

May 2022

Curriculum Vitae



Dr. Ichiro Sakuma Professor of the University of Tokyo

Date of Birth: January 16, 1960 Age: 62

EDUCATION

Mar 1982

Bachelor in Engineering
Department of Precision Machinery Engineering
Faculty of Engineering, The University of Tokyo

March 1984

Master of Engineering, Department of Precision Machinery Engineering
Graduate School of Engineering, The University of Tokyo

March 1989

Ph.D. in Precision Engineering (1989)
from Graduate School of Engineering, The University of Tokyo
"Multiwavelength detection system for high performance liquid
chromatography and its application to biological fluid analysis"

WORK EXPERIENCES

April 1985 - Mar 1987

Research Associate
Department of Precision Engineering
Graduate School of Engineering, The University of Tokyo
Research subjects

- Multiwavelength detection system for high performance liquid chromatography
- Artificial Organs (Blood purification system, artificial Pancreas)
- Biomedical instrumentation

April 1987 - Mar. 1998

Research Associate (1997-1991), Instructor(1991-1992),

Associate Professor (1992-1998)

Department of Applied Electronic Engineering

Faculty of Science and Engineering, Tokyo Denki University

Research subjects

- Multiwavelength detection system for high performance liquid chromatography
- Multi-electrodes detection system for high performance liquid chromatography
- Measurement of reentrant activities observed in cardiac arrhythmia (ventricular fibrillation)
- Non-pulsatile cardiac assist circulation
- Oxygenator for respiratory assist

Aug 1990 - Sept. 1991

Research Instructor Department of Surgery,

Baylor College of Medicine. Houston, Texas, The U.S.A

Research subjects

- Non-pulsatile cardiac assist circulation

April 1998 - Mar 1999

Associate Professor

Department of Precision Engineering

Graduate School of Engineering, The University of Tokyo

Research subjects

- Measurement and control of reentrant activities observed in cardiac arrhythmia (ventricular fibrillation)
- Computer Aided Surgery
- Medical Robotics

April 1999 -Nov. 2001

Associate Professor

Institute of Environmental Studies,

Graduate School of Frontier Sciences, The University of Tokyo

Research subjects

- Measurement and control of reentrant activities observed in cardiac arrhythmia (ventricular fibrillation)
- Computer Aided Surgery
- Medical Robotics

Nov. 2001 - Mar. 2006

Professor

Institute of Environmental Studies,

Graduate School of Frontier Sciences, The University of Tokyo

Research subjects

- Measurement and control of reentrant activities observed in cardiac arrhythmia (ventricular fibrillation)
- Computer Aided Surgery
- Medical Robotics

April 2006 – date

Professor

Department of Precision Engineering,

Department of Bioengineering

School of Engineering, The University of Tokyo

Research subjects

- Measurement and control of reentrant activities observed in cardiac arrhythmia (ventricular fibrillation)
- Computer Aided Surgery
- Medical Robotics
- Regulatory Science for Medical Device Development

April 2012 – date

Professor

Director (April 2012-March 2017)

Medical Device Development and Regulation Research Center

School of Engineering, The University of Tokyo

Research subjects

- Regulatory Science for Medical Device Development

June 2012 – May 2017

Deputy Director for Medical Devices,

Center for Product Evaluation

Pharmaceuticals and Medical Devices Agency (PMDA)

April 2014 – March 2017

Vice dean, School of Engineering, The University of Tokyo

Director, Institute of Innovation in International Engineering Education,

School of Engineering, The University of Tokyo

June 2017 – March 2019

Special Advisor to the Chief of Executive
Pharmaceuticals and Medical Devices Agency (PMDA)
October 2017 to date
Director
Research Institute for Biomedical Science and Engineering, The University of
Tokyo

HONORS AND AWARDS

- 1982 Hatakeyama Award
from Japan Society of Mechanical Engineers
- 1994 Young Investigator Travel Award International Society for
Rotary Blood Pump
- 2006 Fellow, The Japan Society of Mechanical Engineers
- 2006 The Japan Society of Mechanical Engineers Funai Award
- 2006 The Japan Society of Computer Aided Surgery, Best Paper
Award
- 2010 Robotic Society of Japan, Best Paper Award
- 2014 Selected as Optics in 2014 one of the most exciting peer-
reviewed optics research to have emerged over the past 12
months. (Ultrafast Optics Collecting video at a trillion frames
per second) by Photonics and Optics News (OSA)
- 2015 Robotic Society of Japan, Best Paper Award
- 2015 Robotic Society of Japan, Fellow
- 2016 Fellow, International Academy of Medical and Biological
Engineering (IAMBE) (affiliated with International
Federation for Medical and Biological Engineering)
- 2018 Best Paper Award, Japanese Society for Medical and
Biological Engineering
- 2022 Wiley Top Cited Article 2020-2021, The International Journal
of Medical Robotics and Computer Assisted Surgery

MEMBERSHIP OF ACADEMIC SOCIETIES

International Society for Artificial Organs, International Society for
Computer Aided Surgery, IEEE, International Society for Rotary Blood
Pump, Japan Society of Mechanical Engineers, The Japan Society for
Precision Engineering, Japanese Society for Artificial Organs, Japanese

Society for Medical & Biological Engineering, Society of Lifecycle Support Technology, Japan Society of Computer Aided Surgery, Japanese Society of Medical Instrumentation, Japanese Circulation Society, Japanese Society of Electrocardiology, etc.

President, Japanese Society for Medical and Biological Engineering (from June 2014 to June 2016)

Chair of Asian Pacific Working Group of International Federation for Medical and Biological Engineering (2009-date)

Regional representative from Asian Pacific region to Administrative Council of the IFMBE (2018-date)

RESEARCH PROJECTS CURRENTLY ENGAGED

Principle Investigator

2021FY – 2023FY Project/Area Number: 21H04953 (Grants-in- Aid for Scientific Research)

Multidimensional treatment strategies for chronic atrial fibrillation by integrating phase variance analysis and visualization of arrhythmias

Member of the projects

2020FY – 2024FY Project/Area Number: 20H04553 (Grants-in- Aid for Scientific Research)

Research on catheter navigation system with integrated ultra-small magnetic sensor

Sub-project leader

2019 FY – 2024FY Japan Agency for Medical Research and Development, Digital

Transformation of Surgery: Development of Information-Assisted Endoscopic Surgery System

RESERCH

1) Computer Aided Surgery

Utilization of pre- and intra- operative multi-dimensional dimensional biomedical image data (such as those obtained by X-ray CT, MRI. Ultrasound imaging and endoscope) to guide and identify the target lesion to optimize the quality of therapeutic outcome and to minimize invasiveness of the therapy is investigated.

The research topics include surgical navigation, image guided navigation, and intraoperative biomedical monitoring.

2) Medical Robotics and medical devise for minimally invasive therapy

Medical devices for realization of advanced minimally invasive intervention are investigated. Research topics includes master-slave surgical manipulator for minimally

invasive surgery, image and information guided control of surgical robotics, robotic manipulation of focused energy application devices such as high intensity focused ultrasound, and advanced therapeutic device such as shock wave device.

3) Visualization and analysis of arrhythmogenic phenomena

Optical mapping of electrical activities and Ca dynamics in perfused rabbit heart is investigated. The novel imaging system to visualize these phenomena in high spatio-temporal resolution using voltage sensitive dye, Ca indicator, and a high speed camera. Methods for image analysis to extract basic information to understand the mechanism of arrhythmogenic activities are studied. Control of reentrant activities by weak electric shock is also investigated by applying these visualization technologies.

4) Regulatory sciences for medical device development

Development of objective evaluation methods for novel medical devices is conducted. The aim of the research is to provide scientific basis for risk management of novel medical devices.

Dr. Sakuma has contributed significant biomedical research to the field of computer aided surgery, medical robotics, assist circulation, medical instrumentation and studies on arrhythmia. His main interests are computer aided surgery, biomedical instrumentation, therapeutic engineering. He was one of the first researchers who proposed a pivot bearing supported centrifugal blood pump (Sakuma et al: Heart Replacement, Artificial Heart 4, 301-303, Springer, 1993, Ohara Y., Sakuma I. et al: Artif Organs, 17:599-604, 1993). He also investigated effects of high intensity Electric shock on electrophysiological properties on cardiac myocyte through both experimental and computer simulation approaches. (Kodama I, Sakuma I et al: Am J Physiol., - Heart and Circulatory Physiology, 267:H248, 1994, Sakuma I. et al: IEEE Trans. BME, 45:258, 1998, Ohuchi K., Sakuma I. et al: IEEE Trans. BME, 49:18, 2002). He firstly applied high intensity blue light emitting diode illumination to optical mapping technologies for membrane action potential measurement of a rabbit heart and has been applying the method in basic arrhythmia studies (Sakuma I et al.: PACE, 22: 702, 1999, Yamazaki M, Sakuma I et al: Am J Physiol., - Heart and Circulatory Physiology, 292:H539, 2007) He also conducted extensive research on surgical robotics. He contributed in development of a surgical robot firstly commercialized in Japan (Kobayashi E., Sakuma I et al.; Computer Aided Surgery, 4: 182, 1999, Tanoue K, Sakuma I. et al: Surgical Endoscopy, 20:753, 2006). He also conducted fusion of biomedical instrumentation and medical robotics (Noguchi M, Sakuma I et al: MICCAI 2006, 543, 2006, Liao H, Sakuma I: Med Image Analysis, 16:754, 2012). He involved in developing a world fastest imaging system (4.4 trillion frames per second with pixel resolution with 450×450 pixels) potentially

applicable to biomedical research (Nakagawa K., Sakuma I et al: nature Photonics, He has published 150 English reviewed articles and 65 Japanese articles in peer-reviewed journals. His h-index is 40 (Google Scholar).

TEACHING

He has performed outstanding service as a teacher of biomedical Engineering. He wrote chapters of textbooks in biomedical instrumentation and bio-mechanical engineering in Japanese and a chapter of "Optical Navigation", in Intraoperative Imaging and Image-Guided Therapy (pp581-590,Spinger, 2014) . He edited write chapters of "Handbook for Medical Engineering" in 2022. He has been actively involved in education throughout his career, both his appointment at Tokyo Denki University and The University of Tokyo where he has been active in improving graduate education in bioengineering. He has educated more than 30 PhD students and 30 ME students.

SOCIETAL CONTRIBUTUION

Dr, Sakuma has certainly given significant service to organized biomedical engineering at both the international and local level. In regards to national organization, he has served as President of Japanese Society of Medical and Biological Engineering from FY 2014 to FY 2015. He is also vice president of Japanese Society of Computer aided Surgery. He serves as the chairman of Japanese national Committee of IEC TC62. He served as vice president of Robotic Society of Japan from 2009 to 2011. At the international level, he has been actively involved in the International Federation of Medical and Biological Engineering (IFMBE), He has been serving as the chair of Asian Pacific Working Group of IFMBE since 2010 and a bord member of International Society for Computer Aided Surgery. He is the editorial Board of IEEE Transaction on Biomedical Engineering AND international Journal of Computer Assisted Radiology and Surgery.

PUBLICATIONS (Peer reviewed English Papers)

- 1) Gakuto Aoyama, Longfei Zhao, Shun Zhao, Xiao Xue, Yunxin Zhong, Haruo Yamauchi, Hiroyuki Tsukihara, Eriko Maeda, Kenji Ino, Naoki Tomii, Shu Takagi, Ichiro Sakuma, Minoru Ono, Takuya Sakaguchi. Automatic Aortic Valve Cusps Segmentation from CT Images Based on the Cascading Multiple Deep Neural Networks, *Journal of Imaging* 8(1), 11(2022)
- 2) Masatoshi Yamazaki, Naoki Tomii, Koichi Tsuneyama, Hiroki Takanari, Ryoko Niwa, Haruo Honjo, Itsuo Kodama, Tatsuhiko Arafune, Naomasa Makita, Ichiro Sakuma, Dobromir Dobrev, Stanley Nattel, and Yukiomi Tsuji. Rotors anchored by refractory islands drive torsades de pointes in an experimental model of electrical storm. *Heart Rhythm* 19(2), 318-329(2022)
- 3) Masatoshi Yamazaki, Naoki Tomii, Koichi Tsuneyama, Hiroki Takanari, Ryoko Niwa, Haruo Honjo, Itsuo Kodama, Tatsuhiko Arafune, Naomasa Makita, Ichiro Sakuma, Dobromir Dobrev, Stanley Nattel, and Yukiomi Tsuji. Rotors anchored by refractory islands drive torsades de pointes in an experimental model of electrical storm. *Heart Rhythm* 19(2), 318-329(2022)
- 4) Q. Ma, E. Kobayashi, B. Fan, K. Hara, K. Nakagawa, K. Masamune, I. Sakuma and H. Suenaga, "Machine-learning-based approach for predicting postoperative skeletal changes for orthognathic surgical planning." *Journal of Medical Robotics and Computer Assisted Surgery*, Published Online.
<https://doi.org/10.1002/rcs.2379>
- 5) Hiroshi Seno, Masatoshi Yamazaki, Nituro Shibata, Ichiro Sakuma, and Naoki Tomii. In-Silico Deep Reinforcement Learning for Effective Cardiac Ablation Strategy. *Journal of Medical and Biological Engineering* 41(6), 935-965 (2021).
- 6) Iwahashi, T.; Tang, T.; Matsui, K.; Fujiwara, K.; Itani, K.; Yoshinaka, K.; Azuma, T.; Takagi, S.; Sakuma, I., Simulation of control of heat flux with 2D traversable sonication path in high-intensity focused ultrasound treatment. *Japanese Journal of Applied Physics* 2021, 60 (12), 126503.
- 7) Kurato Tokunaga, Kensuke Nakamura, Ryota Inokuchi, Naoki Hayase, Rui Terada, Yuji Tomioka, Toshiyuki Ikeda, Etsuko Kobayashi, Hitoshi Okazaki, Ichiro Sakuma, Kent Doi, Naoto Morimura, CARDIAC VARIATION OF INTERNAL JUGULAR VEIN AS A MARKER OF VOLUME CHANGE IN HEMORRHAGIC SHOCK, *SHOCK*, Vol. 54, No. 6, pp. 717–722, 2020
- 8) Junichi Sugita, Katsuhito Fujiu, Yukiteru Nakayama, Takumi Matsubara, Jun Matsuda, Tsukasa Oshima, Yuxiang Liu, Yujin Maru, Eriko Hasumi, Toshiya Kojima, Hiroshi Seno, Keisuke Asano, Ayumu Ishijima, Naoki Tomii, Masatoshi

- Yamazaki, Fujimi Kudo, Ichiro Sakuma, Ryozo Nagai, Ichiro Manabe, Issei Komuro: Cardiac macrophages prevent sudden death during heart stress, NATURE COMMUNICATIONS, 2021, <https://doi.org/10.1038/s41467-021-22178-0>
- 9) Mizuno HL, Anraku Y, Sakuma I and Akagi Y. Design of a Photocleavable Drug Binding Platform for a Novel Remotely Controllable Drug Coated Balloon. *Journal of Drug Delivery Science and Technology*. 2021:102375.
- 1 0) Hidemichi Kiyomatsu, Lei Ma, Junchen Wang, Tomomichi Kiyomatsu, Hiroyuki Tsuihara, Etsuko Kobayashi, Ichiro Sakuma, Souichiro Ichihara: Deformation of the Pelvic Arteries Caused by Pneumoperitoneum and Postural Changes in an Animal Model, *in vivo* 35, pp275-281 , doi:10.21873/invivo.12256, 2021
- 1 1) Madhushanka R. Liyanaarachchi, Kenji Shimazoe, Hiroyuki Takahashi, Keiichi Nakagawa, Etsuko Kobayashi, Ichiro Sakuma: Development and evaluation of a prototype detector for an intraoperative laparoscopic coincidence imaging system with PET tracers, *International Journal of Computer Assisted Radiology and Surgery* 16, pp29–39, <https://doi.org/10.1007/s11548-020-02282-0>, 2021
- 1 2) Naoki Tomii, Masatoshi Yamazaki, Takashi Ashihara, Kazuo Nakazawa, Nitaro Shibata, Haruo Honjo, Ichiro Sakuma: Spatial Phase Discontinuity at the Center of Moving Cardiac Spiral Waves, *Computers in Biology and Medicine* 130, <https://doi.org/10.1016/j.combiomed.2021.104217>, 2021
- 1 3) Ma Q, Kobayashi E, Suenaga H, Hara K, Wang J, Nakagawa K, Sakuma I and Masamune K. Autonomous Surgical Robot With Camera-Based Markerless Navigation for Oral and Maxillofacial Surgery. *IEEE/ASME Transactions on Mechatronics*. 2020;25:1084-1094.
- 1 4) Ma Q, Kobayashi E, Fan B, Nakagawa K, Sakuma I, Masamune K and Suenaga H. Automatic 3D landmarking model using patch - based deep neural networks for CT image of oral and maxillofacial surgery. *The International Journal of Medical Robotics and Computer Assisted Surgery*. 2020.
- 1 5) Monden Y, Tsukamoto A, Ushida T, Kobayashi E, Nakagawa K and Sakuma I. An in vitro model of temporal enhancement of epithelium barrier permeability by low-energy shock waves without contrast agents. *Medical & Biological Engineering & Computing*. 2020;58:1987-1993
- 1 6) Lei Ma, Junchen Wang, Hidemichi Kiyomatsu, Hiroyuki Tsukihara, Ichiro Sakuma, Etsuko Kobayashi: Surgical navigation system for laparoscopic lateral pelvic lymph node dissection in rectal cancer surgery using laparoscopic-vision-tracked ultrasonic imaging, *Surgical Endoscopy*, Published Online 13, <https://doi.org/10.1007/s00464-020-08153-8>, 2020

- 1 7) Takumi Noda, Naoki Tomii, Keiichi Nakagawa, Takashi Azuma, Ichiro Sakuma: Shape Estimation Algorithm for Ultrasound Imaging by Flexible Array Transducer, *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control* 67.11, pp2345-2353, 2020
- 1 8) Hayato L Mizuno, Eiki Tan, Yasutaka Anraku, takamasa sakai, Ichiro Sakuma, Yuki Akagi: Relationship between Bulk Physicochemical Properties and Surface Wettability of Hydrogels with Homogeneous Network Structure, *Langmuir* 2020, 36, 20, pp5554–5562
- 1 9) Hiroshi Seno, Naoki Tomii, Masatoshi Yamazaki, Haruo Honjo, Nitaro Shibata, Ichiro Sakuma: Cardiac Spiral Wave Termination by Linear Regional Cooling Toward the Anatomical Boundary of the Heart, *Journal of Medical and Biological Engineering* 40, pp400-408,2020
- 2 0) Saiki T, Hosobata T, Kono Y, Takeda M, Ishijima A, Tamamitsu M, Kitagawa Y, Goda K, Morita S-y, Ozaki S, Motohara K, Yamagata Y, Nakagawa K and Sakuma I. Sequentially timed all-optical mapping photography boosted by a branched 4f system with a slicing mirror. *Optics Express*. 2020;28:31914-31922.
- 2 1) Tokunaga K, Nakamura K, Inokuchi R, Hayase N, Terada R, Tomioka Y, Ikeda T, Kobayashi E, Okazaki H and Sakuma I. Cardiac Variation of Internal Jugular Vein as a Marker of Volume Change in Hemorrhagic Shock. *Shock*. 2020;54:717-722.
- 2 2) Liyanaarachchi M, Shimazoe K, Takahashi H, Kobayashi E, Nakagawa K and Sakuma I. Prototype detector for intraoperative PET-laparoscope system with a multi-layer movable detector. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*. 2020;958:162788.
- 2 3) Shibata N, Inada S, Kazuo, Tomii N, Yamazaki M, Seno H, Honjo H and Sakuma I. Mechanism of Electrical Defibrillation: Current Status and Future Perspective. *Advanced Biomedical Engineering*. 2020;9:125-137.
- 2 4) Tomii N, Asano K, Seno H, Ashihara T, Sakuma I and Yamazaki M. Validation of Intraoperative Catheter Phase Mapping Using a Simultaneous Optical Measurement System in Rabbit Ventricular Myocardium. *Circulation Journal*. 2020;84:609-615.
- 2 5) Qingchuan Ma, Etsuko Kobayashi, Junchen Wang, Kazuaki Hara, Hideyuki Suenaga, Ichiro Sakuma, Ken Masamune: Development and preliminary evaluation of an autonomous surgical system for oral and maxillofacial surgery, *International Journal of Medical Robotics and Computer Assisted Surgery*,

- <https://doi.org/10.1002/rcs.1997>, 2019
- 2 6) Ayumu Ishijima, Satoshi Yamaguchi, Takashi Azuma, Etsuko Kobayashi, Yoshikazu Shibasaki, Teruyuki Nagamune, Ichiro Sakuma: Selective intracellular delivery of perfluorocarbonnanodroplets for cytotoxicity threshold reduction on ultra-sound - induced vaporization, *Cancer Reports* 2019;e1165, <https://doi.org/10.1002/cnr2.1165>, 2019
- 2 7) Izumu Hosoi, Etsuko Kobayashi, Song Ho Chang, Takumi Matsumoto, Qi An, Emi Anzai, Yuji Ohta, Ichiro Sakuma: Development of intraoperative plantar pressure measuring system considering weight bearing axis, *International Journal of Computer Assisted Radiology and Surgery*, 14:385–395, 2019
- 2 8) L. Ma, H. Kiyomatsu, K. Nakagawa, J. Wang, E. Kobayashi, I. Sakuma: Accurate vessel segmentation in ultrasound images using a local-phase-based snake, *Biomedical Signal Processing and Control* Vol.43: pp.236-243, 2018.
- 2 9) Kiyoyuki CHINZEI, Akinobu SHIMIZU, Kensaku MORI, Kanako HARADA, Hideaki TAKEDA, Makoto HASHIZUME, Mayumi ISHIZUKA, Nobumasa KATO, Ryuzo KAWAMORI, Shunei KYO, Kyosuke NAGATA, Takashi YAMANE, Ichiro SAKUMA, Kazuhiko OHE, Mamoru MITSUISHI: Regulatory Science on AI-based Medical Devices and Systems, *Advanced Biomedical Engineering* 7, pp118–123, 2018. DOI:10.14326/abe.7.118
- 3 0) Naoki Tomii, Masatoshi Yamazaki, Tatsuhiko Arafune, Kaichiro Kamiya, Kazuo Nakazawa, Haruo Honjo, Nitaro Shibata, Ichiro Sakuma: Interaction of phase singularities on spiral wave tail: reconsideration of capturing excitable gap, *American Journal of Physiology-Heart and Circulatory Physiology*, 315, pp318-326, 2018
- 3 1) Tang, T.; Azuma, T.; Iwahashi, T.; Takeuchi, H.; Kobayashi, E.; Sakuma, I., A high-precision US-guided robot-assisted HIFU treatment system for breast cancer. *Engineering* 2018, 4 (5), 702-713.
- 3 2) Iwahashi, T.; Tang, T.; Matsui, K.; Fujiwara, K.; Itani, K.; Yoshinaka, K.; Azuma, T.; Takagi, S.; Sakuma, I., Visualization of Temperature Distribution around Focal Area and Near Fields of High Intensity Focused Ultrasound Using a 3D Measurement System. *Advanced Biomedical Engineering* 2018, 7, 1-7
- 3 3) Ogawa T, Honjo H, Yamazaki M, Kushiya Y, Sakuma I, Kodama I, Kamiya K: Ranolazine facilitates termination of ventricular tachyarrhythmia associated with acute myocardial ischemia through suppression of late Ina mediated focal activity, *Circ J* 2017;81(10):1411-1428
- 3 4) Takumi Harada, Naoki Tomii, Shota Manago, Etsuko Kobayashi, Ichiro Sakuma:

- Simulation study on compressive laminar optical tomography for cardiac action potential propagation, *Biomed Opt Express* 8(4):pp2339-2358, 2017
- 3 5) Ishijima, K. Minamihata, S. Yamaguchi, S. Yamahira, R. Ichikawa, E. Kobayashi, M. Iijima, Y. Shibasaki, T. Azuma, T. Nagamune, I. Sakuma : Selective intracellular vaporisation of antibody-conjugated phasechange nano-droplets in vitro, *Scientific Reports* 7, Article number:44077, DOI: 10.1038/srep44077, 2017
- 3 6) Xiaolei Qu¹, Takashi Azuma, Hongxiang Lin, Hirofumi Nakamura, Satoshi Tamano, Shu Takagi, Shin-ichiro Umemura, Ichiro Sakuma and Yoichiro Matsumoto : Computational cost reduction by avoiding ray-linking iteration in bent-ray method for sound speed image reconstruction in ultrasound computed tomography, *Japanese Journal of Applied Physics*, Volume 56, Number 7S1, <https://doi.org/10.7567/JJAP.56.07JF14>, 2017
- 3 7) Takeharu Asano, Naoto Kubota, Norihiro Koizumi, Kazunori Itani, Tsuyoshi Mitake, Kazuhito Yuhashi, Hongen Liao, Mamoru Mitsuishi, Shigemi Takeishi, Toshiaki Takahashi, Shin Ohnishi, Shiro Sasaki, Ichiro Sakuma, Takashi Kadowaki: Novel and Simple Ultrasonographic Methods for Estimating the Abdominal Visceral Fat Area, *International Journal of Endocrinology*, Hindawi International Journal of Endocrinology, Volume 2017, Article ID 8796069, 12 pages, <https://doi.org/10.1155/2017/8796069>
- 3 8) Shin Sen, Kanako Harada, Zackary Hewitt, Etsuko Kobayashi, Ichiro Sakuma : Concept design of robotic modules for needlescopic surgery, *Minimally Invasive Therapy & Allined Technologies*, Vol.26 No.4, pp232-239, 2017 <http://dx.doi.org/10.1080/13645706.2017.1288634>, 2017
- 3 9) Kazuhiro Matsui, Takashi Azuma, Keisuke Fujiwara, Hideki Takeuchi, Kazunori Itani, Junchen Wang, Toshihide Iwahashi, Etsuko Kobayashi, and Ichiro Sakuma: Improving high-intensity focused ultrasound beam imaging via a backscattering suppression algorithm, *Japanese Journal of Applied Physics* 56, pp 057301-1~057301-10, 2017
- 4 0) Junchen Wang, Hideyuki Suenaga, Liangjing Yang, Etsuko Kobayashi, Ichiro Sakuma: Video See-Through Augmented Reality for Oral and Maxillofacial Surgery, *International Journal of Medical Robotics and Computer Assisted Surgery* 2017, 13, e1754, 2017
- 4 1) Ayumu Ishijima, Jun Tanaka, Takashi Azuma, Kosuke Minamihata, Satoshi Yamaguchi, Etsuko Kobayashi, Teruyuki Nagamune, Ichiro Sakuma: The lifetime evaluation of vapourised phase-change nano-droplets, *Ultrasonics* 69 (2016) ,pp97

- 105, doi:10.1016/j.ultras.2016.04.002

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- 4 2) Naoki Tomii, Masatoshi Yamazaki, Tatsuhiko Arafune, Haruo Honjo, Nitaro Shibata, Ichiro Sakuma: Detection Algorithm of Phase Singularity Using Phase Variance Analysis for Epicardial Optical Mapping Data., IEEE Transactions on Biomedical Engineering, Vol. 63, No. 9, pp1795-1803, Sep. 2016
- 4 3) Liangjing Yang, Junchen Wang, Takehiro Ando, Akihiro Kubota, Hiromasa Yamashita, Ichiro Sakuma, Toshio Chiba, and Etsuko Kobayashi. "Self-contained image mapping of placental vasculature in 3D ultrasound-guided fetoscopy." Surgical Endoscopy, pp4136-4149 (2015) DOI: 10.1007/s00464-015-4690-z
- 4 4) Liangjing Yang, Junchen Wang, Takehiro Ando, Akihiro Kubota, Hiromasa Yamashita, Ichiro Sakuma, Toshio Chiba, Etsuko Kobayashi : Towards scene adaptive image correspondence for placental vasculature mosaic in computer assisted fetoscopic procedures, The International Journal of Medical Robotics and Computer Assisted Surgery 2016, 12, pp375-386, 2016
- 4 5) Junchen Wang, Etsuko Kobayashi, Ichiro Sakuma, Coarse-to-fine dot array marker detection with accurate edge localization for stereo visual tracking, Biomedical Signal Processing and Control, Volume 15, January 2015, Pages 49–59, 2015 doi:10.1016/j.bspc.2014.09.008
- 4 6) L. Yang, J. Wang, T. Ando, H. Yamashita, I. Sakuma, T. Chiba, E. Kobayashi, Vision-based endoscope tracking for 3D ultrasound image-guided surgical navigation, Computerized Medical Imaging and Graphics, Volume 40, , Pages 205–216, 2014
- 4 7) T. Suzuki, F. Isa, L. Fujii, K. Hirosawa, K. Nakagawa, K. Goda, I. Sakuma, and F. Kannari, "Sequentially timed all-optical mapping photography (STAMP) utilizing spectral filtering," Optics Express, vol. 23, pp. 30512-30522, 2015.
- 4 8) T. Zhou, T. Ando, K. Nakagawa, H. Liao, E. Kobayashi and I. Sakuma, "Localizing fluorophore (centroid) inside a scattering medium by depth perturbation" Journal of Biomedical Optics 20: 017003 (2015).
- 4 9) R. Tachikawa, A. Tsukamoto, Y. Monden, K. Nakagawa, T. Ando, E. Kobayashi, T. Ushida and I. Sakuma, "Development of Cavitation Bubble Observation System and Application to Study Expansion Waves and Shock Waves." Advanced Biomedical Engineering 4: 96-104, (2015)
- 5 0) Xiaolei Qu, Takashi Azuma, Haruka Imoto, Riaz Raufy, Hongxiang Lin, Hirofumi Nakamura, Satoshi Tamano, Shu Takagi, Shin-ichiro Umemura, Ichiro Sakuma: Novel automatic first-arrival picking method for ultrasound sound-speed

- tomography, *Jpn. J. Appl. Phys.* 54 07HF10, 2015
- 5 1) M. Tamamitsu, K. Nakagawa, R. Horisaki, A. Iwasaki, Y. Oishi, A. Tsukamoto, F. Kannari, I. Sakuma, and K. Goda, "Design for sequentially timed all-optical mapping photography with optimum temporal performance," *Optics letters*, vol. 40, pp. 633-636, 2015.
 - 5 2) Ignacio Hernandez, Tatsuhiko Arafune, Nitaro Shibata, Masatoshi Yamazaki, Haruo Honjo, Ichiro Sakuma: Optical Mapping with a Precise Image Registration to Observe Late Phase 3 EAD, *Journal of Medical and Bioengineering*, Vol.4 No.1 Feb., pp40-46, 2015, DOI:10.12720/jomb.4.1.40-46
 - 5 3) Kazuki Hashimoto, Hikaru Mizuno, Keiichi Nakagawa, Ryoichi Horisaki, Atsushi Iwasaki, Fumihiko Kannari, Ichiro Sakuma, Keisuke Goda: High-speed multispectral videography with a periscope array in a spectral shaper, *OPTICS LETTERS* Vol. 39, No. 24, pp6942-6945, December 15, 2014
 - 5 4) K. Nakagawa, A. Iwasaki, Y. Oishi, R. Horisaki, A. Tsukamoto, A. Nakamura, K. Hirosawa, H. Liao, T. Ushida, K. Goda, F. Kannari, I. Sakuma: Sequentially timed all-optical mapping photography (STAMP), *NATURE PHOTONICS* VOL 8, pp695-700, 2014
 - 5 5) T.Kato, T.Arafune, T.Washio, A.Nakagawa, Y.Ogawa, T.Tominaga, I. Sakuma, E. Kobayashi: Mechanics of the injected pulsejet into gelatin gel and evaluation of the effect by puncture and crack generation and growth, *JOURNAL OF APPLIED PHYSICS* 116(7), pp:074901, 2014
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