

SHOUHEI KIDERA

Associate Professor
Graduate School of Informatics and Engineering
The University of Electro-Communications
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Curriculum Vitae

Education

Sep. 2007	Ph.D in Informatics <i>Graduate School of Informatics, Kyoto University, Kyoto, Japan</i> “High Performance 3-D Imaging Algorithm for UWB Pulse Radars” Main Advisor : Prof. Toru Sato (Kyoto University), Advisors : Prof. Takashi Matsuyama (Kyoto University) and Prof. Tetsuya Matsuda (Kyoto University)
Mar. 2005	Master degree in Informatics <i>Graduate School of Informatics, Kyoto University, Kyoto, Japan</i> “Development of High-Resolution Imaging Algorithm Based on Waveform Estimation for UWB Pulse Radar Systems” Main Advisor : Prof. Toru Sato (Kyoto University)
Mar. 2003	Bachelor degree in Electric and Electronic Engineering. <i>Faculty of Electric and Electronic Engineering, Kyoto University</i> “Development of Accurate Imaging Algorithm for UWB Pulse Radar System” Main Advisor : Prof. Toru Sato (Kyoto University)

Professional Experience

Oct. 2017 – present.	JST PRESTO Researcher (Additional post), Japan Science and Technology Agency
Apr. 2016 – Sep. 2016.	Visiting Researcher, University of Wisconsin Madison (with Lab by Prof. Susan.C. Hagness)
Sep. 2014 – present.	Associate Professor, Graduate School of Informatics and Engineering, The University of Electro-Communications
Apr. 2010 – Aug. 2014.	Assistant Professor, Graduate School of Informatics and Engineering, The University of Electro-Communications
Apr. 2009 – Mar. 2010.	Assistant Professor, Graduate School of Electro-Communications, The University of Electro-Communications
Oct. 2007 – Mar. 2009.	JSPS Postdoctoral Fellow, Graduate School of Informatics, Kyoto University
Apr. 2007 – Sep. 2007.	JSPS Doctoral Fellow, Graduate School of Informatics, Kyoto University
Apr. 2005 – Mar. 2007.	Research Associate, Graduate School of Informatics, Kyoto University The 21st Century COE (Center Of Excellence) Program

Current Research Interests

- Microwave imaging
- Advanced radar signal or image processing
- Electromagnetic inverse scattering analysis
- Ultra-wideband short range Radar and remote sensing
- Super-resolution 3-D imaging theory and algorithm
- Shadow region imaging using multiple scattering waves
- Super-resolution Doppler velocity estimation

- Target recognition with machine learning approach
- Polarimetric and interferometric radar
- Moving target tracking and imaging, and automobile radar application
- Synthetic aperture radar (SAR) and remote sensing issue
- Bio-medical microwave imaging for breast tumor detection
- Microwave non-destructive testing application
- Terahertz imaging with radar signal processing approach

Professional Awards & Honors

- Sep. 2016 **Distinguished Service Award**, Awardee : S. Kidera
Institute of Electronics, Information and Communication Engineers Communications Society
- Apr. 2014 **Funai Achievement Award**, Awardee : S. Kidera
The Funai Foundation for Information Technology
For contribution of development of an super-resolution and shadow region imaging method for UWB sensor
- Apr. 2013 **Young Scientist's Prize**, Awardee : S. Kidera
The Japanese Minister of Education, Culture, Sports, Science and Technology (MEXT).
For contribution of development of an innovative imaging method for UWB sensor
- Mar. 2013 **TELECOM System Technology Award**, Awardee : S. Kidera and T. Kirimoto
The Telecommunications Advancement Foundation
With the paper: S. Kidera and T. Kirimoto,
"Fast and Shadow Region 3-dimensional Imaging Algorithm with Range Derivative of Doubly Scattered Signals for UWB Radars",
IEEE Trans. on Antennas and Propagation, vol.60, No. 2, pp. 984–996, Feb, 2012.
- Mar. 2013 **IEEE AESS Japan Chapter 2012 Best Paper Award**, Awardee : S. Kidera
IEEE AESS Japan Chapter
With the paper: S. Kidera, H. Yamada and T. Kirimoto,
"Accurate 3-dimensional Imaging Method Based on Extended RPM for Rotating Target Model", *IEICE Trans. Commun.* vol.E95-B, no. 10, pp. 3279-3289, Oct., 2012.
- Jul. 2012 **Ando Incentive Prize for the Study of Electronics**, Awardee : S. Kidera
The Foundation of Ando Laboratory,
For contribution of development of super-resolution and shadow region imaging method for UWB radar.
- Oct. 2011 **Young Scientist Award in ISAP 2011**,
Awardee : S. Kidera and T. Kirimoto
The 2011 International Symposium on Antennas and Propagation (ISAP2011)
With the paper: S. Kidera and T. Kirimoto,
"Accurate Shadow Region Imaging Algorithm Based on Doubly Scattered Range Points Migration for UWB Radars"
- Aug. 2011 **Young Scientist Award in URSI GASS 2011**, Awardee : S. Kidera
The XXXth General Assembly and Scientific Symposium of the International Union of Radio Science (URSI) 2011
With the paper: S. Kidera and T. Kirimoto,
"Accurate 3-dimensional Image Expansion Algorithm Using Range Derivative of Double Scattered Signals for UWB Radars",
- Aug. 2010 **Young Scientist Award in URSI EMTS 2010**, Awardee : S. Kidera
URSI Commission B, 20th International Symposium on Electromagnetic Theory (EMTS) 2010
With the paper: S. Kidera, T. Sakamoto and T. Sato,
"Experimental Study on Super-Resolution 3-D Imaging Algorithm Based on Extended Capon with Reference Signal Optimization for UWB Radars"
- Mar. 2010 **IEICE Young Researcher's Award**, Awardee : S. Kidera
The Institute of Electronics, Information and Communication Engineers (IEICE)
For the papers presented in the general and the society conference in IEICE 2009.
- Aug. 2008 **IEEJ Excellent Presentation Award**, Awardee : S. Kidera
The Institute of Electrical Engineers Japan (IEEJ)
With the paper: S. Kidera, T. Sakamoto, T. Sato,
"An Experimental Study for High-Speed and Accurate 3-D Imaging Algorithm with Spectrum Shift Correction for UWB Pulse Radars," IEEJ 36th Electromagnetic Theory Symposium, EMT-07-116, Oct. 2007 (in Japanese).
- Sep. 2007 **Best Student Paper Award**, Awardee : S. Kidera, T. Sakamoto and T. Sato
2007 IEEE International Conference on Ultra Wide-Band 2007,
With the paper: S. Kidera, T. Sakamoto, T. Sato,
"An Experimental Study for High-Resolution 3-D Imaging Algorithm with Linear Array for UWB Radars".
2007 IEEE International Conference on Ultra-WideBand (ICUWB2007), Marina Mandarin Hotel, Singapore, Sep. 2007
- Sep. 2007 **IEICE Communication Society Best Paper Award**, Awardee : T. Sakamoto, S. Kidera, T. Sato and S. Sugino
Communications Society, IEICE
With the paper T. Sakamoto, S. Kidera, T. Sato, S. Sugino,
"An Experimental Study on a Fast 3-D Imaging Algorithm for UWB Pulse Radars", Vol. J90-B, No. 1, pp.63-73, Jan 2007 (in Japanese).

Professional Activities

- Member, *IEEE (The Institute of Electrical and Electronics, Engineers)*
- Member, *IEICE (The Institute of Electronics, Information and Communication Engineers)*
- Member, *IEEJ (The Institute of Electrical Engineers Japan)*
- Member, *JSAP (The Japan Society of Applied Physics)*
- Associate Editor for *IEICE Transaction on Communications*, 2017 - 2021.
- Associate Editor for *IEICE Transaction on Electronics, Special Section on Recent Progress in Electromagnetic Theory and Its Application*, 2011 - 2014.
- Secretary of Technical Committee for *IEICE SANE (Space Aeronautical and Navigational Electronics)*, 2013 - 2016.
- Secretary of Steering Committee for *APSAR (Asia-Pacific Conference on Synthetic Aperture Radar) 2013*, 2011 - 2013.
- Chair of Special Session Committee for *IEEE International Conference on Antenna Measurements & Applications (CAMA2017)*, 2018, 2015 - 2019.
- Chair of Sponsorship Committee for *IEEE IGARSS (International Geoscience and Remote Sensing Symposium) 2019*, 2015 - 2019.
- Session Convener "B06: Inverse Scattering and Imaging", for 2019 URSI Asia-Pacific Radio Science Conference (AP-RASC 2019), 2018 - 2019.
- Expert Member of Technical Committee for *IEICE EMT (Electromagnetic Theory)*, 2009 - Present.
- Reviewer for *Radio Science*,
- Reviewer for *IEEE Trans. Geoscience and Remote Sensing*,
- Reviewer for *IEEE Geoscience and Remote Sensing Letters*,
- Reviewer for *IEEE Trans. Antennas and Propagation*,
- Reviewer for *IEEE Trans. Microwave Theory and Technology*,
- Reviewer for *IEEE Trans. Access*,
- Reviewer for *IET Radar, Sonar & Navigation*.,,
- Reviewer for *IEICE Trans. Communications*,
- Reviewer for *IEICE Trans. Electronics*,
- Reviewer for *IEICE Trans. Fundamentals*,
- Reviewer for *IEICE Trans. Information & Systems*,

Refereed Journal Articles ¹

1. H. Morimoto, and **Shouhei Kidera** "'Super-Resolution Multi-layer Structure Analysis via Depth Adaptive Compressed Sensing for Terahertz Subsurface Imaging", , *IEEE Geoscience and Remote Sensing Letters*, 2021.
2. H. Sato, and **Shouhei Kidera** "Noise-robust Microwave Breast Imaging Applied to Multi-frequency Contrast Source Inversion", *IEEE Journal of Electromagnetics, RF, and Microwaves in Medicine and Biology*, 2021.
3. H. Sato, and **Shouhei Kidera** "ROI Limited Unknowns Reduction based Contrast Source Inversion for Microwave Breast Imaging", *IEEE Antennas and Wireless Propagation Letters*, 2021 (in press).
4. Y. Akiyama, T. Omori, and **Shouhei Kidera** "k-Space Decomposition Based Three-dimensional Imaging with Range Points Migration for Millimeter Wave Radar", *IEEE Trans. Geoscience & Remote Sensing*, 2020 (in press). doi: 10.1109/TGRS.2020.3029301.
5. Y. Takaishi, T. Omori, and **Shouhei Kidera** "Noise-Robust Distorted Born Iterative Method with Prior Estimate for Microwave Ablation Monitoring", *IEICE Trans. Electron.*, Vol.E103-C, 2020.
6. T. Matsui and **Shouhei Kidera** "Virtual Source Extended Range Points Migration Method for Auto-focusing Three-dimensional Terahertz Imaging", *IEEE Geoscience and Remote Sensing Letters*, 2020 (in press).

¹The co-authors directly supervised by Dr. S. Kidera are underlined.

7. K. Kanazawa, K. Noritake, Y. Takaishi and **Shouhei Kidera** "Microwave Imaging Algorithm Based on Waveform Reconstruction for Microwave Ablation Treatment", *IEEE Trans. Antennas & Propagation*, vol. 68, no. 7, pp. 5613-5625, July 2020.
8. M. Setsu, T. Hayashi, J. He and **Shouhei Kidera** "Super-Resolution Doppler Velocity Estimation by Kernel-Based Range- τ Point Conversions for UWB Short-Range Radars", *IEEE Trans. Geoscience & Remote Sensing*, Vol. 59, 2020
9. Takamaru Matsui and **Shouhei Kidera** "Range Points Migration Based Spectroscopic Imaging Algorithm for Wide-beam Terahertz Subsurface Sensor", *Trans. Electron.* Vol.E102-C, 2019.
10. Kazuki Noritake and **Shouhei Kidera** "Surface Clutter Suppression with FDTD Recovery Signal for Microwave UWB Mammography", *IEICE Trans. Electron.*, Vol.E102-C, 2019.
11. Kazuki Noritake and **Shouhei Kidera** "Boundary Extraction Enhanced Distorted Born Iterative Method for Microwave Mammography", *IEEE Antenna Wireless Propagation Letters*, 2019 (in press).
12. Yoshiki Akiyama and **Shouhei Kidera** "Low Complexity Algorithm for Range Points Migration Based Human Body Imaging for Multi-static UWB Radars", *IEEE Geoscience and Remote Sensing Letters*, (in press)
13. Masafumi Setsu, and **Shouhei Kidera** "Range Points Migration and Doppler Based Multi-path Exploitation Method for UWB Through-the-wall Radar ", *IET Radar, Sonar & Navigation.*, 2018 (in press).
14. Shuto Takahashi and **Shouhei Kidera** "Acceleration of Range Points Migration Based Microwave Imaging for Non-destructive Testing", *IEEE Antenna Wireless Propagation Letters*, Vol. 17, No.4, Apr., 2018.
15. Masanari Noto, Fang Shang, **Shouhei Kidera** and Tetsuo Kirimoto, "Super-Resolution Time of Arrival Estimation Using Random Resampling in Compressed Sensing", *IEICE Trans. Commun.*, Vol. E101-B, No.6, Jun., 2018.
16. Ayumi Yamaryo, Tatsuo Takatori, **Shouhei Kidera**, and Tetsuo Kirimoto, "Range Points Migration Based Image Expansion Method Exploiting Fully Polarimetric Data for UWB Short Range Radar", *IEEE Trans. Geoscience & Remote Sensing*, Vol. 56, No.4, pp.2170-2182, Dec., 2017.
17. **Shouhei Kidera**, Luz Maria Neira, Barry D. Van Veen and Susan C. Hagness, "TDOA-Based Microwave Imaging Algorithm for Real-Time Microwave Ablation Monitoring ", *International Journal of Microwave and Wireless Technologies*, Cambridge University Press., Vol. 10, pp169-178, Mar. 2018.
18. Masanari Noto, Akira Moro, Fang Shang, **Shouhei Kidera** and Tetsuo Kirimoto, "Noise-robust Compressed Sensing Method for Super-resolution TOA Estimation", *IEICE Communication Express*, Vol.E100-B, No.11, pp.2087-2093, Nov. 2017.
19. Ryo Oyama, **Shouhei Kidera** and Tetsuo Kirimoto, "Surface Height Change Estimation Method Using Band-divided Coherence Functions with Fully Polarimetric SAR images", *IEICE Trans. Commun.*, Vol.E100-B, No.11, pp.2087-2093, Nov. 2017.
20. Yuta Sasaki, Fang Shang, **Shouhei Kidera** and Tetsuo Kirimoto, "Accurate 3-dimensional Imaging Method by Multi-static RPM with Range Point Clustering for Short Range UWB Radar", *IEICE Trans. Commun.* Vol. E100-B, No. 8 pp. 1498-1506, Aug., 2017.
21. Takayuki Masuo, Fang Shang, **Shouhei Kidera**, Tetsuo Kirimoto Hiroshi SAKAMAKI and Nobuhiro SUZUKI, "Parametric Wind Velocity Vector Estimation Method for Single Doppler LIDAR Model", *IEICE Trans. Commun.*, Vol.E100-B, No.3, pp.465-472, March, 2017.
22. Yuta Sasaki, Fang Shang, **Shouhei Kidera**, Tetsuo Kirimoto, Kenshi Saho and Toru Sato, "Three-dimensional Imaging Method Incorporating Range Points Migration and Doppler Velocity Estimation for UWB Millimeter-wave Radar", *IEEE Geoscience and Remote Sensing Letters*, vol. 14, no. 1, pp. 122-126, Jan, 2017.
23. Toshiki Manaka, **Shouhei Kidera** and Tetsuo Kirimoto, "Experimental Study on Embedded Object Imaging Method with Range Point Suppression of Creeping Wave for UWB Radars", *IEICE Trans. Electron.* Vol.E99-C, No.1, pp.138-142, Jan. 2016.
24. Shouhei Ohno, **Shouhei Kidera** and Tetsuo Kirimoto, "Supervised SOM Based ATR Method with Circular Polarization Basis of Full Polarimetric Data", *IEICE Trans. Commun.*, Vol.E98-B, No.12, pp. 2520-2527, Dec. 2015.
25. Takuya Niimi, **Shouhei Kidera** and Tetsuo Kirimoto, "Dielectric Constant and Boundary Extraction Method for Double-Layered Dielectric Object for UWB Radars", *IEICE Trans. Electron.* Vol.E98-C, No.12, pp.1134-1142, Dec. 2015.
26. Ryo Oyama, **Shouhei Kidera**, Tetsuo Kirimoto, "Accurate Coherent Change Detection Method Based on Pauli Decomposition for Fully Polarimetric SAR Imagery", *IEICE Trans. Commun.*, vol. E98-B, no. 7, pp. 1390-1395, July, 2015.
27. Ryo Yamaguchi, **Shouhei Kidera**, Tetsuo Kirimoto, "3-dimensional Imaging and Motion Estimation Method of Multiple Moving Targets for Multi-static UWB Radar Using Target Point and its Normal Vector", *IEICE Trans. Commun.*, vol. E97-B, no. 12, pp. 2819-2829, Dec., 2014.
28. Shuri Kondo, **Shouhei Kidera**, Tetsuo Kirimoto, "Target Detection Algorithm using Independent Component Analysis for Pulse Doppler Radar" , *IEICE Communication Express*, vol. 3, No. 7, pp. 211-216, July, 2014.
29. Ayumi Yamaryo, **Shouhei Kidera**, Tetsuo Kirimoto, "Accurate Target Extrapolation Method Exploiting Double Scattered Range Points for UWB radar", *IEICE Trans. Electron.*, vol. E97-C No. 8 pp. 828-832, Aug, 2014.

30. Shouhei Ohno, **Shouhei Kidera**, Tetsuo Kirimoto, "Efficient SOM Based ATR Method for SAR Imagery with Azimuth Angular Variations", *IEEE Geoscience and Remote Sensing Letters*, vol. 11, No. 11, pp. 1901-1905, Nov., 2014.
31. Ryo Nakamata, **Shouhei Kidera and** Tetsuo Kirimoto, "Accurate Height Change Estimation Method Using Phase Interferometry of Multiple Band-Divided SAR Images", *IEICE Trans. Commun.*, vol. E97-B, No. 6, pp. 1205-1214, June, 2014.
32. Ryunosuke Souma, **Shouhei Kidera**, Tetsuo Kirimoto, "Accurate Permittivity Estimation Method for 3-dimensional Dielectric Object with FDTD-based Waveform Correction" , *IEICE Trans. Electronics*, vol. E97-C, no. 2, (in press) 2014.
33. Jing-Chao Li, Yi-Bing Li, **Shouhei Kidera** and Tetsuo Kirimoto, "A Robust Signal Recognition Method for Communication System under Time-varying SNR Environment", *IEICE Trans. Information and System.*, vol. E96-D, no. 12, pp. 2814–2819, Dec., 2013.
34. **Shouhei Kidera** and Tetsuo Kirimoto, "Efficient Three-Dimensional Imaging Method Based on Enhanced Range Points Migration for UWB Radars", *IEEE Geoscience and Remote Sensing Letters*, vol. 10, no. 5, pp. 1104–1108, Sep., 2013.
35. Ryo Yamaguchi, **Shouhei Kidera** and Tetsuo Kirimoto, "Accurate Imaging Method for Moving Target with Arbitrary Shape for Multi-static UWB Radar", *IEICE Trans. Commun.*, vol. E96-B, no. 7, pp. 2014–2023, Jul., 2013.
36. Tetsuhiro Okano, **Shouhei Kidera** and Tetsuo Kirimoto, " Super Resolution TOA Estimation Algorithm with Maximum Likelihood ICA Based Pre-processing" , *IEICE Trans. Commun.*, vol. E96-B, no. 5, pp. 1194–1201, May 2013.
37. Ryunosuke Souma, **Shouhei Kidera**, Tetsuo Kirimoto, "Accurate Permittivity Estimation Method with Iterative Waveform Correction for UWB Internal Imaging Radar" , *IEICE Trans. Electronics*, vol. E96-C, no. 5, pp. 730-737, May 2013.
38. **Shouhei Kidera** and Tetsuo Kirimoto, "Robust and Accurate Image Expansion Algorithm Based on Double Scattered Range Points Migration for UWB Imaging Radars", *IEICE Trans. Commun.* vol.E96-B, no. 4, pp. 1061-1069, Apr. 2013.
39. Yoshihiro Niwa, **Shouhei Kidera**, Tetsuo Kirimoto, "Image Expansion Approach for Target Buried in Dielectric Medium with Extended RPM to Multi-static UWB Radar" , *IEICE Trans. Electronics* (Brief paper), vol. E96-B, No. 1, pp.119-123, Jan.,2013..
40. **Shouhei Kidera** and Tetsuo Kirimoto, "Accurate and Robust Automatic Target Recognition Method for SAR Imagery with SOM-Based Classification", *IEICE Trans. Commun.* vol.E95-B, no. 11, pp. 3556-3562, Nov., 2012..
41. Tetsuhiro Okano, **Shouhei Kidera** and Tetsuo Kirimoto, "MLICA-based Separation Algorithm for Complex Sinusoidal Signals with PDF Parameter Optimization" , *IEICE Trans. Commun.*,vol. E95-B,No.11 pp.3563-3571, Nov., 2012.
42. **Shouhei Kidera**, Hiroyuki Yamada and Tetsuo Kirimoto, "Accurate 3-dimensional Imaging Method Based on Extended RPM for Rotating Target Model", , *IEICE Trans. Commun.* vol.E95-B, no. 10, pp. 3279-3289, Oct., 2012.
43. Ken Akune, **Shouhei Kidera** and Tetsuo Kirimoto, "Accurate and Nonparametric Imaging Algorithm for Targets Buried in Dielectric Medium for UWB Radars" , *IEICE Trans. Electronics.*,vol. E95-C, no. 8, pp. 1389-1398, Aug., 2012.
44. Yoriaki Abe, **Shouhei Kidera** and Tetsuo Kirimoto, "Accurate Image Expansion Method Using Range Points Based Ellipse Fitting for UWB Imaging Radar" , *IEICE Trans. Commun.*,vol. E95-B, no. 7, pp. 2424-2432, July, 2012.
45. **Shouhei Kidera** and Tetsuo Kirimoto, " Fast and Shadow Region 3-dimensional Imaging Algorithm with Range Derivative of Doubly Scattered Signals for UWB Radars", *IEEE Trans. on Antennas and Propagation*, vol.60, No. 2, pp. 984–996, Feb, 2012.
46. Kenshi Saho, Tomoki Kimura, **Shouhei Kidera**, Hirofumi Taki, Takuya Sakamoto and Toru Sato, "Robust and Accurate Ultrasound 3-D Imaging Algorithm Incorporating Adaptive Smoothing Techniques" , *IEICE Trans. Commun.*,vol. E95-B, No. 2, pp. 572–580, Feb., 2012.
47. Yoriaki Abe, **Shouhei Kidera**, Tetsuo Kirimoto, "Accurate and Omni-directional UWB Radar Imaging Algorithm with RPM Method Extended to Curvilinear Scanning Model" , *IEEE Geoscience and Remote Sensing Letters*, vol. 9, No. 1, pp. 144-148, Jan., 2012.
48. Takehiro Hoshino, **Shouhei Kidera**, Tetsuo Kirimoto, "Accurate Surface Change Detection Method Using Phase of Coherence Function on SAR Imagery" , *IEICE Trans. Commun.*, vol. E95-B, No. 1, pp. 263–270, Jan, 2012.
49. **Shouhei Kidera**, Takuya Sakamoto and Toru Sato, "Extended Imaging Algorithm Based on Aperture Synthesis with Double Scattered Waves for UWB Radars", *IEEE Trans. on Geoscience and Remote Sensing*, vol.49, no.12, pp. 5128–5139, Dec., 2011.
50. Waqas Muhammad, **Shouhei Kidera** and Tetsuo Kirimoto, "PCA-Based Detection Algorithm of Moving Target Buried in Clutter in Doppler Frequency Domain" , *IEICE Trans. Commun.* (Letter), vol. E94-B, No. 11, pp. 3190–3194, Nov., 2011.
51. Ken Akune, **Shouhei Kidera**, Tetsuo Kirimoto, "Acceleration for Shadow Region Imaging Algorithm with Multiple Scattered Waves for UWB Radars" , *IEICE Trans. Commun.* (Letter), vol. E94-B, No. 9, pp.2696–2699, Sep, 2011.
52. **Shouhei Kidera** and Tetsuo Kirimoto, "Multi-Static UWB Radar Approach Based on Aperture Synthesis of Double Scattered Waves for Shadow Region Imaging", *IEICE Trans. Electronics*, (Brief Paper), vol.E94-C, No. 8, pp. 1320–1323, Aug, 2011.

53. **Shouhei Kidera**, Takuya Sakamoto and Toru Sato, "Super-Resolution UWB Radar Imaging Algorithm Based on Extended Capon with Reference Signal Optimization", *IEEE Trans. Antennas & Propagation*, vol.59, no. 5, pp. 1606–1615, May, 2011.
54. **Shouhei Kidera**, Takuya Sakamoto and Toru Sato, "Accurate UWB Radar 3-D Imaging Algorithm for Complex Boundary without Range Points Connections", *IEEE Trans. Geoscience and Remote Sensing*, vol.48, no. 4, pp. 1993–2004, Apr., 2010.
55. **Shouhei Kidera**, Takuya Sakamoto and Toru Sato, "High-Resolution 3-D Imaging Algorithm with an Envelope of Modified Spheres for UWB Through-the-Wall Radars", *IEEE Trans. Antennas & Propagation*, vol.57, no.11, pp. 3520–3529, Nov., 2009.
56. **Shouhei Kidera**, Takuya Sakamoto and Toru Sato, "High-resolution and Real-Time 3-D Imaging Algorithm with Envelope of Spheres for UWB Radars" , *IEEE Trans. Geoscience and Remote Sensing*, vol.46, no.11, pp.3503–3513, Nov, 2008.
57. **Shouhei Kidera**, Yusuke Kani, Takuya Sakamoto and Toru Sato, "Fast and Accurate 3-D Imaging Algorithm with Linear Array Antennas for UWB Pulse Radars", *IEICE Trans. Commun.*, vol.E91-B, no.8, pp. 2683–2691, Aug, 2008.
58. **Shouhei Kidera**, Takuya Sakamoto and Toru Sato, "A robust and fast imaging algorithm with an envelope of circles for UWB pulse radars", *IEICE Trans. Commun.*, vol.E90-B, no.7, pp.1801–1809, Jul, 2007.
59. **Shouhei Kidera**, Takuya Sakamoto and Toru Sato, "A high-resolution imaging algorithm without derivatives based on waveform estimation for UWB pulse radars", *IEICE Trans. Commun.*, vol.E90-B, no.6, pp.1487–1494, Jun, 2007.
60. (In Japanese) Takuya Sakamoto, **Shouhei Kidera**, Takuya Sakamoto and Toru Sato, "An experimental study on a fast 3-D imaging algorithm for UWB pulse radars", *IEICE Trans. Commun.*, Japanese Edition, vol.J90-B, no.1, pp.66-73, Jan, 2007.
61. **Shouhei Kidera**, Takuya Sakamoto, Toru Sato and Satoshi Sugino, "An accurate imaging algorithm with scattered waveform estimation for UWB pulse radars", *IEICE Trans. Commun.*, vol. E89-B, no. 9, pp. 2588-2595, Sep, 2006

Invited Presentations

1. Takahide Morooka and **Shouhei Kidera**, "Bi-directional Updating Algorithm for ROI and Dielectric Profile in CSI Framework for Microwave Subsurface Imaging" 2020 International Symposium on Antennas and Propagation (ISAP2020), Osaka, Japan, Jan., 2021. (Invited)
2. **Shouhei Kidera** and Kazuki Noritake, "Accuracy Enhanced Distorted Born Iterative Method with Envelope Based Boundary Extraction for Microwave Mammography" 2018 Progress in Electromagnetics Research Symposium (PIERS 2018), Toyama, Japan, Aug. 2018. (invited)
3. **Shouhei Kidera** and Shuto Takahashi, "Accurate Boundary Extraction Method by Range Points Migration for Microwave Non-destructive Monitoring," 2017 Asia-Pacific Conference on Antennas and Propagation (APCAP2017), Xian, China, Oct., 2017, (Invited lecture).
4. **Shouhei Kidera** and Kazuki Noritake, "Boundary Extraction Based Imaging Method by Incorporating FDTD Based Wavefront Analysis for Microwave Mammography," International Conference on Electromagnetics in Advanced Applications (ICEAA 2017), Verona, Italy, Sep., 2017, (Invited lecture).
5. **Shouhei Kidera**, Yuta Sasaki, Shang Fang, Tetsuo Kirimoto, Kenshi Saho and Toru Sato "Accuracy Enhanced RPM Method Using DopplerBased Range Points Clustering for 140GHz BandUWB Radar," 2016 International Symposium on Antennas and Propagation (ISAP2016), Okinawa, Japan, Oct., 2016. (Invited)
6. **Shouhei Kidera**, "Accurate Boundary Extraction and Dielectric Constant Estimation Method for UWB Internal Imaging Radar", URI Commission B, International Symposium on Electromagnetic Theory (EMTS 2016), Espoo, Finland, 14-18 Aug., 2016. (Invited)
7. **Shouhei Kidera**, "SUPER-RESOLUTION AND ACCURATE 3-DIMENSIONAL IMAGING METHOD BY COMBINING EM COMPUTATIONAL ANALYSIS IN SHORT RANGE UWB RADAR," URSI Atrantic Radio Science Conference (AT-RASC 2015)2015, Gran Canaria, Canary Island, Spain, May, 2015.
8. **Shouhei Kidera**, "Short range UWB radar imaging method," The 57th Automatic Control Conference, Ikaho, Gunma, Japan. Nov. 2014
9. **Shouhei Kidera**, "Near Field Imaging Method for UWB Radar System," The 4th Trans-disciplinary Federation of Science and Technology Conference, Kanazawa, Japan. Nov. 2011
10. **Shouhei Kidera** and Tetsuo Kirimoto, "Emerging Trend of Imaging Radar Techniques," Technical Lecture on Mitsubishi Advanced Technology R&D Center, Hyogo, Japan. Sep, 2010.
11. **Shouhei Kidera**, "Extended Imaging Algorithms for Super-Resolution Radar Techniques," Taiwan-Japan Joint Workshop on Inverse Problem, Institute of Mathematics, Academia Sinica, Taipei, Taiwan. Nov. 2008.
12. **Shouhei Kidera**, "Inverse Problem in Pulse Radar Imaging Techniques," Taiwan-Japan Joint Workshop on Inverse Problem, Institute of Mathematics, Academia Sinica, Taipei, Taiwan. Feb. 2007.

1. Hongyang Zhang and **Shouhei Kidera**, "Polarimetric Signature CNN based Complex Permittivity Estimation for Microwave Non-destructive Testing" 2020 International Symposium on Antennas and Propagation (ISAP2020), Osaka, Japan, Jan., 2021.
2. Hayatomomaru Morimoto and **Shouhei Kidera**, "Complex Permittivity Reconstruction For Multi-layered Object By Low Complexity Contrast Source Inversion Method" 45th International Conference on Infrared, Millimeter, and Terahertz Waves 2020 (IRMMW-THz 2020), Nov., Buffalo, NY, USA, 2020.
3. Tomoki Omori, Yusuke Isono, Katsuhiko Kondo, Yusuke Akamine, and **Shouhei Kidera**, "k-Space Decomposition Based Super-resolution Three-dimensional Imaging Method for Millimeter Wave Radar" 2020 IEEE Radar Conference, Florence, Italy, Sep., 2020.
4. Takeru Ando and **Shouhei Kidera**, "Super-resolution Doppler Velocity and Range Estimator for Short-range Human Recognition Radar" 2020 IEEE Radar Conference, Florence, Italy, Sep., 2020.
5. Hiroki Sato and **Shouhei Kidera**, "Accuracy Enhanced Contrast Source Inversion Algorithm for Microwave Breast Tumor Detection" 2020 General Assembly and Scientific Symposium of the International Union of Radio Science (URSI GASS 2020), Rome, Italy, Sep, 2020.
6. Takahiro Hanabusa and **Shouhei Kidera**, "Experimental Validation for ROI prior Contrast Source Inversion Algorithm for Microwave NDT Model" 2020 General Assembly and Scientific Symposium of the International Union of Radio Science (URSI GASS 2020), Rome, Italy, Sep, 2020.
7. Takumi Hayashi and **Shouhei Kidera**, "Bi-directional Processing Algorithm with RPM and WKD Based Doppler Velocity Estimator for 3-D Doppler-Radar Imaging" 2020 IEEE Geoscience and Remote Sensing Symposium, IGARSS 2020, Hawaii, US, Aug, 2019. (Poster)
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¹The names of students directly supervised by Dr. S. Kidera are underlined.

²First author is presenting author.

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32. Yoshiki Akiyama and **Shouhei Kidera**, "Acceleration for RPM-Based Three-Dimensional Imaging for 140GHz-Band Millimeter Wave Radar" 2017 International Symposium on Antennas and Propagation (ISAP2017), Phuket, Thailand, Oct., 2017.
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49. Takuya Niimi, **Shouhei Kidera**, Tetsuo Kirimoto, "Accurate Permittivity Estimation Method for Double-layered Dielectric Object for UWB Radars," 2014 International Symposium on Antennas and Propagation (ISAP2014), Kaohsiung, Taiwan, Dec., 2014.
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51. Ayumi Yamaryo, **Shouhei Kidera**, Tetsuo Kirimoto, "3-dimensional imaging method exploiting full polarimetric data for UWB short range radar", International Conference on Space, Aeronautical and Navigation Electronics (ICSANE) 2014, Mareka, Malaysia, 22-24, October, 2014.
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63. Ryunosuke Souma, **Shouhei Kidera** and Tetsuo Kirimoto, "Accurate Permittivity Estimation Algorithm by Compensating Waveform Deformation for UWB Internal Imaging Radar", 2012 IEEE International Conference on Ultra-Wideband ICUWB 2012, U.S.A, Sep., 2012.
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Scientific Research Grant

1. S. Kidera (PI 100%), **The Canon Foundation, Creation of Industrial Infrastructure** Grant amount: 14.0 Million JPY (About \$ 140,000), Apr. 2019 - Mar. 2021.
2. S. Kidera (PI 100%), **JST PRESTO** “Innovative microwave imaging method by incorporating super-accurate imaging and polarimetric based permittivity estimation” Grant amount: 30.0 Million JPY (About \$ 300,000), Oct. 2017 - Mar. 2021.
3. S. Kidera (PI 100%), **JST Regional Industry-Academia Value Program** Grant amount: 2.0 Million JPY (About \$ 20,000), Oct. 2017 - Sep. 2018.
4. S. Kidera (PI 100%), **The Asahi Glass Foundation** Grant amount: 2.0 Million JPY (About \$ 20,000), Apr. 2017 - Mar. 2019.
5. S. Kidera (PI 100%) **Japan Society for the Promotion of Science (JSPS), Grants-in-Aid for Scientific Research, Scientific Research (B)**, “Research for Super-resolution Non-invasive Biomedical Imaging with UWB Radar”, Grant amount: 13.5 Million JPY (About \$ 135,000), Apr. 2017 - Mar. 2020.
6. S. Kidera (PI 100%), **Research Foundation for the Electrotechnology of Chubu.**, Grant amount: 1.7 Million JPY (About \$ 17,000), Apr. 2017 - Mar. 2018.
7. S. Kidera (PI 100%), **Strategic Information and Communications R&D Promotion Programme(SCOPE) Phase II, Ministry of Internal Affairs and Communications**, “Development of Super-resolution Imaging Method for Microwave mammography and ablation treatment” Grant amount: 25.79 Million JPY (About \$ 257,790), Jan. 2017 - Mar 2020.
8. S. Kidera (PI 100%), **Japan Society for the Promotion of Science (JSPS), Grants-in-Aid for Scientific Research, (Fund for the Promotion of Joint International Research (Fostering Joint International Research(A))**, “Research for Super-resolution Internal Imaging for UWB sensor”, Grant amount: 8.0 Million JPY (About \$ 70,000), Apr. 2016 - Sep. 2016.
9. S. Kidera (PI 100%), **The Mazda Foundation**, Grant amount: 1.2 Million JPY (About \$ 10,000), Nov. 2015 - Oct. 2016.
10. S. Kidera (Co-PI 30%) and T. Kirimoto (PI 70 %) **Japan Society for the Promotion of Science (JSPS), Grants-in-Aid for Scientific Research, Scientific Research (B)**, “Research for Image Expansion Method using Polarimetric and Multiple Scattering Signals for UWB Short Range Radar”, Grant amount: 15.0 Million JPY (About \$ 150,000), Apr. 2015 - Mar. 2018.
11. S. Kidera (PI 100%), **Japan Society for the Promotion of Science (JSPS), Grants-in-Aid for Scientific Research, Grant-in-Aid for Young Scientists (A)**, “Research for Super-resolution Internal Imaging for UWB sensor”, Grant amount: 17.9 Million JPY (About \$ 179,000), Apr. 2014 - Mar. 2017.
12. S. Kidera (Affiliation PI 100%), **Ministry of Internal Affairs and Communications**, “Development for 140 GHz Short Range Radar” Grant amount: 22.80 Million JPY (About \$ 228,000), Sep. 2014 - Mar. 2017.
13. S. Kidera (PI 100%), **Japan Prize Foundation**, “Research for Innovative Super-resolution Internal Imaging Method for UWB Radar” Grant amount: 1.0 Million JPY (About \$ 10,000), Sep. 2013 - Mar. 2014.
14. S. Kidera (PI 100%), **Strategic Information and Communications R&D Promotion Programme(SCOPE) Phase I, Ministry of Internal Affairs and Communications**, “Development of Super-resolution Imaging Method for Non-invasive and Non-destruction UWB Radar” Grant amount: 2.89 Million JPY (About \$ 28,900), Sep. 2013 - Mar. 2014.
15. S. Kidera (PI 100%), **The Murata Science Foundation**, “Development of Super-resolution and Shadow Region Imaging for UWB Radar” Grant amount: 1.9 Million JPY (About \$ 19,000), July. 2013 - June. 2014.
16. S. Kidera (PI 100%), **The Support Center for Advanced Telecommunications Technology Research, Foundation (SCAT)**, “Development of Far Field and Shadow Region Imaging for UWB Radar” Grant amount: 2.5 Million JPY (About \$ 25,000), Apr. 2013 - Mar. 2014.
17. S. Kidera (PI 100%), **Ozawa Yoshikawa Memorial Foundation for Electronics**, “Development of Super-resolution Non-invasive Human Body Imaging Method for UWB Radar”, Grant amount: 3.0 Million JPY (About \$ 30,000), Apr. 2013 - Mar. 2014.
18. S. Kidera (PI 100%), **The KDDI Foundation**, “Research for Super-resolution Non-invasive Imaging Method Beyond Wavelength for UWB Radar”, Grant amount: 2.8 Million JPY (About \$ 28,000), Apr. 2013 - Mar. 2015.
19. S. Kidera (PI 100%), **Yazaki Memorial Foundation for Science and Technology**, “Super-resolution 3-D Imaging Method for UWB Radar”, Grant amount : 1.0 Million JPY (About \$ 10,000), Apr. 2013 - Mar. 2014.
20. S. Kidera (PI 100%), **Tateishi Science And Technology Foundation** “Research for Super-resolution UWB Sensor for Dielectric Medium Using Multiple Scattering Signals”, Grant amount: 2.1 Million JPY (About \$ 21,000), Apr. 2012 - Mar. 2013.
21. S. Kidera (PI 100%), **The Kurata Memorial Hitachi Science and Technology Foundation**, “Research for Super-resolution Imaging Method for Buried Object in Dielectric Medium Using Multiple Scattering Signal”, Grant amount: 1.2 Million JPY (About \$ 12,000), Apr. 2012 - Mar. 2013.

22. S. Kidera (PI 100%), **The Sumitomo Electric Group Basic**, “Research for Super-resolution and Quasi-Near Field UWB Radar Imaging Technique Under Narrower Observation Region”, Grant amount: 0.9 Million JPY (About \$ 9,000), Apr. 2012 - Mar. 2013.
23. S. Kidera (PI 100%), **Japan Society for the Promotion of Science (JSPS), Grants-in-Aid for Scientific Research, Grant-in-Aid for Young Scientists (B)**, “Research for Quasi-Near Field and Super-resolution Radar Sensor for Autonomous Robot”, Grant amount: 4.5 Million JPY (About \$ 45,000), Apr. 2012 - Mar. 2013.
24. S. Kidera (PI 100%), **TEPCO Memorial Foundation, Research Grant (Basic Research)** “Research for Super-resolution Internal Imaging Method for Dielectric Object for UWB Radar”,
Grant amount: 10.0 Million JPY (About \$ 100,000), Apr. 2011 - Mar. 2014.
25. S. Kidera (PI 100%), **The Nakajima Foundation**, “Research for Super-resolution Internal Radar Sensor Using Frequency Domain Interferometry of UWB Signal”, Grant amount: 3.0 Million JPY (About \$ 30,000), Apr. 2011 - Mar. 2012.
26. S. Kidera (PI 100%), **The Casio Scientific Foundation**, “Research for High-resolution Imaging Imaging Method for Indoor Measurement and Target Recognition”, Grant amount: 1.0 Million JPY (About \$ 10,000), Apr. 2011 - Mar. 2012.
27. S. Kidera (Co-PI 30%) and T. Kirimoto (PI 70 %) **Japan Society for the Promotion of Science (JSPS), Grants-in-Aid for Scientific Research, Scientific Research (B)**, “Research for Super-resolution Radar Technique Using Multiple Scattering Environment for Collision Avoidance Robot”, Grant amount: 14.4 Million JPY (About \$ 144,000), Apr. 2010 - Mar. 2013.
28. S. Kidera (PI 100%), **Japan Society for the Promotion of Science (JSPS), Grants-in-Aid for Scientific Research, Research Activity Start-up**, “Pioneering Research for Super-resolution UWB Radar Technique”, Grant amount: 2.7 Million JPY (About \$ 27,000), Apr. 2009 - Mar. 2011.
29. S. Kidera (PI 100%), **Japan Society for the Promotion of Science (JSPS), Grants-in-Aid for JSPS Fellow**, “Research for Fast and High-resolution Target Shape Estimation Method for UWB Pulse Radar”, Grant amount: 1.8 Million JPY (About \$ 18,000), Apr. 2007 - Mar. 2009.

Teaching Activity

Graduate Courses

Basic Theory for Control System Design (MATLAB Programming, Adaptive Array Signal Processing): Spring 2010, 2011, 2012, 2013, Fall 2010, 2011, 2012, 2013

Advanced Bioelectromagnetics: 2014-2019

Undergraduate Courses

Electronics Experiment (Digital Circuit): Fall 2009

Electronics Experiment (Inverted Pendulum Control): Fall 2011

Basic Scientific Experiment (Electrical Circuit, Photoelectric effect): Spring 2010, 2011, Fall 2012, 2013

Intelligent Mechanical Engineering Experiment (Logic Circuit): Spring 2012, 2013, Fall 2012, 2013

Measurement Engineering: 2014-2019

Oscillation and Wave: 2016-2019

Student Supervised

M.E. Degrees Completed

Yoshiki Akiyama, M.E., "High-resolution Three-dimensional Radar Imaging Based on Wavenumber Space Decomposition for Short Range Radar", Mar. 2019 (Student Commendation in UEC)

Shuto Takahashi, M.E., "Incorporation Algorithm for RPM and Inverse Scattering Approaches for Microwave Non-destructive Testing", Mar. 2019 (Student Commendation in UEC)

Kazuki Kanazawa, M.E., "Accurate and Fast Zone monitoring for Microwave Ablation Breast Cancer Treatment", Mar. 2018

Kazuki Noritake, M.E., "Incorporation Algorithm for Boundary Extraction and Inverse Scattering Algorithms for Microwave Mammography", Mar. 2016

Tatsuo Takatori, M.E., "Permittivity Estimation by Incorporating RPM and Ellipsometry for Microwave Non-destructive Testing", Mar. 2018 (Student Commendation in UEC)

Masafumi Setsu, M.E., "Super-resolution Doppler Velocity Estimation and Multiple Scattering Exploitation for Microwave Through-the-wall Radar", Mar. 2016 (Student Commendation in UEC)

Yuta Sasaki, M.E., "Accurate and Fast Three-dimensional RPM Method for 140GHz-band Millimeter Wave Radar", Mar. 2016 (Student Commendation in UEC)

Ayumi Yamaro, M.E., "Accurate Image Extrapolation Method Using Full Polarimetric Data Learning for UWB Short Range Radar", Mar. 2015 (Student Commendation in UEC)

Takuya Niimi, M.E., "Accurate Dielectric Constant Estimation for Double Layered Medium with Extended Envelope Method", Mar. 2015 (Student Commendation in UEC)

Yoshihiro Niwa, M.E., "Experimental Study on Accurate Dielectric Constant Estimation Incorporating RPM and FDTD Method for UWB Internal Imaging Radar", Mar. 2014

Ryunosuke Souma, M.E., "Accurate Permittivity Estimation Method Using Waveform Compensation with FDTD for UWB Internal Imaging Technique", Mar. 2013 (Student Commendation in UEC)

Ryo Yamaguchi, M.E., "Moving Target Imaging Method Using Multi-static Observation Model for UWB Radars", Mar. 2013 (Meguro Award in UEC)

Yoriaki Abe, M.E., "Accurate Image Expansion Method Using Range Points Based Ellipse Fitting for UWB Radars", Mar. 2012 (Student Commendation in UEC)

Ken Akune, M.E., "Accurate Imaging Method for Object Buried in Dielectric Medium by Advanced RPM Method", Mar. 2012 (Student Commendation in UEC)

B.E Degrees Completed

Umita Hirose, B.E., Mar. 2019

Hayatomomaru Morimoto, B.E., Mar. 2019

Takahiro Hanabusa, B.E., Mar. 2019

Tomoki Oomori, B.E., Mar. 2019

Takamaru Matsui, B.E., Mar. 2018

Takumi Hayashi, B.E., Mar. 2018

Yui Himeno, B.E., Mar. 2017

Kazuki Noritake, B.E., Mar. 2017

Shuto Takahashi, B.E., Mar. 2017

Yoshiki Akiyama, B.E., Mar. 2017

Sota Yamagishi, B.E., Mar. 2016

Tatsuo Takatori, B.E., Mar. 2016

Risako Tanaka, B.E., Mar. 2016

Fuki Endo, B.E., Mar. 2016

Ikki Kishida, B.E., "Parametric Dielectric Constant Estimation for UWB Internal Imaging Radar", Mar. 2015

Takaya Taniguchi, B.E., "Ellipse Based Extrapolation Method for UWB Through The Wall Imaging Radar", Mar. 2014

Toshiki Manaka, B.E., "Experimental Study on Accurate Dielectric Constant Estimation Method for UWB Internal Imaging Radar", Mar. 2014

Takuya Niimi, B.E., "Accurate Permittivity Estimation Method Using Reflection Echo from Internal Object for UWB Radar", Mar. 2013

Ayumi Yamaro, B.E., "Image Expansion Method Using Multiple Scattering Signal for UWB Indoor Sensing", Mar. 2013

Yoshihiro Niwa, B.E., "Accurate Image Expansion Method by Multi-static Observation Model for UWB Internal Radar", Mar. 2012

Yusuke Harano, B.E., "Accuracy Enhancement for UWB Radar Image Using Phase Discrimination of Capon Output", Mar. 2012

Ryunosuke Souma, B.E., "Permittivity Estimation Method for UWB Internal Imaging Technique", Mar. 2011

Ryo Yamaguchi, B.E., "Moving Target Estimation Method Using Multi-static Observation for UWB Indoor Sensor", Mar. 2011

Kenta Shigeno, B.E., "Super-Resolution TOA Estimation Method Using Independent Component Analysis for UWB Imaging Radar", Mar. 2011

Yoriaki Abe, B.E., "Omni-directional Imaging Method with Arbitrary Scanning Orbit for UWB Robotic Sensor", Mar. 2010

Ken Akune, B.E., "Acceleration for Shadow Region Imaging using Multiple Scattering Waves for UWB Radar", Mar. 2010

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