

Naoji Matsuhisa

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PERSON

- Associate Professor at Institute of Industrial Science, The University of Tokyo, Japan
- Ph.D. (Engineering)
(March/23/2017, Electrical Engineering and Information Science, School of Engineering, The University of Tokyo)
- Nationality: Japanese
- Address: 4-6-1 Komaba, Meguro-ku, Tokyo 153-8505, Japan.
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RESEARCH INTERESTS

- Stretchable/Flexible electronics
- Printed electronics
- Organic semiconductors and the optoelectronic devices (OFET, OPV, OLED)
- Healthcare sensors

EDUCATION

The University of Tokyo Advisor: Prof. Takao Someya Doctor of Philosophy, Electrical Engineering	<i>April 2014 – March 2017</i>
The University of Tokyo Advisor: Prof. Takao Someya Master, Electrical Engineering	<i>April 2012 – March 2014</i>
The University of Tokyo Bachelor, Electrical Engineering	<i>April 2008 – March 2012</i>

PROFESSIONAL EXPERIENCE

Institute of Industrial Science, the University of Tokyo, Japan Associate Professor (PI, tenured)	<i>April 2022 –</i>
Department of Electronics and Electronic Engineering, Keio University, Japan Visiting Associate Professor (Concurrent)	<i>April 2022 –</i>
Japan Science and Technology Agency, Japan PRESTO researcher (Concurrent)	<i>December 2020 –</i>
Department of Electronics and Electronic Engineering, Keio University, Japan Assistant Professor (PI, tenured)	<i>April 2020 – March 2022</i>
Department of Chemical Engineering, Stanford University, U.S.A. Postdoctoral Scholar <i>Topic:</i> Development of stretchable semiconductor devices <i>Advisor:</i> Prof. Zhenan Bao, Department of Chemical Engineering	<i>April 2019 – March 2020</i>
Japan Society for the Promotion of Science Overseas Research Fellowships Japan Society for the Promotion of Science, Japan <i>Topic:</i> Development of stretchable semiconductor devices <i>Advisor:</i> Prof. Zhenan Bao, Stanford University	<i>April 2019 – March 2020</i>
Department of Chemical Engineering, Stanford University, U.S.A. Visiting Scholar <i>Topic:</i> Development of stretchable electronic devices <i>Advisor:</i> Prof. Zhenan Bao, Department of Chemical Engineering	<i>August 2017 – March 2019</i>

School of Materials Science & Engineering
Nanyang Technological University, Singapore

May 2017 – March 2019

Research Fellow

Topic: Development of stretchable electronic devices

Advisor: Prof. Xiaodong Chen, School of Materials Science & Engineering

Department of Electrical Engineering and Information Systems
The University of Tokyo, Japan

April 2017 – May 2017

Researcher

Topic: Development of stretchable sensors

Advisor: Prof. Takao Someya, Department of Electrical Engineering and Information Systems

Research Fellowships for Young Scientists (DC2)

April 2016 – March 2017

Japan Society for the Promotion of Science, Japan

Topic: Development of stretchable optical sensors

Advisor: Prof. Takao Someya, The University of Tokyo

Advanced Leading Graduate Course for Photon Science (ALPS)

October 2012 – March 2017

The University of Tokyo, Japan

Topic: Development of stretchable optical sensors

Advisor: Prof. Takao Someya, Department of Electrical Engineering and Information Systems,
& Prof. Akihiko Nakano, Department of Biological Sciences

Department of Electrical Engineering and Information Systems
The University of Tokyo, Japan

April 2011 – March 2017

Research Assistant

Bioharmonized Electronics, Exploratory Research for Advanced Technology (ERATO)

Topic: Development of stretchable conductive inks

Advisor: Prof. Takao Someya, Department of Electrical Engineering and Information Systems

Department of Electrical Engineering

December 2014

Princeton University, USA

Visiting Researcher

Topic: Organic/Inorganic hybrid phototransistors

Advisor: Prof. James C. Sturm, Prof. Naveen Verma, Prof. Sigurd Wagner, Department of
Electrical Engineering

Renesas Solutions

August 2010

Internship

Topic: USB communication protocol

PUBLICATIONS (PEER-REVIEWED)

(Google scholar: <https://scholar.google.co.jp/citations?user=T-7aDjwAAAAJ&hl=ja>)

1. J. Kang, J. Mun, Y. Zheng, M. Koizumi, N. Matsuhisa, H.-C. Wu, S. Chen, J. B.-H. Tok, G. H. Lee, L. Jin*, Z. Bao* "Tough-interface-enabled stretchable electronics using non-stretchable polymer semiconductors and conductors" *Nature Nanotechnology* (2022).
2. Y. Kim, C. Zhu, W.-Y. Lee, A. Smith, H. Ma, X. Li, D. Son, N. Matsuhisa, J. Kim, W.-G. Bae, S. H. Cho, M.-G. Kim, T. Kurosawa, T. Katsumata, J. W.F. To, J. Y. Oh, S. Paik, S. J. Kim, L. Jin, F. Yan, J. B.-H. Tok, Z. Bao* "A Hemispherical Image Sensor Array Fabricated with Organic Photo-memory Transistors" *Advanced Materials* (2022).
3. T. Shimura, S. Sato, P. Zalar*, N. Matsuhisa* "Engineering the Comfort-of-Wear for Next Generation Wearables" *Advanced Electronic Materials*, 2200512 (2022).
4. A. Abramson, C. T. Chan, Y. Khan, A. Mermin-Bunnell, N. Matsuhisa, R. Fong, R. Shad, W. Hiesinger, P. Mallick, S. S. Gambhir, Z. Bao* "A flexible electronic strain sensor for the real-time monitoring of tumor regression" *Science Advances* **8**, eabn6550 (2022).
5. T.-W. Chang, Y.-S. Li, N. Matsuhisa, C.-C. Shih, *Journal of Materials Chemistry C*, Advance Article (2022).
6. (†Same contribution) Z. Zhang†, W. Wang†, Y. Jiang†, Y.-X. Wang†, Y. Wu, J.-C. Lai, S. Niu, C. Xu, C.-C. Shih, C. Wang, H. Yan, L. Galuska, N. Prine, H.-C. Wu, D. Zhong, G. Chen, N. Matsuhisa, Y. Zheng, Z. Yu, Y. Wang, R. Dauskardt, X. Gu, J. B.-H. Tok, Z. Bao* "High-brightness all-polymer stretchable LED with charge-trapping dilution" *Nature* **603**, 624-630 (2022).
7. (†Same contribution) N. Matsuhisa†, S. Niu†, S. J. K. O'Neill, J. Kang, Y. Ochiai, T. Katsumata, H.-C. Wu, M. Ashizawa, G.-J. N. Wang, D. Zhong, X. Wang, X. Gong, R. Ning, H. Gong, I. You, Y. Zheng, Z. Zhang, J. B.-H. Tok, X. Chen, Z. Bao* "High-frequency and intrinsically stretchable polymer diodes" *Nature* **600**, 246-252 (2021).

8. (†Same contribution) J. Mun†, Y. Ochiai†, W. Wang, Y. Zheng, Y.-Q. Zheng, H.-C. Wu, **N. Matsuhisa**, T. Higashihara, J. B.-H. Tok, Y. Yun, Z. Bao* “A design strategy for high mobility stretchable polymer semiconductors” *Nature Communications* **12**, 3572 (2021).
9. (†Same contribution) W. Wang†, S. Wang†*, R. Rastak, Y. Ochiai, S. Niu, Y. Jiang, P. K. Arunachala, Y. Zheng, J. Xu, **N. Matsuhisa**, X. Yan, S.-K. Kwon, M. Miyakawa, Z. Zhang, R. Ning, A. M. Foudeh, Y. Yun, C. Linder, J. B.-H. Tok, Z. Bao* “Strain-insensitive intrinsically stretchable transistors and circuits” *Nature Electronics* **4**, 143-150 (2021).
10. W. Li, **N. Matsuhisa**, Z. Liu, M. Wang, Y. Luo, P. Cai, G. Chen, F. Zhang, C. Li, Z. Liu, Z. Lv, W. Zhang, X. Chen* “An on-demand plant-based actuator created using conformable electrodes” *Nature Electronics* **4**, 134-142 (2021).
11. H.-C. Wu, F. Lissel, G.-J. N. Wang, D. M. Koshy, S. Nikzad, H. Yan, J. Xu, S. Luo, **N. Matsuhisa**, Y. Cheng, F. Wang, B. Ji, D. Li, W.-C. Chen, G. Xue, Z. Bao* “Metal-Ligand Based Mechanophores Enhance Both Mechanical Robustness and Electronic Performance of Polymer Semiconductors” *Advanced Functional Materials* **31**, 20009201 (2021).
12. I. You, D. Mackanic, **N. Matsuhisa**, J. Kang, J. Kwon, L. Beker, J. Mun, W. Suh, T. Y. Kim, J. B.-H. Tok, Z. Bao*, U. Jeong* “Artificial multimodal receptors based on ion relaxation dynamics” *Science* **370**, 961-965 (2020).
13. C. Wan, P. Cai, X. Guo, M. Wang, **N. Matsuhisa**, L. Yang, Z. Lv, Y. Luo, X. J. Loh, X. Chen*, “An artificial sensory neuron with visual-haptic fusion” *Nature Communications* **11**, 4602 (2020).
14. (†Same contribution) S. J.K. O’Neill†, H. Gong†, **N. Matsuhisa**†, S. Chen†, H. Moon, H.-C. Wu, X. Chen, X. Chen, Z. Bao*, “A Carbon-Flower Based Flexible Pressure Sensor Made from Large Area Coating” *Advanced Materials Interfaces* **7**, 2000875 (2020).
15. P. Cai, C. Wan, L. Pan, **N. Matsuhisa**, K. He, Z. Cui, W. Zhang, C. Li, J. Wang, J. Yu, M. Wang, Y. Jiang, G. Chen, X. Chen*, “Locally coupled electromechanical interfaces based on cytoadhesion-inspired hybrids to identify muscular excitation-contraction signatures” *Nature Communications* **11**, 2183 (2020).
16. L. Beker, **N. Matsuhisa**, I. You, S. R. A. Ruth, S. Niu, A. Foudeh, J. B.-H. Tok, X. Chen, Z. Bao*, “A bioinspired stretchable membrane-based compliance sensor” *Proceedings of the National Academy of Sciences* **117**, 11314-11320 (2020).
17. M. O. G. Nayeem, S. Lee, H. Jin, **N. Matsuhisa**, H. Jinno, A. Miyamoto, T. Yokota, T. Someya*, “All-nanofiber-based, ultrasensitive, gas-permeable mechanoacoustic sensors for continuous long-term heart monitoring” *Proceedings of the National Academy of Sciences* **117**, 7063-7070 (2020).
18. (†Same contribution) D. G. Mackanic†, Xuzhou Yan†*, Q. Zhang, **N. Matsuhisa**, Z. Yu, Y. Jiang, T. Manika, J. Lopez, H. Yan, K. Liu, X. Chen, Y. Cui*, Z. Bao*, “Decoupling of Mechanical Properties and Ionic Conductivity in Supramolecular Lithium Ion Conductors” *Nature Communications* **10**, 1-11 (2019).
19. J. Mun, J. Kang, Y. Zheng, S. Luo, H.-C. Wu, **N. Matsuhisa**, J. Xu, G.-J. N. Wang, Y. Yun, G. Xue, J. B.-H. Tok and Z. Bao* “Conjugated Carbon Cyclic Nanoring as Additives for Intrinsically Stretchable Semiconducting Polymers” *Advanced Materials* **31**, 1903912 (2019).
20. (†Same contribution) S. Niu†, **N. Matsuhisa**†, L. Beker, J. Li, S. Wang, J. Wang, Y. Jiang, X. Yan, Y. Yun, W. Burnett, A. S. Y. Poon, J. B.-H. Tok, X. Chen*, Z. Bao*, “A wireless body area sensor network based on stretchable passive tags” *Nature Electronics* **2**, 361-368 (2019).
21. H. Jin, M. O. G. Nayeem, S. Lee, **N. Matsuhisa**, D. Inoue, T. Yokota, D. Hashizume, T. Someya, “Highly Durable Nanofiber-Reinforced Elastic Conductors for Skin-Tight Electronic Textiles” *ACS nano* **13**, 7905-7912 (2019).
22. **N. Matsuhisa**, Y. Jiang, Z. Liu, G. Chen, C. Wan, Y. Kim, J. Kang, H. Tran, H.-C. Wu, I. You, Z. Bao*, X. Chen*, “High-transconductance stretchable transistors achieved by controlled gold microcrack morphology” *Advanced Electronic Materials* **5**, 1900347 (2019).
23. S. R. A. Ruth, L. Beker, H. Tran, V. R. Feig, **N. Matsuhisa**, Z. Bao*, “Rational Design of Capacitive Pressure Sensors Based on Pyramidal Microstructures for Specialized Monitoring of Biosignals” *Advanced Functional Materials*, 1903100 (2019).
24. **N. Matsuhisa***, X. Chen, Z. Bao, T. Someya, “Materials and structural designs of stretchable conductors” *Chemical Society Reviews* **48**, 2946-2966 (2019).
25. J. Kang, D. Son, O. Vardoulis, J. Mun, **N. Matsuhisa**, Y. Kim, J. Kim, J. B.-H. Tok, Z. Bao*, “Modular and Reconfigurable Stretchable Electronic Systems”, *Adv. Mater. Technol.* **4**, 1800417 (2019).
26. P. C.Y. Chow*, **N. Matsuhisa**, P. Zalar, M. Koizumi, T. Yokota, T. Someya*, “Dual-gate organic phototransistor with high-gain and linear photoresponse”, *Nature Communications* **9**, 4546 (2018).
27. D. Son, J. Kang, O. Vardoulis, Y. Kim, **N. Matsuhisa**, J. Y. Oh, J. W.F. To, J. Mun, T. Katsumata, Y. Liu, A. F. McGuire, M. Krasen, F. M.-Lopez, J. Ham, U. Kraft, Y. Lee, Y. Yun, J. B.-H. Tok, Z. Bao, “An integrated self-healable electronic skin system fabricated via dynamic reconstruction of a nanostructured conducting network”, *Nature Nanotechnology* **13**, 1057-1065 (2018).
28. R. Nur, **N. Matsuhisa**, Z. Jiang, M. O. G. Nayeem, T. Yokota, T. Someya*, “A Highly Sensitive Capacitive-type Strain Sensor Using Wrinkled Ultrathin Gold Films”, *Nano Lett.* **18**, 5610-5617 (2018).

29. Y.-L. Wu, **N. Matsuhisa**, P. Zalar, K. Fukuda, T. Yokota, T. Someya*, “Low-Power Monolithically Stacked Organic Photodiode-Blocking Diode Imager by Turn-On Voltage Engineering”, *Adv. Electron. Mater.* **4**, 1800311 (2018).
30. **(Cover Picture)** S. Park, K. Fukuda, M. Wang, C. Lee, T. Yokota, H. Jin, H. Jinno, H. Kimura, P. Zalar, **N. Matsuhisa**, S. Umez, G. C. Bazan, T. Someya*, “Ultraflexible Near-Infrared Organic Photodetectors for Conformal Photoplethysmogram Sensors” *Adv. Mater.* **30**, 1802359 (2018).
31. **(Inside Front Cover)** P. Zalar*, **N. Matsuhisa**, T. Suzuki, S. Enomoto, M. Koizumi, T. Yokota, M. Sekino, T. Someya*, “A Monolithically Processed Rectifying Pixel for High-Resolution Organic Imagers”, *Adv. Electron. Mater.* **4**, 1700601 (2018).
32. C. Wan, G. Chen, Y. Fu, M. Wang, **N. Matsuhisa**, S. Pan, L. Pan, H. Yang, Q. Wan, L. Zhu, X. Chen*, “An Artificial Sensory Neuron with Tactile Perceptual Learning”, *Advanced Materials* **30**, 1801291 (2018).
33. R. Shidachi, **N. Matsuhisa**, P. Zalar, P. C.Y. Chow, H. Jinno; T. Yokota, T. Someya, * “Photocurrent Amplification in Bulk Heterojunction Organic Phototransistors with Different Donor-Acceptor Ratio” *physica status solidi (RRL) - Rapid Research Letters*, 1700400 (2018).
34. G. Chen, **N. Matsuhisa**, Z. Liu, D. Qi, P. Cai, Y. Jiang, C. Wan, Y. Cui, W. R. Leow, Z. Liu, S. Gong, K. Zhang, Y. Cheng, X. Chen*, “Plasticizing Silk Protein for On-Skin Stretchable Electrodes”, *Advanced Materials* **30**, 1800129 (2018).
35. Y. Jiang, Z. Liu, **N. Matsuhisa**, D. Qi, W. R. Leow, H. Yang, J. Yu, G. Chen, Y. Liu, C. Wan, Z. Liu, X. Chen*, “Auxetic Mechanical Metamaterials to Enhance Sensitivity of Stretchable Strain Sensors”, *Advanced Materials* **12**, 1706589 (2018).
36. Y. Jimbo, **N. Matsuhisa**, W. Lee, P. Zalar, H. Jinno, T. Yokota, M. Sekino, T. Someya*, “Ultraflexible Transparent Oxide/Metal/Oxide Stack Electrode with Low Sheet Resistance for Electrophysiological Measurements”, *ACS applied materials & interfaces* **9**, 34744-34750 (2017).
37. W. Lee, D. Kim, **N. Matsuhisa**, M. Nagase, M. Sekino, G. G. Malliaras, T. Yokota, T. Someya*, “Transparent, conformable, active multielectrode array using organic electrochemical transistors”, *Proceedings of the National Academy of Sciences*, 201703886 (2017).
38. A. Miyamoto, S. Lee, N. F. Cooray, S. Lee, M. Mori, **N. Matsuhisa**, H. Jin, L. Yoda, T. Yokota, A. Itoh, M. Sekino, H. Kawasaki, T. Ebihara, M. Amagai, T. Someya, * “Inflammation-free, breathable, lightweight, stretchable on-skin electronics with nanofiber meshes”, *Nature Nanotechnology* **12**, 907 (2017).
39. P. Tantitarntong, P. Zalar, **N. Matsuhisa**, K. Nakano, S. Lee, T. Yokota, K. Tajima, T. Someya*, “High Sensitivity Tuning of Work Function of Self-Assembled Monolayers Modified Electrodes Using Vacuum Ultraviolet Treatment”, *ACS applied materials & interfaces* **9**, 281515-28156 (2017).
40. **N. Matsuhisa**, D. Inoue, P. Zalar, H. Jin, Y. Matsuba, A. Ito, T. Yokota, D. Hashizume, T. Someya*, “Printable Elastic Conductors by in situ Formation of Silver Nanoparticles from Silver Flakes”, *Nature Materials* **16**, 834-840 (2017).
41. H. Jin, **N. Matsuhisa**, S. Lee, M. Abbas, T. Yokota, T. Someya*, “Enhancing the Performance of Stretchable Conductors for E-Textiles by Controlled Ink Permeation”, *Advanced Materials* **29**, 1605848 (2017).
42. H. Jinno, T. Yokota, **N. Matsuhisa**, M. Kaltenbrunner, Y. Tachibana, T. Someya*, “Low operating voltage organic transistors and circuits with anodic titanium oxide and phosphonic acid self-assembled monolayer dielectrics”, *Organic Electronics* **40**, 58-64 (2017).
43. **(Inside Back Cover)** W. Lee, D. Kim, J. Rivnay, **N. Matsuhisa**, T. Lonjaret, T. Yokota, H. Yawo, G. G. Malliaras, T. Someya*, “Integration of Organic Electrochemical and Field-Effect Transistors for Ultraflexible, High Temporal Resolution Electrophysiology Arrays” *Advanced Materials* **28**, 9722-9728 (2016).
44. **(Back Cover)** **N. Matsuhisa**, H. Sakamoto, T. Yokota, P. Zalar, A. Reuveny, S. Lee, T. Someya*, “A Mechanically Durable and Flexible Organic Rectifying Diode with a Polyethylenimine Ethoxylated Cathode” *Advanced Electronic Materials* **2**, 1600259 (2016).
45. S. Lee, A. Reuveny, **N. Matsuhisa**, R. Nawrocki, T. Yokota, T. Someya*, “Enhancement of Closed-Loop Gain of Organic Amplifiers Using Double Gate Structures” *IEEE Electron Device Letters* **37**, 770-773 (2016).
46. T. Yokota*, P. Zalar, M. Kaltenbrunner, H. Jinno, **N. Matsuhisa**, H. Kitanosako, Y. Tachibana, W. Yukita, M. Koizumi, T. Someya*, “Ultraflexible organic photonic skin”, *Science Advances* **2**, e1501856 (2016).
47. R. A. Nawrocki, **N. Matsuhisa**, T. Yokota, T. Someya*, “300-nm Imperceptible, Ultraflexible, and Biocompatible e-Skin Fit with Tactile Sensors and Organic Transistors”, *Advanced Electronic Materials* **2**, 1500452 (2016).
48. P. Prisawong, P. Zalar, A. Reuveny, **N. Matsuhisa**, W. Lee, T. Yokota T. Someya*, “Vacuum Ultraviolet Treatment of Self-Assembled Monolayers: A Tool for Understanding Growth and Tuning Charge Transport in Organic Field-Effect Transistors”, *Advanced Materials* **28**, 2049–2054 (2016).
49. **N. Matsuhisa**, M. Kaltenbrunner, T. Yokota, H. Jinno, K. Kuribara, T. Sekitani, T. Someya*, “Printable elastic conductors with a high conductivity for electronic textile applications”, *Nature Communications* **6**, 7461 (2015).
50. H. Fuketa, K. Yoshioka, Y. Shinozuka, K. Ishida, T. Yokota, **N. Matsuhisa**, Y. Inoue, M. Sekino, T. Sekitani, M. Takamiya, T. Someya, T. Sakurai, “1 μm -Thickness Ultra-flexible and High Electrode-density Surface Electromyogram Measurement

PATENTS

1. Japanese patent 【Open】 Name: Stretchable circuit substrate, Japanese Patent Application No. 2012-031854, Patent 2013-168575, Filing date: 2012/2/16
2. PCT patent 【Applying】 Name: Stretchable conductor, Filing Number : PCT/JP2015/ 53298, Filing date : 2015/2/5
3. Japanese patent 【Applying】 Name: Stretchable devices and its fabrication process, Japanese Patent Application No. 2014-020701, Filing date : 2014/2/5
4. Japanese patent 【Applying】 Name: Stretchable conductor, Japanese Patent Application No. 2016-242459, Filing date : 2016/12/14

INTERNATIONAL PRESENTATIONS

1. (Invited talk) **N. Matsuhisa**, “Stretchable electronic materials and organic optoelectronic devices to form a wearable body sensor network”, *TJ-MOS "分子光电科学" 系列讲座*, online (June 5th, 2020).
2. Y. Jimbo, **N. Matsuhisa**, W. Lee, P. Zalar, H. Jinno, T. Yokota, M. Sekino, and T. Someya, “Low Resistance Transparent Wiring for Ultraflexible Multi Sensor Array”, *Material Research Society Spring Meeting & Exhibit 2018*, SM03.10.06, PCC West, Phoenix, AZ, USA (April 6th, 2018).
3. **N. Matsuhisa**, Z. Liu, Y. Jiang, G. Chen, Z. Bao, and X. Chen, “Highly Stretchable Gold Microcracks Conductors for Stretchable Organic Electrochemical Transistors”, *Material Research Society Spring Meeting & Exhibit 2018*, SM03.10.03, PCC West, Phoenix, AZ, USA (April 6th, 2018).
4. (Invited talk) T. Someya, **N. Matsuhisa**, H. Jin, and T. Yokota, “Printable Elastic Conductors for Smart Apparel and Wearables”, *Material Research Society Spring Meeting & Exhibit 2018*, MA05.02.04, PCC West, Phoenix, AZ, USA (April 3rd, 2018).
5. (Poster) **N. Matsuhisa**, D. Inoue, P. Zalar, H. Jin, Y. Matsuba, A. Itoh, T. Yokota, D. Hashizume, and T. Someya, “Stretchable printed electronic textiles based on high-conductivity printable elastic conductors” *Asilomar Bioelectronics Symposium 2017*, Asilomar Conference Grounds, Pacific Grove, CA, USA (September 17th 2017).
6. (Poster) P. Cai, **N. Matsuhisa**, and X. Chen, “Skin-inspired Patchable Wet Electronics” *Asilomar Bioelectronics Symposium 2017*, Asilomar Conference Grounds, Pacific Grove, CA, USA (September 17th 2017).
7. (Poster) C. Wan, G. Chen, M. Wang, S. Pan, **N. Matsuhisa**, H. Yang, and X. Chen, “Sensory Neuron Inspired Tactile Processing Module” *Asilomar Bioelectronics Symposium 2017*, Asilomar Conference Grounds, Pacific Grove, CA, USA (September 17th 2017).
8. W. Lee, D. Kim, J. Rivnay, **N. Matsuhisa**, T. Lonjaret, T. Yokota, H. Yawo, M. Sekino, G. Malliaras, and T. Someya, “Measuring Evoked Action Potential on Moving Muscle of Optogenetics Rat Using Organic Electro Chemical Transistors”, *Material Research Society Fall Meeting & Exhibit 2016*, BM4.17.04, Hynes Convention Center and Sheraton Boston Hotel, Boston, MA, USA (December 2nd, 2016).
9. (Invited talk) T. Someya, T. Yokota, P. Zalar, M. Kaltenbrunner, H. Jinno, and **N. Matsuhisa**, “Recent Progress of Ultraflexible Organic Photonic and Electronic Skins”, *Material Research Society Fall Meeting & Exhibit 2016*, BM5.2.01, Hynes Convention Center and Sheraton Boston Hotel, Boston, MA, USA (November 29th, 2016).
10. T. Yokota, P. Zalar, M. Kaltenbrunner, H. Jinno, **N. Matsuhisa**, H. Kitanosako, Y. Tachibana, W. Yukita, M. Koizumi, and T. Someya, “Ultra-Flexible Organic Pulse Oximetry”, *Material Research Society Fall Meeting & Exhibit 2016*, BM4.5.04, Hynes Convention Center and Sheraton Boston Hotel, Boston, MA, USA (November 29th, 2016).
11. (Invited talk) T. Someya, **N. Matsuhisa**, H. Jin, and T. Yokota, “Printable Thin-Film and E-Textile Sensors for Health-Monitoring Applications”, *Material Research Society Fall Meeting & Exhibit 2016*, PM5.4.01, Hynes Convention Center and Sheraton Boston Hotel, Boston, MA, USA (November 29th, 2016).
12. R. A. Nawrocki, S. Lee, **N. Matsuhisa**, T. Yokota, and T. Someya, “300-nm High Gain, Multi-stage, Organic CMOS Inverters”, *2016 International Conference on Solid State Devices and Materials (SSDM)*, C000276, Tsukuba International Congress Center, Ibaraki, Japan (September 27th, 2016).
13. P. Zalar, **N. Matsuhisa**, T. Suzuki, S. Enomoto, M. Koizumi, T. Yokota, M. Sekino, and T. Someya, “Organic Photodetector Arrays on 1- μ m Plastic Substrates”, *Organic Semiconductors Conference 2016*, Session 4-2, Hotel Croatia Cavtat, Cavtat, Dubrovnik, Croatia (September 23rd, 2016).

14. R. A. Nawrocki, S. Lee, **N. Matsuhisa**, T. Yokota, and T. Someya, "Ultra-thin, ultra-flexible, ultra-conformable electronics for healthcare and biomedical applications", *European Material Research Society Spring Meeting & Exhibit 2016*, H.5.1, Warsaw University of Technology, Warsaw, Poland (September 21th, 2016).
15. A. Shimada, K. Takashima, **N. Matsuhisa**, P. Zalar, W. Lee, T. Yokota, H. Onodera, and T. Someya, "Biocompatible, Transparent Electrodes for Neural Recording in Optogenetics" *2016 International Conference on Flexible and Printed Electronics (ICFPE)*, Yamagata University, Yamagata, Japan (September 7th, 2016).
16. (Poster) **N. Matsuhisa**, H. Sakamoto, T. Yokota, P. Zalar, A. Reuveny, S. Lee, and T. Someya, "High Current Density, Flexible Organic Diodes for Flexible Sensor Matrices" *2016 International Conference on Flexible and Printed Electronics (ICFPE)*, P9-8, Yamagata University, Yamagata, Japan (September 7th, 2016).
17. Y. Ju, **N. Matsuhisa**, P. Zalar, M. Koizumi, T. Yokota, and T. Someya, "Solution-Processed Organic Rectifier Diodes for a High Resolution Sensor Matrix", *9th International Symposium on Organic Molecular Electronics (ISOME) 2016*, O6-5, Ekinan-Campus "TOKIMATE" Niigata University, Niigata, Japan (May 19th 2016).
18. C. Lee, P. Zalar, **N. Matsuhisa**, J. Huang, K. Tajima, T. Yokota, and T. Someya, "Ultrathin Organic Photodetector Absorbing Near-Infrared Light", *9th International Symposium on Organic Molecular Electronics (ISOME) 2016*, P-28, Ekinan-Campus "TOKIMATE" Niigata University, Niigata, Japan (May 19th 2016).
19. (Invited talk) T. Someya, **N. Matsuhisa**, H. Jin, and T. Yokota, "Recent Progress of Printable Elastic Conductors for E-Textile", *Material Research Society Spring Meeting & Exhibit 2016*, MD6.2.01, PCC West, AZ, USA (March 30th, 2016).
20. R. A. Nawrocki, **N. Matsuhisa**, T. Yokota, and T. Someya, "300-nm, Ultra-Flexible and Skin-Compatible Organic Transistors for Artificial Skin in Medical Applications", *Material Research Society Spring Meeting & Exhibit 2016*, SM3.1.04, PCC West, AZ, USA (March 29th, 2016).
21. R. A. Nawrocki, **N. Matsuhisa**, T. Yokota, and T. Someya, "300-nm Highly Conformable Organic Thin Film Transistor", ITC; International Thin-Film Transistor Conference, Microelectronics and Information System Research Center, National Chiao Tung University, Taiwan (February, 2016).
22. **N. Matsuhisa**, M. Kaltenbrunner, T. Yokota, P. Zalar, T. Sekitani, and T. Someya, "Printable Elastic Conductors with Self-Assembled Conducting Networks for Large-Area Stretchable Electronics" *Material Research Society Fall Meeting & Exhibit 2015*, B6.04, Hynes Convention Center and Sheraton Boston Hotel, Boston, MA, USA (December, 2015).
23. P. Zalar, **N. Matsuhisa**, Y. Ju, T. Yokota, and T. Someya, "Development and Characterization of Bulk Heterojunction Organic Photodetectors on 1- μ m Plastic Substrates", *Material Research Society Fall Meeting & Exhibit 2015*, Boston, MA, USA (December, 2015).
24. (Invited talk) T. Someya, **N. Matsuhisa**, T. Sekitani, T. Yokota, "Stretchable and Ultraflexible Electronics for E-Textile and Wearable Devices", *Material Research Society Fall Meeting & Exhibit 2015*, BB2.01, Hynes Convention Center and Sheraton Boston Hotel, Boston, MA, USA (November 30th, 2015).
25. H. Jin, **N. Matsuhisa**, T. Yokota, K. Takashima, M. Nakajima, I. Amimori, and T. Someya, "Highly Stretchable Silver fluoropolymer composite Directly Printed on Textile", *ICFPE2015*, Taipei World Trade Center Nangang Exhibition Hall, (October 2015).
26. S. Harimurti, **N. Matsuhisa**, P. Zalar, T. Yokota, and T. Someya, "Realizing Mechanically Robust ITO and PEDOT:PSS by Reducing Substrate Thickness to as Thin as 1.4 μ m", *SSDM2015*, Sapporo Convention Center, Hokkaido, Japan (September 2015).
27. T. Nakamura, Y. Inoue, D. Kim, **N. Matsuhisa**, T. Yokota, T. Sekitani, T. Someya, and M. Sekino, "An MRI-readable wireless flexible pressure sensor" *2015 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, Milano Conference Center, Milan, Italy (August 2015); *In Proceedings of 2015 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 3173-3176 (2015).
28. (Invited talk) I. Amimori, M. Nakajima, Y. Aikawa, **N. Matsuhisa**, H. Jin, H. Sakamoto, S. Lee, S. Lee, T. Yokota, T. Sekitani, H. Onodera, and T. Someya, "Ultrathin and Ultraflexible Electronics Will Hack Our Way Beyond Wearable", *2015 International Conference on Electronics Packaging & iMAPS All Asia Conference*, TC1-3, Kyoto Terrsa, Kyoto, Japan (April 16th, 2015).
29. H. Jinno, T. Yokota, Y. Tachibana, **N. Matsuhisa**, M. Kaltenbrunner, T. Sekitani, and T. Someya, "Flexible, ultralow voltage organic pseudo-CMOS inverter with amorphous titanium oxide dielectric operated at sub-1V", *2015 MRS Spring Meeting and Exhibit*, the Moscone West Convention Center, CA, USA (April 2015).
30. W. Lee, M. Kaltenbrunner, J. Rivnay, **N. Matsuhisa**, M. Ferro, T. Yokota, T. Sekitani, G. Malliaras and T. Someya, "Actively multiplexed bio-electrical signal sensor array using organic transistors and organic electro chemical transistors", *2015 MRS Spring Meeting and Exhibit*, Moscone West and San Francisco Marriott, CA, USA, (APR 2015).
31. **N. Matsuhisa**, M. Kaltenbrunner, T. Yokota, H. Jinno, C. Okutani, T. Sekitani, and T. Someya, "Stretchable Conductor Wiring with Printing Technology for Large Area Stretchable Electronics", *Material Research Society Spring Meeting & Exhibit 2015*, LL8.04, Moscone West and San Francisco Marriott, San Francisco, CA, USA (April 9th, 2015).

32. (Invited talk) T. Someya, T. Sekitani, T. Yokota, M. Kaltenbrunner, Sungwon Lee, and **N. Matsuhisa**, "Ultraflexible Organic Thin-Film Devices for Large-Area Sensor Applications", *Material Research Society Fall Meeting & Exhibit 2014*, ZZ3.01, Hynes Convention Center and Sheraton Boston Hotel, Boston, MA, USA (December 2nd, 2014).
33. **N. Matsuhisa**, M. Kaltenbrunner, H. Jinno, T. Yokota, T. Sekitani, and T. Someya, "Printable, Highly Conductive Elastic Conductors for Stretchable Organic Transistors", *Material Research Society Fall Meeting & Exhibit 2014*, K2.05, Hynes Convention Center and Sheraton Boston Hotel, Boston, MA, USA (December 1st, 2014).
34. A. Reuveny, T. Yokota, M. Koizumi, M. Kaltenbrunner, **N. Matsuhisa**, T. Sekitani, and T. Someya, "Ultrathin, short channel, thermally-stable organic transistors for neural interface systems", *Biomedical Circuits and Systems Conference (BioCAS) 2014*, The SWISSTECH CONVENTION CENTER, Switzerland (October 2014); *In Proceedings of Biomedical Circuits and Systems Conference (BioCAS)*, 2014 IEEE, 576-579 (2014).
35. T. Nakamura, Y. Inoue, D. Kim, **N. Matsuhisa**, T. Yokota, T. Sekitani, T. Someya, and M. Sekino, "Basic Characteristics of Implantable Flexible Pressure Sensor for Wireless Readout using MRI", *EMBC 2014*, the Sheraton Hotel & Towers, Chicago, IL, USA (August 2014); *In Proceedings of 36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society 2014*, 2338-2341 (2014).
36. **N. Matsuhisa**, H. Jinno, M. Kaltenbrunner, T. Yokota, T. Sekitani, and T. Someya, "Stretchable Transistor Active Matrix on a Modulus-Gradient Substrate with Elastic Conductors", *Material Research Society Fall Meeting & Exhibit 2013*, K2.05, Hynes Convention Center and Sheraton Boston Hotel, Boston, MA, USA (December 2nd 2013).
37. (Poster) **N. Matsuhisa**, H. Hirai, T. Yokota, K. Kuribara, T. Sekitani, and T. Someya, "Stencil Printing of an Elastic Conductor on a Modulus-gradient Substrate for Reliable Stretchable Organic Transistors", *Material Research Society Spring Meeting & Exhibit 2013*, JJ13.03, Moscone West and San Francisco Marriott, San Francisco, CA, USA (April 3rd 2013).
38. T. Sekitani, T. Yokota, **N. Matsuhisa**, M. Kaltenbrunner, Y. Inoue, M. Sekino, H. Fuketa, M. Takamiya, T. Sakurai, and T. Someya, "Organic Active Matrix Amplifier System of 1- μ m Thickness for Multi-channel Surface Electromyogram Measurement", *2013 MRS Spring Meeting*, Moscon Convention Center, San Francisco, CA, USA (April 2013).
39. J. Reeder, T. Ware, D. Simon, **N. Matsuhisa**, T. Sekitani, T. Someya, and W. Voit, "Flexible Organic Transistors on Shape Memory Polymer Substrates for Conformable Biointegrated Interface", *2013 and Beyond: Flexible Electronics: Semiconductor Advances in Flexible Electronics Systems*, Henry B. Gonzalez Convention Center, San Antonio, TX, USA (March 4, 2013).
40. H. Fuketa, K. Yoshioka, Y. Shinozuka, K. Ishida, T. Yokota, **N. Matsuhisa**, Y. Inoue, M. Sekino, T. Sekitani, M. Takamiya, T. Someya, and T. Sakurai, "1- μ m Thickness 64 Channel Surface Electromyogram Measurement Sheet with 2V Organic Transistors for Prosthetic Hand Control", *International Solid-State Circuits Conference 2013*, 6.4, San Francisco, CA, USA (February 17th-21st 2013); *In Proceedings of International Solid-State Circuits Conference Digest of Technical Papers (ISSCC)*, 2013 IEEE International. IEEE, 104-105 (2013).
41. (Poster) **N. Matsuhisa**, H. Hirai, T. Yokota, T. Sekitani, and T. Someya, "Design Rules for Elastomeric Interconnects Enabling Stretchable Organic Transistor Active Matrix Arrays", *International Thin-Film Transistor Conference 2013*, 1pLP24, The University of Tokyo, Tokyo, Japan (January 2013).
42. (Invited talk) T. Sekitani, T. Yokota, **N. Matsuhisa**, M. Kaltenbrunner, H. Fuketa, M. Takamiya, T. Sakurai, and T. Someya, "1- μ m-thick, ultraflexible organic amplifier for bio-medical applications", *International Thin-Film Transistor Conference 2013*, 2aBI01, The University of Tokyo, Tokyo, Japan (January 2013).
43. (Poster) **N. Matsuhisa**, T. Yokota, T. Sekitani, and T. Someya, "Organic transistor fabricated on stretchable urethane substrate", *International Conference on Flexible and Printed Electronics 2012*, S20-P3, The University of Tokyo, Tokyo, Japan (September 7th 2012).

TEACHING

1. 固体物性工学/Solid Physical Properties, Keio University (Fall 2020~).
2. “電波の性質/Characteristics of Electromagnetic Waves” 電気情報工学実験第一/Experiment I about Electronics and Information, Keio University (Spring 2020~).
3. “回路の共振/Resonance of electrical circuits” 理工学基礎実験/Experiments on the Basics of Science, Keio University (Spring 2020~).
4. “Fabrication of Electrical Filter”, The University of Tokyo (Spring 2012, & 2013).
5. “Electrical Circuit”, The University of Tokyo (Spring 2012).

GRANTS

1. JST A-STEP Tryout, 2,300,000 JPY (October 2022 ~ September 2023).

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2. Grant-in-Aid for Challenging Exploratory Research, Japan Society for the Promotion of Science, 2,500,000 JPY (July 2022 ~ March 2024).
 3. Inamori Foundation, 1,000,000 JPY (April 2022 ~ March 2023).
 4. Tateisi Science and Technology Foundation, 2,500,000 JPY (April 2021 ~ March 2023).
 5. The Kao Foundation for Arts and Sciences, 2,000,000 JPY (April 2021 ~ March 2023).
 6. Yazaki Memorial Foundation for Science and Technology, 1,000,000 JPY (April 2021 ~ March 2022).
 7. International Polyurethane Technology Foundation, 1,000,000 JPY (April 2021 ~ March 2022).
 8. Shorai Foundation for Science and Technology, 1,000,000 JPY (January 2021 ~ March 2023).
 9. The Takano Science Foundation, 1,000,000 JPY (December 2020 ~ December 2021).
 10. The Amada Foundation, 2,000,000 JPY (November 2020 ~ March 2023).
 11. JST PRESTO, 40,000,000 JPY (December 2020 ~ March 2024).
 12. The Mazda Foundation, 1,000,000 JPY (September 2020 ~ March 2023).
 13. JGC-S Scholarship Foundation, 2,000,000 JPY (September 2020 ~ August 2022).
 14. The Foundation for the Promotion of Ion Engineering, 800,000 JPY (August 2020 ~ March 2022).
 15. A start up research grant from Keio Global Research Institute (KGRI), 4,000,000 JPY (June 2020 ~ March 2022).
 16. Overseas Research Fellowships, Japan Society for the Promotion of Science, 6,278,000 JPY (April 2019 ~ March 2020).
 17. Research Fellowships for Young Scientists, Japan Society for the Promotion of Science (April 2016 ~ March 2017).

AWARDS

1. MIT Technology Review 35 Innovators Under 35 Global (June 2022).
2. Young Scientist Presentation Award from The Japan Society of Applied Physics (June 2022).
3. Light upon the Mountain Award (April 2022).
4. Ando Incentive Prize for the Study of Electronics, The Foundation of Ando Laboratory (June 2021).
5. Funai Research Encouragement Award, The Funai Foundation (May 2021).
6. Kao Science Encouragement Award (April 2021).
7. Encouragement Award of Telecommunications Systems Technology, The Telecommunications Advancement Foundation (March 2021).
8. Inoue Research Award for Young Scientists, Inoue Foundation for Science (February 2019).
9. Excellent Doctor's Thesis Award, Department of Electrical Engineering and Information Systems, The University of Tokyo (March 2017).
10. Student Poster Award, "High Current Density, Flexible Organic Diodes for Flexible Sensor Matrices", 2016 International Conference on Flexible and Printed Electronics (ICFPE) (September 2016).
11. "Stretchable Conductive Inks for e-textile applications" Innovative Technologies 2015, Digital Contents EXPO, Japanese Ministry of Economy, Trade and Industry (MEXT) (October 2015).
12. "Stretchable Conductive Inks for e-textile applications" Jury's Special Awards "Human", Innovative Technologies 2015, Digital Contents EXPO, Japanese Ministry of Economy, Trade and Industry (MEXT) (October 2015).
13. "Stretchable Conductive Inks for e-textile applications" Jury's Special Awards "Industry", Innovative Technologies 2015, Digital Contents EXPO, Japanese Ministry of Economy, Trade and Industry (MEXT) (October 2015).
14. Excellent Master's Thesis Award, Department of Electrical Engineering and Information Systems, The University of Tokyo (March 2014).
15. Excellent Bachelor's Thesis Award, Department of Electrical Engineering, The University of Tokyo (March 2012).

MEDIA COVERAGE

1. Nikkei Sangyo Newspaper (January 2022)
<https://www.nikkei.com/article/DGXZQOUC229090S1A221C2000000/>
2. Dempa Newspaper (January 2022)
<https://dempa-digital.com/article/275222>

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3. C&EN (December 2021)
<https://cen.acs.org/materials/electronic-materials/Stretchy-diode-add-wireless-communication/99/i45>
 4. Nikkan Kogyo Newspaper (December 2021)
<https://newswitch.jp/p/30024>
 5. あいつ今何してる? (Aitsuimananishiteru?), TV Asahi (February 2020)
 6. Forbes Japan (September 2019)
<https://forbesjapan.com/articles/detail/29408>
 7. Nikkan Kogyo Shimbun Newspaper (May 2017)
 8. The Wall Street Journal (June 2015)
<http://blogs.wsj.com/japanrealtime/2015/06/26/univ-of-tokyo-researchers-develop-electricity-conducting-ink/>
 9. MRS 360 online
http://www.mrs.org/NewsLetter/2015/mat360_2015_8_2.html
 10. World Business Satellite, TV Tokyo (July 2015)
http://www.tv-tokyo.co.jp/mv/wbs/trend_tamago/post_93235/
 11. Sensors, TV Nippon (November 2015)
<http://www.sensors.jp/post/dcexpo.html>
 12. Textile News Newspaper (July 2015)
<http://www.nanoquine.iis.u-tokyo.ac.jp/newspaper/news2015/news20150703-2.pdf>
 13. The Kagaku Shimbun Newspaper (July 2015)
<http://www.nanoquine.iis.u-tokyo.ac.jp/newspaper/news2015/news20150703-1.pdf>
 14. The Asahi Shimbun Newspaper (July 2015)
<http://www.nanoquine.iis.u-tokyo.ac.jp/newspaper/news2015/news20150702-1.pdf>
 15. The Mainichi Shimbun Newspaper (June 2015)
<http://www.nanoquine.iis.u-tokyo.ac.jp/newspaper/news2015/news20150627-1.pdf>
 16. The Chemical Diary Newspaper
<http://www.nanoquine.iis.u-tokyo.ac.jp/newspaper/news2015/news20150626-4.pdf>
 17. Nikkan Kogyo Shimbun Newspaper
<http://www.nanoquine.iis.u-tokyo.ac.jp/newspaper/news2015/news20150626-3.pdf>
 18. Nikkei Sangyo Newspaper
<http://www.nanoquine.iis.u-tokyo.ac.jp/newspaper/news2015/news20150626-2.pdf>
 19. Nikkei Shimbun Newspaper
<http://www.nanoquine.iis.u-tokyo.ac.jp/newspaper/news2015/news20150626-1.pdf>

SKILLS

Leadership and Management:

- Leadership role in mentoring and training master students
- Leadership role in establishing and enforcing laboratory safety and standardized experimental protocols
- Leadership role to decide research themes
- Discussion and close collaboration with biologists for application driven material and device design

Scientific and Computer:

- Design, fabrication and characterization of conductive inks
- Electronic and physical characterization of stretchable materials
- Electronic, optical and physical characterization of organic semiconductors and electronic devices (OFET, OPV, OLED)
- Processing, optimization, and design of organic electronic materials and device architectures
- Extensive experience in micro- and nanoscopic characterization (e.g. AFM, SEM, TOF-SIMS)
- Experience in a class 100 clean-room environment
- Experience in use and maintenance of inert-atmosphere glove boxes
- Maintenance of high-vacuum probe-stations and thermal evaporation systems
- Adobe Illustrator, Premiere Pro, Autodesk inventor, Autodesk 3ds max, Kaleida Graph, LabVIEW, Windows: Office Suite

Communication and Language:

- Japanese (Native), English (Business Level), Spanish (Basic)
- Presentation delivery at large international conferences
- Writing and editing of scientific documents for experts and the general public

Reviewer experience:

- ACS Applied Materials and Interfaces
- ACS Materials Letters
- ACS Nano
- ACS Omega
- Advanced Electronic Materials
- Advanced Materials
- Advanced Fiber Materials
- Advanced Functional Materials
- Advanced Intelligent Systems
- Advanced Materials
- Advanced Materials Technologies
- Applied Physics Letters
- Communications Materials
- Journal of Materials Chemistry C
- Nanoscale
- Nanoscale Horizons
- npj flexible electronics
- Nature Communications
- Nature Electronics
- Nature Food
- Science
- Science Advances
- Small
- Small Structures

PROFESSIONAL REFERENCES

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| 1. Prof. Takao Someya
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| 4. Prof. Tsuyoshi Sekitani
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Johannes Kepler University Linz
E-mail: martin.kaltenbrunner@jku.at | |

Others

1. High-frequency and intrinsically stretchable polymer diodes
<https://www.youtube.com/watch?v=Km1-LbqoHGI>
2. Introduction video for printable elastic conductors
<https://www.youtube.com/watch?v=aAdRIbcEDv4>