

## Takuya Sakamoto

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University of Hyogo  
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### Research Area

Radar systems, wireless sensing, microwave imaging, and radar signal processing

### Ph.D. Dissertation

Ph.D in Informatics, Kyoto University, January 2005  
"Nonparametric imaging algorithms for UWB pulse radars"

### Educational Background

2005	PhD, Communications and Computer Engineering, Grad. School of Informatics, Kyoto University Thesis Advisor: Prof. Toru Sato
2002	M.I., Communications and Computer Engineering, Grad. School of Informatics, Kyoto University
2000	B.E., Electrical and Electronic Engineering, Kyoto University

### Professional Employment

PRESTO Researcher, Japan Science and Technology Agency, Kawaguchi, Japan	Oct. 2018 - present
Visiting Scholar, Univ. of Hawaii at Manoa, Dept. Electrical Eng., Honolulu, USA	Apr. 2017 - Sep. 2017
Visiting Researcher, Delft University of Technology, Delft, The Netherlands	Aug. 2016 - Sep. 2016
Visiting Researcher, Delft University of Technology, Delft, The Netherlands	Mar. 2016
Visiting Researcher, Delft University of Technology, Delft, The Netherlands	Sep. 2015
Associate Professor, Univ. of Hyogo, Grad. School of Engineering, Himeji, Japan	Apr. 2015 - present
Part-time Researcher, Kyoto University, Grad. School of Informatics, Kyoto, Japan	Apr. 2015 - present
Visiting Researcher, Delft University of Technology, Delft, The Netherlands	Sep. 2011 - Nov. 2013
Visiting Researcher, University of Nice Sophia-Antipolis, Antibes, France	Sep. 2009
Assistant Professor, Kyoto University, Grad. School of Informatics, Kyoto, Japan	Apr. 2007 - Mar. 2015
Research Associate, Kyoto University, Grad. School of Informatics, Kyoto, Japan	Apr. 2006 - Mar. 2007
JSPS PD Researcher, Kyoto University, Grad. School of Informatics, Kyoto, Japan	Apr. 2005 - Mar. 2006
Lecturer (Researcher), Kyoto Univ., Grad. School of Engineering, Kyoto, Japan	Feb. 2005 - Mar. 2005

### Awards

2018	Achievement Award, Institute of Electron., Information and Commun. Engineers, Commun. Society
2016	Masao Horiba Award
2015	Achievement Award, Institute of Electron., Information and Commun. Engineers, Commun. Society
2012	Best Paper Award, International Symposium on Antennas and Propagation
2007	Young Researchers Award, Institute of Electronics, Information and Communication Engineers
2007	Best Presentation Award, Institute of Electrical Engineers of Japan
2007	Best Paper Award, IEICE Communications Society
2004	Paper Award, International Symposium on Antennas and Propagation

### Professional Service

Vice Chair	International Symposium on Antennas and Propagation 2020 Registration Committee	2018 - present
Publications Co-Chair	IEEE International Geoscience and Remote Sensing Symposium 2019	2018 - present
Associate Editor	IEICE Transactions on Communications	2018 - present
Review Committee	13th European Conference on Antennas and Propagation	2018 - present
Secretary	IEEE Antennas and Propagation Society Kansai Joint Chapter	2017 - present

Secretary	IEEJ Technical Committee on Electromagnetic Theory	2018 - present
Associate Editor	IEICE Electronics Express	2016 - present
Steering Committee	IEICE Kansai Section	2016 - 2018
Editorial Secretary	IEICE Transactions on Communications Special Section on Recent Progress in Electromagnetic Theory and Its Applications	2016 - present
Secretary	IEICE Technical Committee on Electromagnetic Theory	2016 - 2018
Session Convener	European Conference on Antennas and Propagation	2016
Guest Associate Editor	IEICE Trans. Electronics Special Section on Recent Advances in Simulation Techniques and Their Applications for Electronics	2015 - 2016
Treasurer	IEEE Antennas and Propagation Society Kansai Joint Chapter	2015 - 2016
Review Committee	IEICE Transactions on Communications	2006 - present
Assistant Secretary	IEEJ Technical committee on electromagnetic theory	2006 - 2008

## **Publications**

- [1] Takuya Sakamoto and Toru Sato, "A target shape estimation algorithm for pulse radar systems based on boundary scattering transform," *IEICE Trans. on Communications*, vol. E87-B, no. 5, pp. 1357-1365, May 2004.
- [2] Takuya Sakamoto and Toru Sato, "An estimation algorithm of target location and scattered waveforms for UWB pulse radar systems," *IEICE Trans. on Communications*, vol. E87-B, no. 6, pp. 1631-1638, June 2004.
- [3] Takuya Sakamoto, Daisuke Umehara, Yoshiteru Morihira, and Makoto Kawai, "A synchronization method for synchronous CDMA broadband communication systems with GEO satellites," *IEICE Trans. on Communications*, vol. E87-B, no. 8, pp. 2111-2118, Aug. 2004.
- [4] Takuya Sakamoto and Toru Sato, "A phase compensation algorithm for high-resolution pulse radar systems," *IEICE Trans. on Communications*, vol. E87-B, no. 11, pp. 3314-3321, Nov. 2004.
- [5] Toru Sato and Takuya Sakamoto, "Image reconstruction algorithms for UWB pulse radar systems", *IEICE Transactions Japanese Edition*, vol. J88-B, no. 12, pp. 2311-2325, Dec. 2005 (in Japanese).
- [6] Shouhei Kidera, Takuya Sakamoto, Satoshi Sugino, and Toru Sato, "An accurate imaging algorithm with scattered waveform estimation for UWB pulse radars," *IEICE Trans. on Communications*, vol. E89-B, no. 9, pp. 2588-2595, Sep. 2006.
- [7] Takuya Sakamoto, Shouhei Kidera, Toru Sato, and Satoshi Sugino, "An experimental study on a fast 3-D imaging algorithm for UWB pulse radars", *IEICE Transactions Japanese Edition*, vol. J90-B, no. 1, pp. 66-73, Jan. 2007 (in Japanese).
- [8] Takuya Sakamoto, "A 2-D image stabilization algorithm for UWB pulse radars with fractional boundary scattering transform," *IEICE Trans. on Communications*, vol. E90-B, no. 1, pp. 131-139, Jan. 2007.
- [9] Takuya Sakamoto, "A fast algorithm for 3-dimensional imaging with UWB pulse radar systems," *IEICE Trans. on Communications*, vol. E90-B, no. 3, pp. 636-644, Mar. 2007.
- [10] Shouhei Kidera, Takuya Sakamoto, and Toru Sato, "A high-resolution imaging algorithm without derivatives based on waveform estimation for UWB radars," *IEICE Trans. on Communications*, vol. E90-B, no. 6, pp. 1487-1494, June 2007.
- [11] Shouhei Kidera, Takuya Sakamoto, and Toru Sato, "A robust and fast imaging algorithm with an envelope of circles for UWB pulse radars," *IEICE Trans. on Communications*, vol. E90-B, no. 7, pp. 1801-1809, July 2007.
- [12] Kentaro Isoda, Takuya Sakamoto, and Toru Sato, "Effective echo detection and accurate orbit estimation

- algorithms for space debris radar,” *IEICE Trans. on Communications*, vol. E91-B, no. 3, pp. 887-895, Mar. 2008.
- [13] 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. on Communications*, vol. E91-B, no. 8, pp. 2683-2691, Aug. 2008.
- [14] 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. on Geoscience and Remote Sensing*, vol. 46, no. 11, pp. 3503-3513, Nov. 2008.
- [15] Takuya Sakamoto and Toru Sato, “2-dimensional imaging of human bodies with UWB radar using approximately uniform walking motion along a straight line with the SEABED algorithm,” *IEICE Trans. on Communications*, vol. E91-B, no. 11, pp. 3695-3703, Nov. 2008.
- [16] Takuya Sakamoto and Toru Sato, “Code-division multiple transmission for high-speed UWB radar imaging with an antenna array,” *IEEE Trans. on Geoscience and Remote Sensing*, vol. 47, no. 4, pp. 1179-1186, Apr. 2009.
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- indoor multipath echoes for a target in shadow regions,” *IEICE Trans. on Communications*, vol. E94-B, no. 8, pp. 2366-2374, Aug. 2011.
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echoes from distributed moving targets in UWB radar signals,” *IEEE Transactions on Geoscience and Remote Sensing*, vol. 53, no. 1, pp. 352-361, Jan. 2015.

- [39] Takuya Sakamoto, Ryohei Imasaka, Hirofumi Taki, Toru Sato, Mototaka Yoshioka, Kenichi Inoue, Takeshi Fukuda, and Hiroyuki Sakai, “Accurate heartbeat monitoring using ultra-wideband radar,” *IEICE Electronics Express*, vol. 12, no. 3, pp. 20141197, Feb. 2015.
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- [52] Takuya Sakamoto, Masashi Muragaki, Kazunori Tamura, Shigeaki Okumura, Toru Sato, Kenji Mizutani, Kenichi Inoue, Takeshi Fukuda, and Hiroyuki Sakai, “Measurement of instantaneous heart rate using radar echoes from the human head,” *Electronics Letters*, doi:10.1049/el.2018.0811, May 2018
- [53] Takuya Sakamoto, Pascal J. Aubry, Shigeaki Okumura, Hirofumi Taki, Toru Sato, and Alexander G. Yarovoy, “Noncontact measurement of the instantaneous heart rate in a multi-person scenario using X-band array radar and adaptive array processing,” *IEEE Journal on Emerging and Selected Topics in Circuits and Systems*, doi:10.1109/JETCAS.2018.2809582, June 2018.
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- [55] Kentaro Oishi, Shigeaki Okumura, Takuya Sakamoto, Toru Sato, Kenji Mizutani, Kenichi Inoue, Takeshi Fukuda, and Hiroyuki Sakai, “Non-contact interbeat interval measurement using higher harmonic components of body surface displacement with ultra-wideband Doppler radar”, *IEICE Transactions Japanese Edition*, vol. J101-C, no. 11, Nov. 2018.
- [56] Takuya Sakamoto, Xiaomeng Gao, Ehsan Yavari, Ashikur Rahman, Olga Boric-Lubecke, and Victor M. Lubecke, “Hand gesture recognition using a radar echo I-Q plot and convolutional neural network”, *IEEE Sensors Letters*, vol. 2, no. 3, pp. 1-4, doi:10.1109/LSENS.2018.2866371, Sep. 2018.

### **International Patents**

Date	Number	Inventors	Title
May 2016	US9693738B2	Mototaka Yoshioka, Takeshi Fukuda, Toru Sato, <u>Takuya Sakamoto</u>	Heartbeat measuring apparatus, heartbeat measuring method, and recording medium
Mar. 2013	US20140213902A1	Kenichi Nagae, Hirofumi Taki, <u>Takuya Sakamoto</u> , Toru Sato	Subject information obtaining apparatus, method for obtaining subject information, and program
Aug. 2012	US9304191B2	Kenichi Nagae, Hirofumi Taki, <u>Takuya Sakamoto</u> , Toru Sato	Subject information obtaining apparatus, subject information obtaining method, and program
May 2012	US8686894B2	Takeshi Fukuda, Kenichi Inoue, Toru Sato, <u>Takuya Sakamoto</u> , Kenshi Saho	Radar imaging apparatus, imaging method, and program thereof
Mar. 2009	US2011/0012774A1	Hiroyuki Sakai, Takeshi Fukuda, Kenichi Inoue, Toru Sato, <u>Takuya Sakamoto</u> , Yusuke Kani	Range finder, shape measuring device, and methods for them
Apr. 2008	US8410978B2	Hiroyuki Sakai, Takeshi Fukuda, <u>Takuya Sakamoto</u> , Toru Sato	Shape measurement instrument and shape measurement method