Soc. Am.</i> , 157(5), pp. 3345-3357, 2025 J. H. Lee, Y. Park , and P. Gerstoft, “Generalized frequency-sum beamforming for low frequencies,” <i>J. Acoust. Soc. Am.</i> , 156(6), pp. 4037-4047, 2024 Y. Park , P. Gerstoft, and C. F. Mecklenbräuker, “Atom-constrained gridless DOA refinement with Wirtinger gradients,” <i>IEEE Open J. Signal Process.</i> , 5, pp. 1134-1146, 2024 J. H. Lee, Y. Park , P. Gerstoft, and Y. Kim, “Localization of partial electrical discharges using compressive spherical frequency-difference beamforming,” <i>J. Acoust. Soc. Am.</i> , 156(4), pp. 2838-2850, 2024 S. Yoon, Y. Park , K. Lee, and W. Seong, “Physics-informed neural networks in support

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- of modal wavenumber estimation,” *J. Acoust. Soc. Am.*, 156(4), pp. 2275-2286, 2024
- W. F. Jenkins, P. Gerstoft, and **Y. Park**, “Geoacoustic inversion using Bayesian optimization with a Gaussian process surrogate model,” *J. Acoust. Soc. Am.*, 156(2), pp. 812-822, 2024
- Y. Park** and P. Gerstoft, “Difference frequency gridless sparse array processing,” *IEEE Open J. Signal Process.*, 5, pp. 914-925, 2024
- C. F. Mecklenbräuker, P. Gerstoft, E. Ollila, and **Y. Park**, “Robust and Sparse M-Estimation of DOA,” *Signal Process.*, 220, 109461, 2024
- S. Yoon, **Y. Park**, P. Gerstoft, W. Seong, “Predicting ocean pressure field with a physics-informed neural network,” *J. Acoust. Soc. Am.*, 155(3), pp. 2037-2049, 2024
- W. F. Jenkins, P. Gerstoft, and **Y. Park**, “Bayesian optimization with Gaussian process surrogate model for source localization,” *J. Acoust. Soc. Am.*, 154(3), pp. 1459-1470, 2023
- J. H. Lee, **Y. Park**, and P. Gerstoft, “Compressive frequency-difference direction-of-arrival estimation,” *J. Acoust. Soc. Am.*, 154(1), pp. 141-151, 2023
- Y. Park** and F. Meyer, and P. Gerstoft, “Graph-based sequential beamforming,” *J. Acoust. Soc. Am.*, 153(3), pp. 723-737, 2023
- Y. Park** and J. H. Lee, and P. Gerstoft, “Difference-frequency MUSIC for DOAs,” *IEEE Signal Process. Lett.*, 29, pp. 2612-2616, 2022
- Y. Park** and P. Gerstoft, “Gridless sparse covariance-based beamforming via alternating projections including co-prime arrays,” *J. Acoust. Soc. Am.*, 151(6), pp. 3828-3837, 2022
- Y. Park**, F. Meyer, and P. Gerstoft, “Sequential sparse Bayesian learning for time-varying direction of arrival,” *J. Acoust. Soc. Am.*, 149(3), pp. 2089-2099, 2021
- M. Wagner, **Y. Park**, P. and Gerstoft, “Gridless DOA Estimation and Root-MUSIC for Non-Uniform Linear Arrays,” *IEEE Trans. Signal Process.*, 69, pp. 2144-2157, 2021
- Y. Park**, W. Seong, and P. Gerstoft, “Block-sparse two-dimensional off-grid beamforming with arbitrary planar array geometry,” *J. Acoust. Soc. Am.*, 147(4), pp. 2184-2191, 2020
- M. Park, **Y. Park**, K. Lee, and W. Seong, “Incipient tip vortex cavitation localization using block-sparse compressive sensing,” *J. Acoust. Soc. Am.*, 147(5), pp. 3454-3464, 2020
- Y. Choo, **Y. Park**, and W. Seong, “Detection of direction-of-arrival in time domain using compressive time-delay estimation with single and multiple measurements,” *Sensors*, 20, pp. 5431-5454, 2020
- Y. Park**, P. Gerstoft, and W. Seong, “Grid-free compressive mode extraction,” *J. Acoust. Soc. Am.*, 145(3), pp. 1427-1442, 2019
- Y. Park**, Y. Choo, and W. Seong, “Multiple snapshot grid free compressive beamforming,” *J. Acoust. Soc. Am.*, 143(6), pp. 3849-3859, 2018
- Y. Park**, W. Seong, and Y. Choo, “Compressive time delay estimation off the grid,” *J. Acoust. Soc. Am.*, 141(6), pp. EL585-EL591, 2017

- Y. Park**, P. Gerstoft, S. Yoon, and W. Seong, “Physics-informed neural networks for ocean acoustic field prediction with envelope smoothing,” 2025 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Hyderabad, India, 2025
- P. Gerstoft and **Y. Park**, “Atom-Constrained Maximum Likelihood Gridless DOA with Wirtinger Gradients,” 2025 IEEE International Conference on Acoustics, Speech and
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Signal Processing (ICASSP), Hyderabad, India, 2025

Y. Park, P. Gerstoft, Y. Wu, and M. B. Wakin, “Atomic norm denoising for multi-frequency-snapshot DOA estimation,” 2024 IEEE 13rd Sensor Array and Multichannel Signal Processing Workshop (SAM), Corvallis, USA, 2024

Y. Wu, M. B. Wakin, P. Gerstoft, and **Y. Park**, “Non-uniform frequency spacing for regularization-free gridless DOA,” 2024 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Seoul, Korea, 2024

C. F. Mecklenbräuker, P. Gerstoft, E. Ollila, and **Y. Park**, “Robust sparse Bayesian learning for DOA,” 2023 31st European Signal Processing Conference (EUSIPCO), Helsinki, Finland, 2023

Y. Park, F. Meyer, and P. Gerstoft, “Learning-aided initialization for variational Bayesian DOA estimation,” 2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Singapore, Singapore, 2022

Y. Park and P. Gerstoft, “Alternating projections gridless covariance-based estimation for DOA,” 2021 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Toronto, Canada, 2021

F. Meyer, **Y. Park**, and P. Gerstoft, “Variational Bayesian Estimation of Time-Varying DOAs,” 2020 IEEE 23rd International Conference on Information Fusion (FUSION), Rustenburg, South Africa, 2020

Y. Park, F. Meyer, and P. Gerstoft, “Sequential sparse Bayesian learning for DOA,” 2020 54th Annual Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, USA, 2020

Y. Park and P. Gerstoft, “Compressive 2-d Off-grid DOA Estimation for Propeller Cavitation Localization,” 2020 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Barcelona, Spain, 2020

M. Wagner, P. Gerstoft, and **Y. Park**, “Gridless DOA Estimation via. Alternating Projections,” 2019 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Brighton, United Kingdom, 2019

AWARDS
MINI-GRANTS

Travel grant to attend the Early-career Acousticians Retreat (EAR 2022), Nashville, USA, 2022

Travel grant to attend the 183rd Meeting of the Acoustical Society of America (ASA), Nashville, USA, 2022

Best paper award, Acoustical Society of Korea meeting, Changwon, Korea, 2017

Best paper award (CNO, Chief of Naval Operation in the R.O.K Navy), Naval Weapon Systems Symposium, Jeju, Korea, 2017

SCHOLARSHIPS

Brain Korea 21 Plus Research Scholarship, Naval Architecture and Ocean Engineering, Seoul National University, 2015 – 2019

Education and Research Foundation College of Engineering SNU Scholarship, Seoul National University, 2014 – 2015

Education and Research Center for Creative Offshore Plant Engineers Scholarship, Seoul

National University, 2014

Scholarships granted by Engineering college, Naval Architecture and Ocean Engineering, Seoul National University, 2013 – 2014

Superior Academic Performance, Seoul National University, 2012

SNU Development Fund Scholarship, Seoul National University, 2012

Superior Academic Performance, Seoul National University, 2011

Eminence Scholarship, Seoul National University, 2011

Superior Academic Performance, Seoul National University, 2010

National Scholarship for Science and Engineering, Korea, 2009

PROFESSIONAL
ACTIVITIES

Professional society memberships:

- Acoustical Society of America (full member)
- IEEE, Signal Processing Society

Special session organizing chair:

- 186th Meeting of the Acoustical Society of America, Ottawa, 2024

Meeting organizing committee:

- 178th Meeting of the Acoustical Society of America, San Diego, 2019

Invited talks:

- Woods hole Oceanographic Institution (WHOI) Seminar, WHOI, 2024
- Eco-friendly smart ship seminar, Seoul National University (SNU), 2022
- Korea Maritime and Ocean University (KMOU), 2022
- Sejong University, 2022
- Eco-friendly smart ship seminar, SNU, 2020
- Applied Ocean Science (AOS) seminar, Scripps Institution of Oceanography, 2020
- Sejong University, 2019

Workshops:

- Early-career Acousticians Retreat (EAR 2022), Nashville, USA, 2022

Journal referee for:

- Journal of the Acoustical Society of America
 - IEEE Journal of Oceanic Engineering
 - IEEE Transactions on Signal Processing
 - IEEE Signal Processing Letters
 - Signal Processing (Elsevier)
 - IEEE Transactions on Communications
 - IEEE Transactions on Wireless Communications
 - IEEE Transactions on Aerospace and Electronic Systems
 - IEEE Transactions on Audio, Speech and Language Processing
 - IEEE Transactions on Vehicular Technology
 - IEEE Transactions on Circuits and Systems I
 - IEEE Access
 - ISIF Journal of Advances in Information Fusion
 - Journal of the Franklin Institute
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- Mechanical Systems and Signal Processing (Elsevier)
 - Measurement (Elsevier)
 - Nature Scientific Reports
 - Shock and Vibration
 - Journal of Theoretical and Computational Acoustics
 - International Journal of Naval Architecture and Ocean Engineering
 - Journal of Marine Science and Technology-Taiwan
 - IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)
 - IEEE Sensor Array and Multichannel Signal Processing Workshop (SAM)
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CONFERENCE
PRESENTATIONS

Y. Park, P. Gerstoft, S. Yoon, and W. Seong, "Physics-informed neural networks for ocean acoustic field prediction with envelope smoothing," 2025 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Hyderabad, India, 2025

P. Gerstoft and Y. Park, "Atom-Constrained Maximum Likelihood Gridless DOA with Wirtinger Gradients," 2025 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Hyderabad, India, 2025

Y. Park, P. Gerstoft, Y. Wu, and M. B. Wakin, "Atomic norm denoising for multi-frequency-snapshot DOA estimation," 2024 IEEE 13rd Sensor Array and Multichannel Signal Processing Workshop (SAM), Corvallis, USA, 2024

Y. Park, S. Yoon, P. Gerstoft, and W. Seong, "Physics-informed neural network-based predictions of ocean acoustic pressure fields," 186th Meeting of the Acoustical Society of America (ASA), Ottawa, Canada, 2024 [**Invited**]

Y. Park and P. Gerstoft, "Frequency-difference beamforming and sparse processing," 186th Meeting of the Acoustical Society of America (ASA), Ottawa, Canada, 2024 [**Invited**]

W. F. Jenkins, P. Gerstoft, and Y. Park, "Bayesian optimization for geoacoustic inversion," 186th Meeting of the Acoustical Society of America (ASA), Ottawa, Canada, 2024

Y. Wu, M. B. Wakin, P. Gerstoft, and Y. Park, "Non-uniform frequency spacing for regularization-free gridless DOA," 2024 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Seoul, Korea, 2024

S. Yoon, Y. Park, P. Gerstoft, and W. Seong, "Improving mode extraction with physics-informed neural network," 185th Meeting of the Acoustical Society of America (ASA) with the Australian Acoustical Society and WESPAC, Sydney, Australia, 2023

S. Yoon, Y. Park, and W. Seong, "Physics-informed neural network for predicting unmeasured ocean acoustic pressure field," 185th Meeting of the Acoustical Society of America (ASA) with the Australian Acoustical Society and WESPAC, Sydney, Australia, 2023

W. F. Jenkins, P. Gerstoft, and Y. Park, "Acoustic source localization using Bayesian optimization with a Gaussian process surrogate model," 184th Meeting of the Acoustical Society of America (ASA), Chicago, USA, 2023

Y. Park and P. Gerstoft, "Difference-Frequency MUSIC for DOAs," 2023 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Rhodes, Greece, 2023

Y. Park and P. Gerstoft, "Difference-frequency MUSIC for beamforming," 184th Meeting

of the Acoustical Society of America (ASA), Chicago, USA, 2023

Y. Park and P. Gerstoft, "Alternating projections-based gridless compressive beamforming with co-prime arrays," 183rd Meeting of the Acoustical Society of America (ASA), Nashville, USA, 2022

Y. Park and P. Gerstoft, "Gridless sparse DOA estimation for ocean acoustic localization," 24th International Congress on Acoustics (ICA), Gyeongju, Korea, 2022 **[Invited]**

Y. Park, F. Meyer, and P. Gerstoft, "Learning-aided initialization for variational Bayesian DOA estimation," 2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Singapore, Singapore, 2022

Y. Park, F. Meyer, and P. Gerstoft, "Variational Bayesian inference for beamforming," 181st Meeting of the Acoustical Society of America (ASA), Seattle, USA, 2021

Y. Park, F. Meyer, and P. Gerstoft, "Sequential sparse Bayesian learning for beamforming," 180th Meeting of the Acoustical Society of America (ASA), Virtual, 2021 **[Invited]**

Y. Park and P. Gerstoft, "Alternating projections gridless covariance-based estimation for DOA," 2021 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Toronto, Canada, 2021

Y. Park, F. Meyer, and P. Gerstoft, "Sparse Bayesian learning for Time-Varying DOA estimation," 179th Meeting of the Acoustical Society of America (ASA), Virtual, 2020 **[Invited]**

F. Meyer, Y. Park, and P. Gerstoft, "Variational Bayesian Estimation of Time-Varying DOAs," 2020 IEEE 23rd International Conference on Information Fusion (FUSION), Rustenburg, South Africa, 2020

Y. Park, F. Meyer, and P. Gerstoft, "Sequential sparse Bayesian learning for DOA," 2020 54th Annual Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, USA, 2020 **[Invited]**

Y. Park and P. Gerstoft, "Compressive 2-d Off-grid DOA Estimation for Propeller Cavitation Localization," 2020 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Barcelona, Spain, 2020

Y. Park, P. Gerstoft, and W. Seong, "Compressive two-dimensional beamforming for localization of tip vortex cavitation," 178th Meeting of the Acoustical Society of America (ASA), San Diego, USA, 2019

M. Park, W. Seong, Y. Choo, and Y. Park, "Block-sparse compressive localization for incipient tip vortex cavitation noise," 178th Meeting of the Acoustical Society of America (ASA), San Diego, USA, 2019

M. Wagner, P. Gerstoft, and Y. Park, "Gridless DOA Estimation via Alternating Projections," 2019 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Brighton, United Kingdom, 2019

Y. Park, M. Wagner, W. Seong, and P. Gerstoft, "Grid-free compressive DOA estimation via alternating projection," 176th Meeting of the Acoustical Society of America (ASA), Victoria, Canada, 2018

Y. Park, P. Gerstoft, and W. Seong, "Compressive normal mode extraction in shallow water," 176th Meeting of the Acoustical Society of America (ASA), Victoria, Canada, 2018

Y. Park, Y. Choo, and W. Seong, "Off-the-grid direction-of-arrival estimation with multiple measurement vectors," 174th Meeting of the Acoustical Society of America (ASA), New Orleans, USA, 2017

Y. Choo, Y. Park, and W. Seong, "Compressive time-domain beamforming," Proc. IEEE OES International Symposium on Underwater Technology (UT), Busan, Korea, 2017

Y. Park, Y. Choo, and W. Seong, "Off the grid time delay estimation for sparse translation-invariant signals," 4th International Workshop on Compressed Sensing Theory and its Applications to Radar, Sonar and Remote Sensing (CoSeRa), Aachen, Germany, 2016

Y. Choo, J. Park, Y. Park, M. Park, and W. Seong, "Grid-free channel estimation of acoustic measurement data from SAVEX15," 172nd Meeting of the Acoustical Society of America (ASA), Honolulu, USA, 2016

Y. Park and W. Seong, "High resolution direction-of-arrivals using extended multipath matching pursuit," 3rd International Workshop on Compressed Sensing Theory and its Applications to Radar, Sonar and Remote Sensing (CoSeRa), Pisa, Italy, 2015

Y. Park and W. Seong, "Direction-of-arrival estimation using compressive sensing," 1st Conference on New Advances in Acoustics (NAA), Shanghai, China, 2015

PROJECTS

"Application of compressive sensing to sonar signal processing," supported by the Agency for Defense Development, Korea (October 2016 – September 2019)

"Multi-beam signal processing and compressive sensing," supported by the Defense Acquisition Program Administration, Korea (March 2019 – September 2019)

"Machine learning and sparse processing in support of geoacoustic inversion," supported by the Office of Naval Research (ONR) U.S. Navy Task Force Ocean, USA (September 2019 – January 2025)
