Won-Kwang Park

Summary

· Full Professor
· Department of Information Security, Cryptology, and Mathematics
· College of Science and Technology, Kookmin University
· 77, Jeongneung-ro, Seongbuk-gu, Seoul, 02707, Korea
· E-mail: parkwk@kookmin.ac.kr
· Personal Webpage: https://sites.google.com/view/parkwk/
· Office: No. 714, Building E4, Kookmin University
· Scientific Computing Lab: No. 214, Building N6, Kookmin University

Personal Information

· Born April 7, 1975, in Seoul, Republic of Korea

Education

Doctor of Philosophy - Centre de Mathématiques Appliquées, École Polytechnique 2006 – 2009
· In cooperation with Laboratoire des Signaux et Systèmes, Ecole Supérieure d'Electricité
· Thesis title (Français): Diffraction inverse par des inclusions minces et des fissures
· hesis title (English): Inverse scattering from two-dimensional thin inclusions and cracks
· Advisors: Habib Ammari and Dominique Lesselier
· Jury members: Elena Beretta, Oliver Dorn, François Jouve, Roman Novikov, and Knut Sølna
· Appreciation: Très honorable (highly honorable).

Master Degree - Department of Mathematics, Yonsei University 2002 - 2004
· Thesis title: Partial differential equations in image processing
· Advisor: Jin Keun Seo

Bachelor Degree - Department of Mathematical Education, Kookmin University 1994 – 2000

Employments

Full Professor - Kookmin University Since 2010
· Department of Information Security, Cryptology, and Mathematics Since March 2020
· Adjunct Professor, Graduated School of Education March 2020 – February 2022
· Associate Professor, Department of Mathematics March 2015 – February 2020
· Assistant Professor, Department of Mathematics March 2012 – February 2015
· Full-Time Lecturer, Department of Mathematics March 2010 – February 2012

Postdoctoral Researcher - Karl Franzens Universität Graz 2009
· Institute of Mathematics and Scientific Computing July 2009 – December 2009

Awards

Best Paper Awards - Domestic & International Conferences Since 2008
· Conférence annuelle de l'ASCoF 2008
· Conférence annuelle de l'ASCoF 2009 (with Hyundae Lee)

· EKC 2009 (with Dominique Lesselier)
· The 14th ICFICE, 2022 (with Seongje Chae and Young-Deuk Joh)

Best Poster Awards - Domestic & International Conferences — Since 2013
· Spring conference of the KSIAM 2013 (with Young-Deuk Joh)
· Annual meeting of the KSIAM 2013 (with Young-Deuk Joh and Young Mi Kwon)
· Summer conference of the KIEES 2015 (with Jung Ho Park)
· Summer conference of the KIEES 2016 (with Hyeoncheol Jo, Kyungrok Lee, and Young-Deuk Joh)
· EKC 2022 (with Seongje Chae)
· Summer conference of the KIEES 2022 (with Seongje Chae and Sangwoo Kang)

Excellence in Academic Research Support Projects - NRF — 2020
· 2020 Top 50 Excellence Researches in Academic Research Support Projects

Responsibilities & Activities

Reviewer - Selected International Journals — Since 2009
· Computers & Mathematics with Applications, Digital Signal Processing
· ESAIM: Mathematical Modeling and Numerical Analysis (M2AN), IEEE Transactions on Computational Imaging
· Inverse Problems, Inverse Problems and Imaging, Inverse Problems in Science & Engineering
· Journal of Computational Physics, Journal of Inverse and Ill-Posed Problems
· Mathematics and Computers in Simulation, Mechanical Systems and Signal Processing
· Radio Science, SIAM Journal on Imaging Sciences

Invited Speaker - International Conferences
· Europe-Korea Conference on Science and Technology 2018 — August 2018
· IEEE AP–S Fukuoka Chapter — September 2018
· 71st Joint Conference of Electrical, Electronics and Information Engineers in Kyushu — September 2018

Academic Activities & Research Projects

Teaching Assistant - Department of Mathematics, Yonsei University — 2002–2005

Visiting Researches — Since 2005
· Centre de Mathématiques Appliquées, Ecole Polytechnique — February 2005 – January 2006
· Department of Computational Science and Engineering, Yonsei University — Since January 2010
· Laboratoire des Signaux et Systèmes, Ecole Supérieure d'Electricité — Since 2012
· National Institute for Mathematical Sciences — Since 2014
· Département de Mathématiques et Applications, Ecole Normale Supérieure — January 2015
· Génie électrique et électronique de Paris, CentraleSupélec — Since 2017
· Department of Mathematics, Eidgenössische Technische Hochschule Zürich (ETH Zürich) — Since 2018
· Korea Advanced Institute of Science and Technology — Since March 2021

Research Projects — Since 2011
· Basic Science Research Program of the NRF — May 2011 – April 2014
· Basic Science Research Program of the NRF — November 2014 – April 2017
· Commissioned Research of the NIMS — May 2015 – October 2015
· Research & Education in Gyeonggi Science High School for the Gifted — April 2017 – December 2017
· Basic Science Research Program of the NRF (follow-up research) — June 2017 – October 2020
· A3 Foresight Program of the NRF (participating researcher) — November 2017 – December 2018

· Commissioned Research of the ETRI (participating researcher) June 2019 – November 2019
· Basic Science Research Program of the NRF Since March 2020

Current Team Member

MinYeob Lee - B. S. Candidate, Kookmin University Since 2023

Former Team Members

Young-Deuk Joh - Ph.D. Degree, Kookmin University 2012–2015
· Teacher, Pyeongchon High School
· Thesis Title: Mathematical analysis of MUSIC and subspace migration for imaging of perfectly conducting cracks and thin electromagnetic inclusions
· Received excellent thesis prize in Graduated school

Seongje Chae - Ph.D. Degree, Kookmin University 2020–2023
· Team Leader, DT Analytics, Corp. DI, CJ Cheiljedang
· Thesis Title: Analysis and application of the orthogonality sampling method in microwave imaging
· Received excellent thesis prize in Graduated school

Joo Young Huh - Master Degree, Kookmin University 2012–2014
· Thesis Title: Mathematical analysis of subspace migration imaging function and its improvement

Young Mi Kwon - Master Degree, Kookmin University 2012–2014
· Thesis Title: Mathematical analysis of subspace migration in full- and limited-view inverse scattering problems
· Received excellent thesis prize in Graduated school

Sangwoo Kang - Bachelor Degree, Kookmin University 2011–2013
· Senior researcher at Advanced Defense Science & Technology Research Institute, Agency for Defense Development in Korea
· Received Ph.D. degree from Génie électrique et électronique de Paris (GeePs), CentraleSupélec, Université Paris-Sud

Jung Ho Park - Bachelor Degree, Kookmin University 2014–2015
· Ph.D. Candidate in Department of Mathematical Sciences, Seoul National University

Kyungrok Lee - Bachelor Degree, Kookmin University 2016–2017
· Ph.D. Candidate in Department of Computational Science and Engineering, Yonsei University

Hyeoncheol Jo - Bachelor Degree, Kookmin University 2016–2018
· Ph.D. Candidate in Department of Computational Science and Engineering, Yonsei University

Taekyung Ki - Bachelor Degree, Kookmin University 2018–2019
· Received M.S. degree from Department of Mathematics, Yonsei University

Published Research Articles

[A1] Won-Kwang Park and Dominique Lesselier, **MUSIC-type imaging of a thin penetrable inclusion from its far-field multi-static response matrix**, *Inverse Problems*, **25**, Article No. 075002, 2009.

[A2] Hyundae Lee and Won-Kwang Park, **Location search algorithm of thin conductivity inclusions via boundary measurements**, *ESAIM: Proceedings*, **26**, 217–229, 2009.

[A3] Won-Kwang Park and Dominique Lesselier, **Reconstruction of thin electromagnetic inclusions by a level set method**, *Inverse Problems*, **25**, Article No. 085010, 2009.

[A4] Won-Kwang Park and Dominique Lesselier, **Electromagnetic MUSIC-Type imaging of perfectly conducting, arc-like cracks at single frequency**, *Journal of Computational Physics*, **228** (21), 8093–8111, 2009.

[A5] Habib Ammari, Hyeonbae Kang, Hyundae Lee, and Won-Kwang Park, **Asymptotic imaging of perfectly conducting cracks**, *SIAM Journal on Scientific Computing*, **32** (2), 894–922, 2010.

[A6] Won-Kwang Park, **On the imaging of thin dielectric inclusions buried within a half-space**, Special issue on electromagnetic inverse problems: emerging methods and novel applications, *Inverse Problems*, **26**, Article No. 074008, 2010.

[A7] Won-Kwang Park, **Non-iterative imaging of thin electromagnetic inclusions from multi-frequency response matrix**, *Progress in Electromagnetics Research*, **106**, 225–241, 2010.

[A8] Won-Kwang Park, **On the imaging of thin dielectric inclusions via topological derivative concept**, *Progress in Electromagnetics Research*, **110**, 237–252, 2010.

[A9] Habib Ammari, Josselin Garnier, Hyeonbae Kang, Won-Kwang Park, and Knut Sølna, **Imaging schemes for perfectly conducting cracks**, *SIAM Journal on Applied Mathematics*, **71** (1), 68–91, 2011.

[A10] Won-Kwang Park, **Topological derivative for fast imaging of two dimensional thin dielectric inclusions in the wave propagation environment**, *Journal of Electromagnetic Engineering and Science*, **11** (1), 56–61, 2011.

[A11] Yong-Ki Ma, Pok-Son Kim, and Won-Kwang Park, **Analysis of topological derivative function for a fast electromagnetic imaging of perfectly conducing cracks**, *Progress in Electromagnetics Research*, **122**, 311–325, 2012.

[A12] Won-Kwang Park and Dominique Lesselier, **Fast electromagnetic imaging of thin inclusions in half-space affected by random scatterers**, Special issue on imaging in complex media, *Waves in Random and Complex Media*, **22** (1). 3–23, 2012.

[A13] Won-Kwang Park, **Topological derivative strategy for one-step iteration imaging of arbitrary shaped thin, curve-like electromagnetic inclusions**, *Journal of Computational Physics*, **231** (4), 1426–1439, 2012.

[A14] Yong-Ki Ma and Won-Kwang Park, **A topological derivative based non-iterative electromagnetic imaging of perfectly conducting cracks**, *Journal of Electromagnetic Engineering and Science*, **12** (1), 128–134, 2012.

[A15] Young-Deuk Joh, Young Mi Kwon, Joo Young Huh, and Won-Kwang Park, **Structure analysis of single- and multi-frequency subspace migrations in inverse scattering problems**, *Progress in Electromagnetics Research*, **136**, 607–622, 2013.

[A16] Won-Kwang Park and Taehoon Park, **Multi-frequency based direct location search of small electromagnetic inhomogeneities embedded in two-layered medium**, *Computer Physics Communications*, **184** (7), 1649–1659, 2013.

[A17] Young-Deuk Joh and Won-Kwang Park, **Structural behavior of the MUSIC-type algorithm for imaging perfectly conducting cracks**, *Progress in Electromagnetics Research*, **218**, 211–226, 2013.

[A18] Won-Kwang Park, **Multi-frequency topological derivative for an approximate shape acquisition of curve–like thin electromagnetic inhomogeneities**, *Journal of Mathematical Analysis and Applications*, **404** (2), 501–518, 2013.

- Dedicated to professor Dominique Lesselier for his 60th birthday.

[A19] Young Mi Kwon and Won-Kwang Park, **Analysis of subspace migration in the limited-view inverse scattering problems**, *Applied Mathematics Letters*, **26** (12), 1107–1113, 2013.

[A20] Won-Kwang Park, **Shape reconstruction of thin electromagnetic inclusions via boundary measurements: level-set method combined with topological derivative**, *Mathematical Problems in Engineering*, **2013**, Article No. 125909, 2013.

[A21] Won-Kwang Park, **Analysis of a multi-frequency electromagnetic imaging functional for thin, crack-like electromagnetic inclusions**, *Applied Numerical Mathematics*, **77** 31–42, 2014.

[A22] Won-Kwang Park, **Improved subspace migration for imaging of small and arc-like perfectly conducting cracks**, *Journal of Electromagnetic Waves and Applications*, **28** (4), 410–419, 2014.

[A23] Young-Deuk Joh, Young Mi Kwon, and Won-Kwang Park, **MUSIC-type imaging of perfectly conducting cracks in limited-view inverse scattering problems**, *Applied Mathematics and Computation*, **240**, 273–280, 2014.

[A24] Won-Kwang Park, **Properties of MUSIC-type algorithm for imaging of thin dielectric inhomogeneity in limited-view inverse scattering problem**, *Progress In Electromagnetics Research M*, **37**, 109–118, 2014.

[A25] Chi Young Ahn, Kiwan Jeon, Yong-Ki Ma, and Won-Kwang Park, **A study on the topological derivative-based imaging of thin electromagnetic inhomogeneities in limited-aperture problems**, *Inverse Problems*, **30** (10), 105004, 2014.

[A26] Young-Deuk Joh and Won-Kwang Park, **Analysis of multi-frequency subspace migration weighted by natural logarithmic function for fast imaging of two-dimensional thin, arc-like electromagnetic inhomogeneities**, *Computers & Mathematics with Applications*, **68** (12A), 1892–1904, 2014.

[A27] Won-Kwang Park, **Multi-frequency subspace migration for imaging of perfectly conducting, arc-like cracks in full- and limited-view inverse scattering problems**, *Journal of Computational Physics*, **283**, 52–80, 2015.

[A28] Jung Ho Park and Won-Kwang Park, **Localization of small perfectly conducting cracks from far-field pattern with unknown frequency**, *Applied Mathematics Letters*, **43**, 25–32, 2015.

[A29] Won-Kwang Park, **Asymptotic properties of MUSIC-type imaging in two-dimensional inverse scattering from thin electromagnetic inclusions**, *SIAM Journal on Applied Mathematics*, **75** (1), 209–228, 2015.

[A30] Chi Young Ahn, Kiwan Jeon, and Won-Kwang Park, **Analysis of MUSIC-type imaging functional for single, thin electromagnetic inhomogeneity in limited-view inverse scattering problem**, *Journal of Computational Physics*, **291**, 198–217, 2015.

[A31] Yong-Ki Ma and Won-Kwang Park, **Analysis of MUSIC-type imaging functionals for small two-dimensional electromagnetic inhomogeneities**, *Journal of Electromagnetic Waves and Applications*, **29**, 1430–1439, 2015.

[A32] Won-Kwang Park, **Negative result of multi-frequency topological derivative based imaging in limited-aperture inverse scattering problem**, *Results in Physics*, **6**, 14–15, 2016.

[A33] Won-Kwang Park, **Interpretation of MUSIC for location detecting of small inhomogeneities surrounded by random scatterers**, *Mathematical Problems in Engineering*, **2016**, Article No. 7872548, 2016.

[A34] Won-Kwang Park, **Detection of small electromagnetic inhomogeneities with inaccurate frequency**, *Journal of the Korean Physical Society*, **68** (5), 607–615, 2016.

[A35] Won-Kwang Park, **Performance analysis of multi-frequency topological derivative for reconstructing perfectly conducting cracks**, *Journal of Computational Physics*, **335**, 865–884, 2017.

- Dedicated to professor Chang Bum Kim on the occasion of his retirement.

[A36] Won-Kwang Park, **Appearance of inaccurate results in the MUSIC algorithm with inappropriate wavenumber**, *Journal of Inverse and Ill-Posed Problems*, **25**, 807–817, 2017.

[A37] Won-Kwang Park, **Certain properties of MUSIC-type imaging functional in inverse scattering from an open, sound-hard arc**, *Computers & Mathematics with Applications*, **74**, 1232–1245, 2017.

[A38] Won-Kwang Park, Hwa Pyung Kim, Kwang-Jae Lee, and Seong-Ho Son, **MUSIC algorithm for location searching of dielectric anomalies from S-parameters using microwave imaging**, *Journal of Computational Physics*, **348**, 259–270, 2017.

[A39] Won-Kwang Park, **A novel study on subspace migration for imaging of a sound-hard arc**, *Computers & Mathematics with Applications*, **74**, 3000–3007, 2017.

[A40] Won-Kwang Park, **Topological derivative-based technique for imaging thin inhomogeneities with few incident directions**, *Inverse Problems in Science & Engineering*, **26**, 1490–1508, 2018.

- Dedicated to professor Jae-Ryong Kim on the occasion of his retirement.

[A41] Won-Kwang Park, **Detection of small inhomogeneities via direct sampling method in transverse electric polarization**, *Applied Mathematics Letters*, **79**, 169–175, 2018.

[A42] Won-Kwang Park, **Topological derivative for imaging of thin electromagnetic inhomogeneity: least condition of incident directions**, *Advances in Mathematical Physics*, **2018**, Article No. 2096058, 2018.

[A43] Won-Kwang Park, **Direct sampling method for anomaly imaging from scattering parameter**, *Applied Mathematics Letters*, **81**, 63–71, 2018.

[A44] Sangwoo Kang, Marc Lambert, and Won-Kwang Park, **Direct sampling method for imaging small dielectric inhomogeneities: analysis and improvement**, *Inverse Problems*, **34**, Article No. 095005, 2018.

[A45] Won-Kwang Park, **Reconstruction of thin electromagnetic inhomogeneity without diagonal elements of a multi-static response matrix**, *Inverse Problems*, **34**, Article No. 095008, 2018.

[A46] Won-Kwang Park, **Direct sampling method for retrieving small perfectly conducting cracks**, *Journal of Computational Physics*, **373**, 648–661, 2018.

[A47] Won-Kwang Park, **Fast identification of small perfectly conducting cracks without diagonal elements of Multi-Static Response matrix**, *Journal of Electromagnetic Waves and Applications*, **32** (18), 2490–2502, 2018.

[A48] Won-Kwang Park, **Real-time microwave imaging of unknown anomalies via scattering matrix**, *Mechanical Systems and Signal Processing*, **118**, 658–674, 2019.

[A49] Won-Kwang Park, **Improvement of direct sampling method in transverse electric polarization**, *Applied Mathematics Letters*, **88**, 209–215, 2019.

[A50] Won-Kwang Park, **Negative result of multi-frequency direct sampling method in microwave imaging**, *Results in Physics*, **12**, 859–860, 2019.

[A51] Won-Kwang Park, **Fast location search of small anomaly by using microwave**, *International Journal of Applied Electromagnetics and Mechanics*, **59** (4), 1505–1510, 2019.

[A52] Sangwoo Kang, Marc Lambert, and Won-Kwang Park, **Analysis and improvement of direct sampling method in the mono-static configuration**, *IEEE Geoscience and Remote Sensing Letters*, **16** (11), 1721–1725, 2019.

[A53] Seong-Ho Son, Kwang-Jae Lee, and Won-Kwang Park, **Application and analysis of direct sampling method in real-world microwave imaging**, *Applied Mathematics Letters*, **96**, 47–53, 2019.

[A54] Won-Kwang Park, **Fast imaging of short perfectly conducting cracks in limited-aperture inverse scattering problem**, Special issue on microwave imaging and its application, *Electronics*, **8** (9), Article No. 1050, 2019.

[A55] Chi Young Ahn, Taeyoung Ha, and Won-Kwang Park, **Kirchhoff migration for identifying unknown targets surrounded by random scatterers**, *Applied Sciences*, **9** (20), Article No. 4446, 2019.

[A56] Won-Kwang Park, **Experimental validation of the factorization method to microwave imaging**, *Results in Physics*, **17**, Article No. 103071, 2020.

[A57] Kwang-Jae Lee, Seong-Ho Son, and Won-Kwang Park, **A real-time microwave imaging of unknown anomaly with and without diagonal elements of scattering matrix**, *Results in Physics*, **17**, Article No. 103104, 2020.

[A58] Won-Kwang Park, **Fast imaging of thin, curve-like electromagnetic inhomogeneities without a priori information**, *Mathematics*, **8**(5), Article No. 799, 2020.

[A59] Sangwoo Kang, Marc Lambert, Chi Young Ahn, Taeyoung Ha, and Won-Kwang Park, **Single- and multi-frequency direct sampling methods in limited-aperture inverse scattering problem**, *IEEE Access*, **8**, 121637–121649, 2020.

[A60] Seongje Chae, Chi Young Ahn, and Won-Kwang Park, **Localization of small anomalies via orthogonality sampling method from scattering parameters**, Special issue on photonic and microwave sensing developments and applications, *Electronics*, 9(7), Article No. 1119, 2020.

[A61] Chi Young Ahn, Seongje Chae, and Won-Kwang Park, **Fast identification of short, sound-soft open arcs via orthogonality sampling method in limited-aperture inverse scattering problem**, *Applied Mathematics Letters*, **109**, Article No. 106556, 2020.

[A62] Chi Young Ahn, Taeyoung Ha, and Won-Kwang Park, **Direct sampling method for identifying magnetic inhomogeneities in limited-aperture inverse scattering problem**, *Computers & Mathematics with Applications*, **80** (12), 2811–2829, 2020.

[A63] Won-Kwang Park, **Application of the MUSIC algorithm in real-world microwave imaging of unknown anomalies from scattering matrix**, *Mechanical Systems and Signal Processing*, **153**, Article No. 107501, 2021.

- Dedicated to professor Jin Keun Seo on the occasion of his 60th birthday.

[A64] Won-Kwang Park, **Performance improvement of single- and multi-frequency direct sampling methods in microwave imaging**, *Results in Physics*, **20**, Article No. 103727, 2021.

[A65] Won-Kwang Park, **Theoretical identification of coupling effect and performance analysis of single-source direct sampling method**, *Mathematics*, **9** (9), Article No. 1065, 2021.

[A66] Won-Kwang Park, **Accurate identification of multiple anomalies in microwave imaging via direct sampling method with multiple sources**, *Results in Physics*, **28**, Article No. 104637, 2021.

[A67] Won-Kwang Park, **Fast localization of small inhomogeneities from far-field pattern data in limited-aperture inverse scattering problem**, *Mathematics*, **9** (17), Article No. 2087, 2021.

[A68] Sangwoo Kang, Seongje Chae, and Won-Kwang Park, **A study on the orthogonality sampling method corresponding to the observation directions configuration**, *Results in Physics*, **33**, Article No. 105108, 2022.

[A69] Won-Kwang Park, **Real-time detection of small anomaly from limited-aperture measurements in real–world microwave imaging**, *Mechanical Systems and Signal Processing*, **171**, Article No. 108937, 2022.

[A70] Won-Kwang Park, **A novel study on the MUSIC-type imaging of small electromagnetic inhomogeneities in the limited-aperture inverse scattering problem**, *Journal of Computational Physics*, **460**, Article No. 111191, 2022.

[A71] Sangwoo Kang and Won-Kwang Park, **Application of MUSIC algorithm for a fast identification of small perfectly conducting cracks in limited-aperture inverse scattering problem**, *Computers & Mathematics with Applications*, **117**, 97–112, 2022.

[A72] Won-Kwang Park, **Theoretical study on non-improvement of the multi-frequency direct sampling method in inverse scattering problem**, *Mathematics*, **10** (10), Article No. 1674, 2022.

[A73] Won-Kwang Park, **Investigation of a non-iterative technique based on topological derivatives for fast localization of small conductivity inclusions**, *Computers & Mathematics with Applications*, **120**, 45–59, 2022.

[A74] Sangwoo Kang, Mikyoung Lim, and Won-Kwang Park, **Fast identification of short, linear perfectly conducting cracks in the bistatic measurement configuration**, *Journal of Computational Physics*, 468, Article No. 111479, 2022.

[A75] Seong-Ho Son and Won-Kwang Park, **Localization of small objectives from scattering parameter via bistatic measurement configuration**, Special issue on Biomedical Applications of Micro/Millimeter Waves, *Electronics*, **11** (19), Article No. 3054, 2022.

[A76] Sang-Su Jeong, Won-Kwang Park, and Young-Deuk Joh, **Construction of full-view data from limited-view data using artificial neural network in inverse scattering problem**, Special issue on Future Information & Communication Engineering 2022, *Applied Sciences*, **12** (19), Article No. 9801, 2022.

[A77] Wonhyung Son, Won-Kwang Park, and Seong-Ho Son, **A neural network-based microwave imaging method for object localization**, *Journal of Electromagnetic Engineering and Science*, **22** (5), 576–579, 2022.

[A78] Won-Kwang Park, **Shape identification of open sound-hard arcs without priori information in limited-view inverse scattering problem**, *Computers & Mathematics with Applications*, **128**, 55–68, 2022.

[A79] Won-Kwang Park, **On the application of orthogonality sampling method for object detection in microwave imaging**, *IEEE Transactions on Antennas and Propagation*, **71** (1), 934–946, 2023.

[A80] Won-Kwang Park, **On the application of MUSIC algorithm for identifying short sound-hard arcs in limited-view inverse acoustic problem**, *Wave Motion*, **117**, Article No. 103114, 2023.

- Dedicated to professor Taehoon Park on the occasion of his retirement.

[A81] Sangwoo Kang, Won-Kwang Park, and Seong-Ho Son, **A qualitative analysis of the bifocusing method for a real-time anomaly detection in microwave imaging**, *Computers & Mathematics with Applications*, **137** (1), 93–101, 2023.

[A82] Won-Kwang Park, **A novel study on the orthogonality sampling method in microwave imaging without background information**, *Applied Mathematics Letters*, **145**, Article No. 108766, 2023.

[A83] Seong-Ho Son and Won-Kwang Park, **Application of the bifocusing method in microwave imaging without background information**, *Journal of the Korean Society for Industrial and Applied Mathematics*, **27** (2), 109–122, 2023.

[A84] Chi Young Ahn, Seongje Chae, Sangwoo Kang, Kwang-Jae Lee, Won-Kwang Park, and Seong-Ho Son, **Orthogonality sampling method for identifying small anomalies in real-world microwave imaging**, *East Asian Journal on Applied Mathematics*, accepted for publication.

[A85] Sangwoo Kang and Won-Kwang Park, **A novel study on the bifocusing method in two-dimensional inverse scattering problem**, Special issue on new insights of the application of inverse problems and machine learning in science and technology, *AIMS Mathematics*, **8** (11), 27080–27112, 2023.

[A86] Won-Kwang Park, **On the identification of small anomaly in microwave imaging without homogeneous background information**, *AIMS Mathematics*, **8** (11), 27210–27226. 2023.

Submitted Articles

[S1] Won-Kwang Park, **Application of MUSIC-type imaging for anomaly detection without background information**.

[S2] Won-Kwang Park, **Real-time identification of small anomalies from scattering matrix without background information**.

[S3] Seongje Chae and Won-Kwang Park, **Application of the orthogonality sampling method in real-world microwave imaging**, conference proceedings.

[S4] Seongje Chae, Taeyoung Ha, Won-Kwang Park, and Minha Yoo, **Application of the topological derivative for a fast imaging of unknown objects from boundary measurements**, conference proceedings.

[S5] Janghoon Jeong, Won-Kwang Park, and Seong-Ho Son, **Object localization in highly cluttered environments using neural network learning on microwave scattering data**.

Papers in Conference Proceedings & Abstracts

[C1] Won-Kwang Park, Habib Ammari, and Dominique Lesselier, **On the imaging of two-dimensional thin inclusions by a MUSIC-type algorithm from boundary measurements**, Electromagnetic Nondestructive Evaluation (ENDE) XII, Studies in Applied Electromagnetics and Mechanics, **32**, 297–304, 2009.

[C2] Won-Kwang Park, Habib Ammari, and Dominique Lesselier, **Non-iterative MUSIC-type algorithm for reconstructing two-dimensional thin dielectric inclusions**, Proceedings of the EU-Korea Conference on Science and Technology (EKC), Springer Proceedings in Physics, **124**, 297–305, 2008.

[C3] Won-Kwang Park, Habib Ammari, and Dominique Lesselier, **Non-iterative imaging of electromagnetic thin inclusions**, Digiteo annual forum, 2008.

[C4] Won-Kwang Park and Dominique Lesselier, **Fissures minces et la faisabilité de leur imagerie électromagnétique non-itérative**, Journée Thématique GDR ONDES GT1–GT3 et Intergroupe ONDES–ISIS, 2008.

[C5] Won-Kwang Park and Hyundae Lee, **Location search algorithm of thin conductivity inclusions**, Proceedings of conférence annuelle de l'Association des Scientifiques Coréens en France (ASCoF), 49–53, 2009.

[C6] Habib Ammari, Hyeonbae Kang, Hyundae Lee, and Won-Kwang Park, **Fast imaging algorithm for impenetrable small cracks**, International workshop on non-conventional imaging and focusing techniques: from acoustics to optics, May 2009, Cargèse, France.

[C7] Won-Kwang Park and Dominique Lesselier, **On the level set evolution of thin electromagnetic screens in the wave propagation regime**, Workshop on electromagnetic inverse problems, 2009.

[C8] Won-Kwang Park and Dominique Lesselier, **Level set method for reconstruction of thin electromagnetic inclusions**, Proceedings of the EU-Korea Conference on Science and Technology (EKC), **135**, 99–108, 2010.

[C9] Won-Kwang Park and Dominique Lesselier, **Imaging of scattering screens via fast methods**, Proceedings of the 2009 International conference on electromagnetics in advanced applications (ICEAA), 74–77, 2009.

[C10] Won-Kwang Park, **Non-iterative imaging of thin dielectric inclusions buried within a half-space: limited aspect problem**, Second SFB Status Seminar, 2009.

[C11] Won-Kwang Park, **Topological derivative concept for imaging of thin inclusions**, Proceedings of The Korean Institute of Electromagnetic Engineering Science (KIEES) Conference, **20** (1), 66, November 2010.

[C12] Won-Kwang Park and Taehoon Park, **Low-frequency limited-view inverse scattering from thin electromagnetic inclusions**, Proceedings of the 4th International Congress on Image and Signal Processing (CISP), 2785–2788, 2011.

[C13] Won-Kwang Park and Dominique Lesselier, **Non-iterative electromagnetic imaging of perfectly conducting screens from limited range far-field data**, Proceedings of International Symposium on Antennas and Propagation (ISAP), 2011.

[C14] Yong-Ki Ma and Won-Kwang Park, **Non-Iterative Imaging of Perfectly Conducting Crack**, Proceedings of the Korean Institute of Electromagnetic Engineering Science (KIEES) Conference, **21** (1), 108, 2011.

[C15] Won-Kwang Park, **An accurate location search of small electromagnetic inhomogeneities buried in a half-space**, Proceedings of the Korean Society for Industrial and Applied Mathematics (KSIAM), **7** (1), 235–238, 2012.

[C16] Joo Young Huh, Young Mi Kwon, Young-Deuk Joh, and Won-Kwang Park, **Multi-frequency imaging of small electromagnetic inclusions via limited-view near-field data**, Proceedings of the 5th International Congress on Image and Signal Processing (CISP), 1889–1892, 2013.

[C17] Young-Deuk Joh, Joo Young Huh, Young Mi Kwon, and Won-Kwang Park, **Structure of single- and multi-frequency imaging functions**, Proceedings of the Korean Institute of Electromagnetic Engineering Science (KIEES) Conference, **22** (1), 3, 2012.

[C18] Won-Kwang Park and Dominique Lesselier, **Multi-frequency imaging of perfectly conducting cracks via boundary measurements**, Proceedings of the International Conference on Mathematical Modeling in Physical Sciences (IC-MSQUARE), Journal of Physics: Conference Series, **410**, 012018, 2013.

[C19] Young-Deuk Joh, Young Mi Kwon, Joo Young Huh, and Won-Kwang Park, **Weighted multi-frequency imaging of thin, crack-like electromagnetic inhomogeneities**, Proceedings of the Progress in Electromagnetics Research Symposium (PIERS) in Taipei, 631–635, 2013.

[C20] Won-Kwang Park, **Shape reconstruction of thin electromagnetic inhomogeneities via multi-frequency topological derivative**, Proceedings of the Korean Society for Industrial and Applied Mathematics (KSIAM), **8** (1), 147–150, 2013.

[C21] Won-Kwang Park and Young-Deuk Joh, **A relationship between MUSIC-type imaging functional and Bessel functions**, Proceedings of the Korean Society for Industrial and Applied Mathematics (KSIAM), **8** (1), 213–216, 2013.

[C22] Young Mi Kwon and Won-Kwang Park, **Subspace migration imaging of small perfectly conducting cracks in the limited-view inverse scattering**, Proceedings of the Korean Society for Industrial and Applied Mathematics (KSIAM), **8** (1), 225–228, 2013.

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Performed & Contributed Presentations

[P1] **On the imaging of two-dimensional dielectric thin inclusions by a MUSIC-type algorithm from measured scattered field data**, Conférence annuelle de l'ASCoF, May 2008, Bordeaux, France (Received Best Paper Award).

[P2] **On the imaging of two-dimensional thin inclusions by a MUSIC-type algorithm from boundary measurements**, 13th International Workshop on Electromagnetic Nondestructive Evaluation (ENDE 2008), June 2008, Seoul, Korea.

[P3] **Non-iterative MUSIC type algorithm for reconstructing two dimensional thin dielectric inclusions**, EU-Korea Conference on Science and Technology, August 2008, Heidelberg, Germany.

[P4] **Non-iterative imaging of electromagnetic thin inclusions**, DIGITEO Forum, October 2008, Gif-sur-Yvette, France.

[P5] **Fissures minces et la faisabilité de leur imagerie électromagnétique non-itérative**, Journée Thématique GDR ONDES GT1–GT3 et Intergroupe ONDES–ISIS, December 2008, Paris, France.

[P6] **MUSIC-type imaging of small perfectly conducting cracks**, Mini workshop sur les méthodes d'imagerie, Laboratoire Ondes et Acoustique, ESPCI, April 2009, Paris, France.

[P7] **Asymptotic imaging of perfectly conducting cracks**, Institut Fresnel, April 2009, Marseille, France.

- Invited by Anne Sentenac.

[P8] **Non-iterative imaging of perfectly conducting cracks**, Karl Franzens University of Graz, April 2009, Graz, Austria.

- Invited by Karl Kunisch.

[P9] **Location search algorithm of thin conductivity inclusions**, Conférence Annuelle de l'ASCoF, May 2009, Lyon, France (Received Best Paper Award).

[P10] **On the level-set evolution of thin electromagnetic screens in the wave propagation regime** (contributed presentation), Workshop on Electromagnetic Inverse Problems, June 2009, The University of Manchester, UK.

[P11] **Level-set method for reconstruction of thin electromagnetic inclusions**, EU-Korea Conference on Science and Technology, August 2009, Reading, Wokefield Park, UK (Received Best Paper Award).

[P12] **Imaging of scattering screens via fast methods** (contributed presentation), International Conference on Electromagnetics in Advanced Applications (ICEAA 2009), September 2009, Torino, Italy.

[P13] **Non-iterative imaging of thin dielectric inclusions buried within a half-space: limited aspect problem**, Second SFB Status Seminar, November 2009, Schloss Röthelstein, Graz, Austria.

[P14] **Sur une imagerie électromagnétique rapide d'écrans minces en demi-espace affecté d'inclusions aléatoires** (contributed presentation), GDR ONDES-GT7, Manipulation spatiale et temporelle des ondes pour l'imagerie, Institut Fresnel, May 2010, Marseille, France.

[P15] **On the imaging of two-dimensional thin inclusions and perfectly conducting cracks: development of non-iterative imaging algorithm**, New faculty workshop, Kookmin University, October 2010, Seoul, Korea.

[P16] **Imaging schemes for perfectly conducting cracks**, 2010 Global KMS International Conference, Pohang University of Science and Technology (POSTECH), October 2010, Pohang, Korea.

[P17] **Topological derivative concept for imaging of thin inclusions**, KIEES Conference, Dankook University, November 2010, Cheonan, Korea.

[P18] **Non-iterative electromagnetic imaging of perfectly conducting screens from limited range far-field data**, International Symposium on Antennas and Propagation (ISAP), Lotte Hotel Jeju, October 2011, Jeju, Korea.

[P19] **Non-iterative imaging of perfectly conducting crack: analysis of topological derivative imaging function**, 2011 KIEES Conference, Korea International Exhibition Center (KINTEX), November 2011, Goyang, Korea.

[P20] **An accurate location search of small electromagnetic inhomogeneities buried in a half-space**, KSIAM 2012 Spring Conference, Ewha Womans University, May 2012, Seoul, Korea.

[P21] **Multi-frequency topological derivative for imaging of perfectly conducting cracks**, 29th Medical Imaging Seminar, Department of Computational Science and Engineering, Yonsei University, June 2012, Seoul, Korea.

- Invited by Jin Keun Seo.

[P22] **Fast imaging of thin, curve-like electromagnetic inclusions via topological derivative concept**, 2012 KMS fall meeting, Daejeon Convention Center, October 2012, Daejeon, Korea.

[P23] **Structure of single- and multi-frequency imaging functions**, KIEES Conference, COEX, November 2012, Seoul, Korea.

[P24] **Shape reconstruction of thin electromagnetic inhomogeneities via multi-frequency topological derivative**, KSIAM 2013 Spring Conference, Yonsei University, May 2013, Seoul, Korea.

[P25] **A relationship between MUSIC-type imaging functional and Bessel functions** (contributed poster presentation), KSIAM 2013 Spring Conference, Yonsei University, May 2013, Seoul, Korea (Received Best Poster Award).

[P26] **Subspace migration imaging of small perfectly conducting cracks in the limited-view inverse scattering** (contributed poster presentation), KSIAM 2013 Spring Conference, Yonsei University, May 2013, Seoul, Korea.

[P27] **MUSIC-type imaging in the limited-view inverse scattering**, KIEES summer conference, Ramada Plaza Jeju, Jeju, August 2013, Korea.

[P28] **Asymptotic properties of MUSIC-type imaging in two-dimensional inverse scattering from thin inclusions or cracks: Structure of MUSIC algorithm**, National Institute for Mathematical Sciences, Daejeon, October 2013, Korea.

- Invited by Chi Young Ahn.

[P29] **Fast imaging of perfectly conducting, arc-like cracks via multi-frequency topological derivative**, Annual Meeting of KSIAM, Seogwipo KAL Hotel, November 2013, Jeju, Korea.

[P30] **Structure of MUSIC algorithm for imaging of small perfectly conducting cracks in limited-view inverse scattering problem** (contributed poster presentation), Annual Meeting of KSIAM, Seogwipo KAL Hotel, November 2013, Jeju, Korea (Received Best Poster Award).

[P31] **Introduction to MUSIC algorithm**, National Institute for Mathematical Sciences, Daejeon, October 2013, Korea.

- Invited by Chi Young Ahn.

[P32] **Asymptotic properties of MUSIC-type imaging in two-dimensional inverse scattering from thin electromagnetic inclusions: structure of MUSIC-type imaging in full- and limited-view problems**, Laboratoire des Signaux et Systèmes, École Supérieure d'Électricité, January 2014, France.

- Invited by Dominique Lesselier.

[P33] **Multi-frequency subspace migration for imaging of perfectly conducting, arc-like cracks in full- and limited-view inverse scattering problems**, Laboratoire des Signaux et Systèmes, École Supérieure d'Électricité, January 2014, Gif-sur-Yvette, France.

- Invited by Dominique Lesselier.

[P34] **Asymptotic properties of MUSIC-type imaging in two-dimensional inverse scattering from thin electromagnetic inclusions**, School of Computational Sciences, Korea Institute for Advanced Study (KIAS), February 2014, Seoul, Korea.

- Invited by Hyenkyun Woo.

[P35] **MUSIC algorithm for imaging of perfectly conducting cracks in limited-view inverse scattering problems**, Department of Mathematical Sciences, Korea Advanced Institute of Science and Technology (KAIST), May 2014, Daejeon, Korea.

[P36] **Analysis of weighted multi-frequency subspace migration for a fast imaging of thin electromagnetic inhomogeneities**, KSIAM 2014 Spring Conference, Seoul National University, May 2014, Seoul, Korea.

[P37] **Asymptotic structure of two-dimensional MUSIC-type imaging functional**, Annual meeting of the KSIAM, International Convention Center Jeju, November 2014, Jeju, Korea.

[P38] **A study on the topological derivative-based imaging of thin electromagnetic inhomogeneities in limited-aperture problems**, KAIST–CMC, PDE/Inverse Problem Workshop, KAIST, December 2014, Daejeon, Korea.

[P39] **MUSIC-type imaging algorithm with inaccurate frequency**, KSIAM 2015 Spring Conference, Sungkyunkwan University, May 2015, Suwon, Korea.

[P40] **Detection of small cracks via subspace migration with unknown frequency** (contributed poster presentation), KSIAM 2015 Spring Conference, Sungkyunkwan University, May 2015, Suwon, Korea.

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[P42] **A necessary condition for application of topological derivative in limited-aperture inverse scattering problem**, Progress In Electromagnetics Research Symposium, Top Hotel Praha, August 2015, Prague, Czech Republic.

[P43] **Subspace migration for imaging of thin electromagnetic inhomogeneities without shape information**, Progress In Electromagnetics Research Symposium, Top Hotel Praha, August 2015, Prague, Czech Republic.

[P44] **Subspace migration weighted by natural logarithmic function**, The Korean Institute of Electromagnetic Engineering Science summer conference, Ramada Plaza Jeju, August 2015, Jeju, Korea.

[P45] **Inverse Scattering Problem: Recent development of MUSIC-type imaging technique**, Kongju National University, November 2015, Kongju, Korea.

- Invited by Yong-Ki Ma.

[P46] **Subspace migration without a priori information of thin inhomogeneity**, Annual meeting of the KSIAM, Novotel Ambassador, November 2015, Busan, Korea.

[P47] **MUSIC algorithm for imaging of inhomogeneities surrounded by random scatterers: numerical study**, The 2nd International Conference on Applied Electromagnetic, Deevana Plaza Krabi Aonang, December 2015, Krabi, Thailand.

[P48] **Introduction to MUSIC algorithm and its application in inverse scattering problem**, Medical Imaging Computing Seminar in Yonsei University, April 2016, Seoul, Korea.

- Invited by Jin Keun Seo.

[P49] **Singular Value Decomposition and its application in inverse scattering problem**, Seminars in Special Topics, Kookmin University, May 2016, Seoul, Korea.

- Invited by Chang Bum Kim.

[P50] **On the imaging of an open sound-hard arc in inverse acoustic scattering problem**, KSIAM 2016 Spring Conference, National Institute for Mathematical Sciences, May 2016, Daejeon, Korea.

[P51] **Influence of distribution of incident and observation directions in subspace migration** (contributed poster presentation), KSIAM 2016 Spring Conference, National Institute for Mathematical Sciences, May 2016, Daejeon, Korea.

[P52] **MUSIC algorithm for imaging perfectly conducting crack in limited-view inverse scattering problem**, the 8th International Conference on Inverse Problems and Related Topics, Ewha Woman University, June 2016, Seoul, Korea.

[P53] **On the imaging of arc-like perfectly conducting crack** (contributed poster presentation), KIEES summer conference, Maison Glad Jeju, June 2016, Jeju, Korea (Received Best Poster Award).

[P54] **Shape identification of arc-like perfectly conducting cracks in limited-view inverse scattering problem**, The 12th World Congress on Computational Mechanics, COEX, July 2016, Seoul, Korea.

[P55] **Application of MUSIC for a fast imaging of inhomogeneities surrounded by random scatterers**, Electronics and Telecommunications Research Institute (ETRI), July 2016, Daejeon, Korea.

- Invited by Seong-Ho Son.

[P56] **Application of MUSIC for shape identification of dielectric extended targets in inhomogeneous medium**, Progress in Electromagnetics Research Symposium, Shanghai International Convention Center, August 2016, Shanghai, China.

[P57] **Detection of small dielectric inhomogeneities enclosed by random scatterers via Kirchhoff and subspace migration**, Progress in Electromagnetics Research Symposium, Shanghai International Convention Center, August 2016, Shanghai, China.

[P58] **Multi-frequency MUSIC for searching small dielectric inclusions surrounded by random scatterers**, Progress in Electromagnetics Research Symposium, Shanghai International Convention Center, August 2016, Shanghai, China.

[P59] **Shape identification of perfectly conducting, arc-like crack in Transverse Electric mode**, URSI Asia-Pacific Radio Science Conference, Grand Hilton Seoul Hotel, August 2016, Seoul, Korea.

[P60] **Application of MUSIC for anomaly detection in microwave imaging**, International Conference for the 70th Anniversary of KMS, Seoul National University, October 2016, Seoul, Korea.

[P61] **MUSIC algorithm for anomaly detection in inverse scattering problem**, Department of Mathematical Sciences, Korea Advanced Institute of Science and Technology (KAIST), November 2016, Daejeon, Korea.

- Invited by Mikyoung Lim.

[P62] **MUSIC algorithm for imaging anomaly in microwave imaging**, Annual meeting of the KSIAM, Seogwipo KAL Hotel, November 2016, Jeju, Korea.

[P63] **MUSIC algorithm for small anomaly detection in microwave imaging**, The 2nd Winter School in Imaging Science, Sonofelice, Daemyung Resort, January 2017, Gangwon Province, Korea.

[P64] **Linear sampling method for imaging small or crack-like defects: investigation of a relationship with Bessel functions**, Laboratoire Génie électrique et électronique de Paris (GeePs), CentraleSupélec, Université Paris-Sud, February 2017, Gif-sur-Yvette Cedex, France.

- Invited by Marc Lambert.

[P65] **Ground penetrating radar–microwave tomography**, 1st CSE-NIMS Workshop, Department of Computational Science and Engineering, Yonsei University, March 2017, Seoul, Korea.

[P66] **A novel study on direct sampling method for retrieving multiple targets**, Department of Mathematics, Inha University, April 2017, Incheon Metropolitan City, Korea.

- Invited by Hyundae Lee.

[P67] **Multi-frequency topological derivative strategy for imaging two dimensional perfectly conducting, arc-like crack**, the 9th Applied Inverse Problems conference, Zhejiang University, June 2017, Hangzhou, China.

[P68] **A study on direct sampling method for retrieving multiple targets**, Europe-Korea Conference on Science and Technology (EKC), Kistamässan, July 2017, Stockholm, Sweden.

[P69] **A novel study on direct sampling method for imaging multiple targets**, the 2nd International Conference on Applied Mathematics, Simulation and Modelling (AMSM), New Dara Boutique Hotel & Residence, August 2017, Phuket, Thailand.

[P70] **Imaging of small anomaly via direct sampling method**, KIEES summer conference, Ramada Plaza Jeju, August 2017, Jeju, Korea.

[P71] **Analysis of direct sampling method corresponding to the length of crack** (contributed poster presentation), KIEES summer conference, Ramada Plaza Jeju, August 2017, Jeju, Korea.

[P72] **Fast location search of small anomaly by using microwave**, the 18th International Symposium on Applied Electromagnetics and Mechanics (ISEM), Le Majestic - Centre des Congrès, Chamonix Mont-Blanc, September 2017, Haute-Savoie, France.

[P73] **Linear sampling method for localizing small anomaly in microwave imaging**, the 22nd International Workshop on Electromagnetic Nondestructive Evaluation (ENDE), CEA LIST, September 2017, Gif-sur-Yvette, France.

[P74] **Fast localization of small inhomogeneity without diagonal elements of MSR matrix**, International Symposium on Antennas and Propagation (ISAP), The Phuket Graceland Resort & Spa, November 2017, Phuket, Thailand.

[P75] **Real-time detection of moving anomaly in microwave tomography: analysis and real-data experiment**, A3 Workshop on Applied Inverse Problems and Related Topics, Graduate School of Mathematical Sciences, University of Tokyo, November 2017, Tokyo, Japan.

[P76] **Deep learning for anomaly detection in microwave tomography**, Department of Computational Science and Engineering, Yonsei University, December 2017, Seoul, Korea.

- Invited by Jin Keun Seo.

[P77] **Real-time anomaly detection in microwave tomography**, The 3rd Winter School in Imaging Science, Sonofelice Vivaldi Park, January 2018, Gangwon Province, Korea.

[P78] **Application of direct sampling method in microwave tomography: analysis, feasibilities and limitations**, Inverse Problems and Medical Imaging 2018, Graduate School of Mathematical Sciences, University of Tokyo, February 2018, Tokyo, Japan.

[P79] **Recent progress on direct sampling method in microwave imaging**, National Institute for Mathematical Sciences, April 2018, Daejeon, Korea.

- Invited by Taeyoung Ha.

[P80] **Application of direct sampling method in microwave imaging**, Ulsan National Institute of Science and Technology (UNIST), May 2018, Ulsan, Korea.

- Invited by Yunho Kim.

[P81] **MUSIC algorithm for imaging small anomaly from scattering parameter: real-data experiments**, Progress In Electromagnetics Research Symposium, Toyama International Conference Center, August 2018, Toyama, Japan.

[P82] **Real-time microwave imaging of small anomalies without diagonal elements of the scattering matrix**, International Conference on Inverse Problems and Related Topics, Department of Electrical & Computer Engineering, National University of Singapore, August 2018, Singapore.

[P83] **Real-time microwave imaging of moving anomaly from scattering matrix**, Technology & Innovation Centre, EU-Korea Conference on Science and Technology, University of Strathclyde, August 2018, Glasgow, Scotland.

[P84] **Real-time microwave imaging of moving anomalies from scattering matrix**, IEEE AP-S Fukuoka Chapter special lecture, Kyushu Sangyo University, September 2018, Fukuoka, Japan.

- Invited by Kenichi Ishida.

[P85] **MUSIC algorithm for imaging small anomaly from scattering matrix**, 71st Joint Conference of Electrical, Electronics and Information Engineers in Kyushu, Oita University, September 2018, Oita Prefecture, Japan.

- Invited by Kenichi Ishida.

[P86] **Application of MUSIC algorithm in microwave imaging**, Joint Meeting of the Korean Mathematical Society (KMS) and the German Mathematical Society (DMV), COEX, October 2018, Seoul, Korea.

[P87] **Real-time tracking of moving anomaly from scattering parameters**, the 9th International Symposium on Antennas and Propagation (ISAP), Paradise Hotel Busan, October 2018, Busan, Korea.

[P88] **Multi-frequency direct sampling method for imaging short linear perfectly conducting cracks**, Annual Meeting of the KSIAM, Ramada Plaza Jeju, November 2018, Jeju, Korea.

[P89] **Direct sampling method in inverse scattering problem: from theory to real-world application**, Department of Mathematical Sciences, Korea Advanced Institute of Science and Technology (KAIST), November 2018, Daejeon, Korea.

- Invited by Mikyoung Lim.

[P90] **MUSIC algorithm without diagonal elements of scattering matrix**, 8th international conference on advances in computing, electronics and communication, G Towel Hotel, January 2019, Kuala Lumpur, Malaysia.

[P91] **Direct sampling method in limited-view inverse scattering problem**, National Institute for Mathematical Sciences, January 2019, Daejeon, Korea.

- Invited by Taeyoung Ha.

[P92] **Introduction to factorization method for a non-iterative imaging in inverse scattering problem**, National Institute for Mathematical Sciences, January 2019, Daejeon, Korea.

- Invited by Taeyoung Ha.

[P93] **Application of direct sampling method in microwave imaging**, KIEES Winter Conference, High1 Resort, February 2019, Gangwon Province, Korea.

[P94] **Effects on the diagonal elements of scattering matrix in microwave imaging**, A3 Workshop on challenging issue & future direction in medical imaging and inverse problems, Seo Medical Imaging Lab, April 2019, Mokpo, Korea.

[P95] **A study on the effect of diagonal elements of scattering matrix in microwave imaging**, PhotonIcs & Electromagnetics Research Symposium (PIERS) in Rome, Faculty of Engineering, University of Rome "La Sapienza", June 2019, Rome, Italy.

[P96] **MUSIC algorithm for localizing small anomalies from the scattering matrix at a microwave frequency**, 10th Applied Inverse Problems Conference, Université Grenoble-Alpes, July 2019, Grenoble, France.

[P97] **Imaging of unknown anomaly via scattering matrix with and without diagonal elements**, KIEES summer conference, International Convention Center Jeju, August 2019, Jeju, Korea.

[P98] **Imaging of unknown anomaly via scattering matrix with and without diagonal elements**, the 10th International Symposium on Antennas and Propagation (ISAP), Xi'an Paradise Resort, October 2019, Xi'an, China.

[P99] **Non-iterative microwave imaging without background information**, Annual meeting of the KSIAM, Yeosu Venezia Hotel & Resort, November 2019, Yeosu, Korea.

[P100] **A real-time microwave imaging via scattering matrix**, Department of Information and Telecommunication Engineering, Incheon National University, November 2019, Incheon Metropolitan City, Korea.

- Invited by Sungtek Kahng.

[P101] **Real-time imaging of moving anomaly from scattering matrix**, PhotonIcs & Electromagnetics Research Symposium (PIERS) in Xiamen, Swiss Grand Xiamen, December 2019, Xiamen, China.

[P102] **A study on orthogonality sampling method: application to the limited-aperture inverse scattering problem and microwave imaging**, National Institute for Mathematical Sciences, February 2020, Daejeon, Korea.

- Invited by Chi Young Ahn.

[P103] **Application of MUSIC algorithm in real-world microwave imaging**, KIEES summer conference, Ramada Plaza Jeju, August 2020, Jeju, Korea.

[P104] **Application of orthogonality sampling method for identifying small anomaly from scattering parameters**, Annual meeting of the KSIAM, Seogwipo KAL Hotel, November 2020, Jeju, Korea.

[P105] **Localization of small anomalies via othogonality sampling method from scattering pararmeters** (contributed poster presentation), KIEES Winter Conference, Yeosu EXPO Convention Center, February 2021, Yeosu, Korea.

[P106] **Application of MUSIC algorithm in real-world microwave imaging**, Department of Mathematical Sciences, Korea Advanced Institute of Science and Technology (KAIST), July 2021, Daejeon, Korea.

- Invited by Mikyoung Lim.

[P107] **Orthogonality sampling method for localizing unknown anomalies in microwave imaging**, (contributed poster presentation), KIEES Summer Conference, Ramada Plaza Jeju, August 2021, Jeju, Korea.

[P108] **Application of the orthogonality sampling method in real-world microwave imaging** (virtual presentation), 34th General Assembly and Scientific Symposium (GASS) of the International Union of Radio Science (URSI), Faculty of Engineering, University of Rome "La Sapienza", September 2021, Rome, Italy.

[P109] **Effect of the observation direction configuration in orthogonality sampling method**, Annual meeting of the KSIAM, Busan Exhibition & Convention Center (BEXCO), December 2021, Busan, Korea.

[P110] **Design of an orthogonality sampling method in microwave imaging for a fast identification of small anomaly**, the 14th International Conference on Future Information & Communication Engineering, Ramada Jeju City Hotel, January 2022, Jeju, Korea (Received Best Paper Award).

[P111] **MUSIC algorithm for a real-time detection of small anomaly from limited-aperture measurement data** (contributed poster presentation), KIEES Winter Conference, Pheonix Park, February 2022, Pyeongchang, Korea.

[P112] **Effect of the observation directions configuration in the orthogonality sampling method** (contributed poster presentation), KIEES Winter Conference, Pheonix Park, February 2022, Pyeongchang, Korea.

[P113] **Orthogonality sampling method for identifying small anomalies in microwave imaging** (virtual presentation), the 16th European Conference on Antennas and Propagation (EuCAP), Convened Session: Unconventional techniques and applications for inverse scattering problems, IFEMA Palacio Municipal, April 2022, Madrid, Spain.

[P114] **A real-time identification of small conductivity inhomogeneity via topological derivative** (virtual presentation), the 10th International Conference "Inverse Problems: Modeling and Simulation", Minisymposium M24: Inverse Problems via Topological Derivatives, Paradise-Bay Hotel, May 2022, Malta.

[P115] **Real-time tracking of moving objects in real-world microwave imaging**, KSIAM 2022 Spring Conference, Special Session: Inverse Problems, IBS Science Culture Center, May 2022, Daejeon, Korea.

[P116] **Application of the orthogonality sampling method in microwave imaging without background information** (contributed poster presentation), EU-Korea Conference on Science and Technology, Palais du Pharo, July 2022, Marseille, France (Received Best Paper Award).

[P117] **Application and analysis of the orthogonality sampling method for anomaly detection with inaccurate wavenumber** (contributed poster presentation), KIEES summer conference, Ramada Plaza Jeju, August 2022, Jeju, Korea (Received Best Poster Award).

[P118] **Fast anomaly detection via the orthogonality sampling method in microwave imaging** (contributed poster presentation), IEEE International Symposium on Radio-Frequency Integration Technology (RFIT), Hanwha Resort Haeundae, August 2022, Busan, Korea.

[P119] **Detection of small anomaly using MUSIC algorithm without switching device**, The 15th International Conference on Future Information & Communication Engineering (ICFICE), Nha Trang Horizon Hotel, January 2023, Nha Trang, Vietnam.

[P120] **A novel study on orthogonality sampling method** (contributed poster presentation), KIEES Winter Conference, Havichi Hotel & Resort, February 2023, Jeju, Korea.

[P121] **Application and analysis of the music algorithm in real-world microwave imaging**, Department of Mathematics, Pusan National University, February 2023, Busan, Korea.

- Invited by Ji-Hun Yoon.

[P122] **Fast imaging of single, small conductivity inhomogeneity via topological derivative concept**, KSIAM 2023 Spring Conference, Special Session: Inverse Problems, Alpensia Resort, May 2023, Pyeongchang, Korea.

[P123] **On the application of MUSIC algorithm for identifying small anomaly without background information**, The 24th International Conference on the Computation of Electromagnetic Fields (COMPUMAG), Kyoto International Conference Center (ICC Kyoto), May 2023, Kyoto, Japan.

[P124] **Detection of small anomaly using MUSIC algorithm without switching device in microwave imaging**, National Institute for Mathematical Sciences, Daejeon, June 2023, Korea.

- Invited by Chi Young Ahn.

[P125] **On the identification of small anomaly without background information**, Proceedings of the 26th International Workshop on Electromagnetic Nondestructive Evaluation (ENDE), Thessaloniki Concert Hall, June 2023, Thessaloniki, Greece.

[P126] **Application of MUSIC algorithm for identifying unknown objects from limited-aperture configuration**, Special Session on Inverse Problems in Antenna and Scattering: Theory, Challenges and Applications, PhotonIcs & Electromagnetics Research Symposium (PIERS) in Prague, Prague Congress Center, July 2023, Prague, Czech Republic.

[P127] **Application of MUSIC algorithm in microwave imaging without switching device**, The 10th International Congress on Industrial and Applied Mathematics (ICIAM), Waseda University, August 2023, Tokyo, Japan.

[P128] **On the identification of small anomaly via MUSIC algorithm without background information**, The 11th Applied Inverse Problems Conference in Göttingen, University of Göttingen, September 2023, Göttingen, Germany.

[P129] **Topological derivative strategy for a fast imaging of thin, curve-like electromagnetic inhomogeneities**, National Institute for Mathematical Sciences, Daejeon, September 2023, Korea.

- Invited by Chi Young Ahn.

Miscellaneous

- arXiv, Google Scholar, Mathematics Genealogy Project, MathSciNet, ORCID, Research Gate, YouTube.

Last modified on October 25, 2023