



Shan X. Wang

Leland T. Edwards Professor in the School of Engineering and Professor of Electrical Engineering and, by courtesy, of Radiology (Molecular Imaging Program at Stanford) Materials Science and Engineering

 NIH Biosketch available Online

 Resume available Online

CONTACT INFORMATION

- **Administrator**

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Bio

BIO

Dr. Wang is the Leland T. Edwards Professor in the School of Engineering and Professor of Materials Science and Engineering, jointly of Electrical Engineering and, by courtesy, of Radiology (Molecular Imaging Program at Stanford). He directs the Center for Magnetic Nanotechnology and is a leading expert in biosensors, information storage and spintronics. His research and inventions span across a variety of areas including magnetic biochips, in vitro diagnostics, cancer biomarkers, magnetic nanoparticles, magnetic sensors, magnetoresistive random access memory, and magnetic integrated inductors. He has over 300 publications, and holds 70 issued or pending patents in these and interdisciplinary areas. He was named an inaugural Fred Terman Fellow, and was elected a Fellow of the Institute of Electrical and Electronics Engineers (IEEE), a Fellow of American Physical Society (APS) and a Fellow of National Academy of Inventors (FNAI) for his seminal contributions to magnetic materials, nanosensors and cancer diagnostics. His team won the Grand Challenge Exploration Award from Gates Foundation (2010), the XCHALLENGE Distinguished Award (2014), and the Bold Epic Innovator Award from the XPRIZE Foundation (2017). He coauthored two textbooks: Magnetic Information Storage Technology (Academic Press) and Biochips and Medical Imaging (Wiley).

Dr. Wang cofounded six high-tech startups in Silicon Valley, including Curve Biosciences, Magic Lifescience, MagArray, and Nvigen. In 2023, Curve Biosciences demonstrated a circulating tumor DNA NGS assay, enabling early detection of liver cancer from cirrhosis with unprecedented sensitivity and specificity (both #95%); Magic received a Gates Foundation grant and launched clinical trials to seek FDA clearance for its rapid NAT products at POC. In 2018 MagArray launched a first of its kind lung cancer early diagnostic assay based on protein cancer biomarkers and support vector machine (SVM). Through his participation and leadership in Cancer Nanotechnology Excellence, Semiconductor Research Corp (SRC) and Microelectronics Commons, he is actively engaged in the transformative R&D of healthcare, energy-efficient computing and edge AI.

ACADEMIC APPOINTMENTS

- Professor, Materials Science and Engineering
- Professor, Electrical Engineering
- Professor (By courtesy), Radiology - Rad/Molecular Imaging Program at Stanford
- Member, Bio-X
- Member, Cardiovascular Institute

- Member, Maternal & Child Health Research Institute (MCHRI)
- Affiliate, Precourt Institute for Energy
- Member, Stanford Cancer Institute
- Affiliate, Stanford Woods Institute for the Environment
- Member, Wu Tsai Neurosciences Institute

ADMINISTRATIVE APPOINTMENTS

- Associate Chair, Materials Science and Engineering, (2014-2019)

HONORS AND AWARDS

- Fellow, National Academy of Inventors (2021)
- Leland T. Edwards Professor, Stanford University (2018)
- Bold Epic Innovator Award, XPRIZE Foundation (2017)
- Nokia Sensing XCHALLENGE Distinguished Award, XPRIZE Foundation (2014)
- Faculty Award, IBM (2013-4)
- Faculty Fellow, Stanford Center at Peking University (SCP KU) (2013)
- Fellow, American Physical Society (APS) (2012)
- Fellow, The Institute of Electrical and Electronics Engineers (IEEE) (2009)
- Keck Futures Initiative Award, National Academies (2006-7)
- Distinguished Lecturer, IEEE Magnetics Society (2001)
- Partnership Award, IBM (1999)
- Inaugural Frederick Terman Faculty Fellow, Stanford University (1994-97)
- CUSPEA Scholarship, Organized by Nobel Laureate TD Lee (1986)

PROGRAM AFFILIATIONS

- Stanford SystemX Alliance

PROFESSIONAL EDUCATION

- PhD, Carnegie Mellon University , Electrical and Computer Engineering (1993)

COMMUNITY AND INTERNATIONAL WORK

- Fellow, Center for Innovation in Global Health (CIGH), Asia, Africa, America

LINKS

- Wang Group Website: <https://wanggroup.stanford.edu>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Dr. Wang is the Leland T. Edwards Professor in the School of Engineering, Stanford University. He is a Professor of Materials Science & Engineering and jointly a Professor of Electrical Engineering, and by courtesy, a Professor of Radiology (Stanford School of Medicine). He directs the Center for Magnetic Nanotechnology and is a leading expert in biosensors, information storage and spintronics. His research and inventions span across a variety of areas including magnetic biochips, in vitro diagnostics, cancer biomarkers, magnetic nanoparticles, magnetic sensors, magnetoresistive random access memory, and magnetic integrated inductors. He has over 300 publications, and holds 70 issued or pending patents in these and interdisciplinary areas. He was named an inaugural Fred Terman Fellow, and was elected a Fellow

of the Institute of Electrical and Electronics Engineers (IEEE), a Fellow of American Physical Society (APS) and a Fellow of National Academy of Inventors for his seminal contributions to magnetic materials, nanosensors and cancer diagnostics. His team won the Grand Challenge Exploration Award from Gates Foundation (2010), the XCHALLENGE Distinguished Award (2014), and the Bold Epic Innovator Award from the XPRIZE Foundation (2017). He coauthored two textbooks: Magnetic Information Storage Technology (Academic Press) and Biochips and Medical Imaging (Wiley).

Dr. Wang cofounded six high-tech startups in Silicon Valley, including Curve Biosciences, Magic Lifescience, MagArray, and Flux Biosciences. In 2018 MagArray launched a first of its kind lung cancer early diagnostic assay based on protein cancer biomarkers and support vector machine (SVM). In 2023, Curve Biosciences demonstrated a circulating tumor DNA NGS assay, enabling early detection of liver cancer from cirrhosis with unprecedented sensitivity and specificity (both >95%). Through his participation and leadership in Cancer Nanotechnology Excellence and Semiconductor Research Corp (SRC) programs, he is actively engaged in the transformative research of healthcare and is developing emerging memories for energy efficient computing and edge AI.

Dr. Wang obtained his PhD in Electrical and Computer Engineering from Carnegie Mellon University in 1993, MS in Physics from Iowa State University in 1988, and BS in Physics from the University of Science and Technology of China in 1986.

CLINICAL TRIALS

- Identification of Circulating Tumor Cells in the Peripheral Blood of Lung Cancer Patients, Not Recruiting
- COMT Activity and Hypnotizability, Not Specified

Teaching

COURSES

2023-24

- Biochips and Medical Imaging: EE 225, MATSCI 225 (Win)
- Great Inventions That Matter: MATSCI 83N (Aut)
- New Methods in Thin Film Synthesis: MATSCI 312 (Spr)

2022-23

- Biochips and Medical Imaging: EE 225, MATSCI 225, SBIO 225 (Win)
- Great Inventions That Matter: MATSCI 83N (Aut)
- New Methods in Thin Film Synthesis: MATSCI 312 (Spr)

2021-22

- Great Inventions That Matter: MATSCI 83N (Aut)

2020-21

- Biochips and Medical Imaging: EE 225, MATSCI 225, SBIO 225 (Win)
- Great Inventions That Matter: MATSCI 83N (Aut)
- New Methods in Thin Film Synthesis: MATSCI 312 (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Ziad Ali, Jason Saunders, Prima Dewi Sinawang, Haotian Su, Steven Yee

Postdoctoral Faculty Sponsor

Peng Wang, Fen Xue

Doctoral Dissertation Advisor (AC)

Katie Antilla, Jacob Bryan, Christopher Choi, William Hwang

Doctoral Dissertation Co-Advisor (AC)

Kenneth Brinson

Doctoral (Program)

Myunghoon(Young) Chin, Vivek Lam, Itamar Terem, Kelly Woo, Joshua Yang

Postdoctoral Research Mentor

Fen Xue

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Bioengineering (Phd Program)

Publications

PUBLICATIONS

- **Evaluation of restriction and Cas endonuclease kinetics using matrix-insensitive magnetic biosensors.** *Biosensors & bioelectronics*
Im, J., Kim, S., Park, S., Wang, S. X., Lee, J. R.
2024; 249: 116017
- **Real-time temperature correction for magnetoresistive biosensors integrated with temperature modulator.** *Biosensors & bioelectronics: X*
Kim, S., Wang, S. X., Lee, J.
2023; 14
- **Longitudinal analysis of anti-SARS-CoV-2 neutralizing antibody (NAb) titers in vaccinees using a novel giant magnetoresistive (GMR) assay.** *Sensors and actuators. B, Chemical*
Ng, E., Choi, C., Wang, S. X.
2023; 387: 133773
- **Field-free spin-orbit torque switching assisted by in-plane unconventional spin torque in ultrathin [Pt/Co]N.** *Nature communications*
Xue, F., Lin, S. J., Song, M., Hwang, W., Klewe, C., Lee, C. M., Turgut, E., Shafer, P., Vailionis, A., Huang, Y. L., Tsai, W., Bao, X., Wang, et al
2023; 14 (1): 3932
- **Rapid, Point-of-Care Host-Based Gene Expression Diagnostics Using Giant Magnetoresistive Biosensors.** *ACS sensors*
Sofia de Olazarra, A., Chen, F., Wang, T., Wang, S. X.
2023
- **A magnetic hydrogel for the efficient retrieval of kidney stone fragments during ureteroscopy.** *Nature communications*
Ge, T. J., Roquero, D. M., Holton, G. H., Mach, K. E., Prado, K., Lau, H., Jensen, K., Chang, T. C., Conti, S., Sheth, K., Wang, S. X., Liao, J. C.
2023; 14 (1): 3711
- **Advances in point-of-care genetic testing for personalized medicine applications** *BIOMICROFLUIDICS*
de Olazarra, A. S., Wang, S. X.
2023; 17 (3): 031501
- **Observation of anti-damping spin-orbit torques generated by in-plane and out-of-plane spin polarizations in MnPd3.** *Nature materials*
De, M., Shao, D. F., Hou, V. D., Vailionis, A., Quarterman, P., Habiboglu, A., Venuti, M. B., Xue, F., Huang, Y. L., Lee, C. M., Miura, M., Kirby, B., Bi, et al
2023
- **EFFICACY AND SAFETY OF A MAGNETIC HYDROGEL FOR STONE FRAGMENT REMOVAL: AN IN VITRO AND IN VIVO STUDY**
Roquero, D., Ge, T., Holton, G. H., Mach, K. E., Kornberg, Z., Sun, R., Conti, S., Wang, S. X., Liao, J. C.
LIPPINCOTT WILLIAMS & WILKINS.2023: E819
- **Energy Efficient Computing With High-Density, Field-Free STT-Assisted SOT-MRAM (SAS-MRAM)** *IEEE TRANSACTIONS ON MAGNETICS*
Hwang, W., Xue, F., Zhang, F., Song, M., Lee, C., Turgut, E., Chen, T. C., Bao, X., Tsai, W., Fan, D., Wang, S. X.

2023; 59 (3)

- **Large Spin-Orbit-Torque Efficiency and Room-Temperature Magnetization Switching in SrIrO₃/Co-Fe-B Heterostructures** *PHYSICAL REVIEW APPLIED*
Li, P., Channa, S., Li, X., Alahmed, L., Tang, C., Yi, D., Riddiford, L., Wisser, J., Balakrishnan, P. P., Zheng, X., Lu, D., Vailionis, A., Wang, et al
2023; 23 (2)
- **Point of care testing of enzyme polymorphisms for predicting hypnotizability and postoperative pain.** *The Journal of molecular diagnostics : JMD*
Cortade, D. L., Markovits, J., Spiegel, D., Wang, S. X.
2023
- **2-Terminal, High Density, and Magnetic Field Free SOT-MRAM**
Hwang, W., Xue, F., Tsai, W., Wang, S. X., IEEE
IEEE.2023
- **Quantitative and rapid detection of morphine and hydromorphone at the point of care by an automated giant magnetoresistive nanosensor platform.** *Analytical and bioanalytical chemistry*
Cortade, D. L., Wang, S. X.
2022
- **Giant Orbital Anisotropy with Strong Spin-Orbit Coupling Established at the Pseudomorphic Interface of the Co/Pd Superlattice.** *Advanced science (Weinheim, Baden-Wurttemberg, Germany)*
Kim, S., Pathak, S., Rhim, S. H., Cha, J., Jekal, S., Hong, S. C., Lee, H. H., Park, S., Lee, H., Park, J., Lee, S., Steinruck, H., Mehta, et al
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- **Magnetic supercluster particles for highly sensitive magnetic biosensing of proteins.** *Mikrochimica acta*
Kim, S., Kim, J., Im, J., Kim, M., Kim, T., Wang, S. X., Kim, D., Lee, J.
2022; 189 (7): 256
- **From saliva to SNP: non-invasive, point-of-care genotyping for precision medicine applications using recombinase polymerase amplification and giant magnetoresistive nanosensors.** *Lab on a chip*
de Olazarra, A. S., Cortade, D. L., Wang, S. X.
2022
- **A GMR-based assay for quantification of the human response to influenza.** *Biosensors & bioelectronics*
Ravi, N., Chang, S. E., Franco, L. M., Nagamani, S. C., Khatri, P., Utz, P. J., Wang, S. X.
2022; 205: 114086
- **An automated and mobile magnetoresistive biosensor system for early hepatocellular carcinoma diagnosis.** *Biosensors & bioelectronics*
Yao, C., Ng, E., Wang, S. X.
1800; 202: 113982
- **Performance Benchmarking of Spin-Orbit Torque Magnetic RAM (SOT-MRAM) for Deep Neural Network (DNN) Accelerators**
Luo, Y., Kumar, P., Liao, Y., Hwang, W., Xue, F., Tsai, W., Wang, S. X., Naemi, A., Yu, S., IEEE
IEEE.2022: 73-76
- **A Self-Sustained Current Sensor for Smart Grid Application** *IEEE TRANSACTIONS ON INDUSTRIAL ELECTRONICS*
Wang, Z., Hu, J., Ouyang, Y., Deng, Y., Zhao, G., He, J., Wang, S. X.
2021; 68 (12): 12810-12820
- **Spin-orbit torques of an in-plane magnetized system modulated by the spin transport in the ferromagnetic Co layer** *APL MATERIALS*
Xue, F., Lin, S., Li, P., Hwang, W., Huang, Y., Tsai, W., Wang, S. X.
2021; 9 (10)
- **Charge-spin interconversion in epitaxial Pt probed by spin-orbit torques in a magnetic insulator** *PHYSICAL REVIEW MATERIALS*
Li, P., Riddiford, L. J., Bi, C., Wisser, J. J., Sun, X., Vailionis, A., Veit, M. J., Altman, A., Li, X., Mahendra, D. C., Wang, S. X., Suzuki, Y., Emori, et al
2021; 5 (6)
- **Large and robust charge-to-spin conversion in sputtered conductive WTex with disorder** *MATTER*
Li, X., Li, P., Hou, V., Mahendra, D. C., Nien, C., Xue, F., Yi, D., Bi, C., Lee, C., Lin, S., Tsai, W., Suzuki, Y., Wang, et al
2021; 4 (5): 1639-1653

- **Tunable spin-orbit torque efficiency in in-plane and perpendicular magnetized [Pt/Co](n) multilayer** *APPLIED PHYSICS LETTERS*
Xue, F., Lin, S., Mahendra, D. C., Bi, C., Li, X., Tsai, W., Wang, S. X.
2021; 118 (4)
- **Giant Magnetoresistive Nanosensor Analysis of Circulating Tumor DNA Epidermal Growth Factor Receptor Mutations for Diagnosis and Therapy Response Monitoring.** *Clinical chemistry*
Nesvet, J. C., Antilla, K. A., Pancirer, D. S., Lozano, A. X., Preiss, J. S., Ma, W. n., Fu, A. n., Park, S. M., Gambhir, S. S., Fan, A. C., Neal, J. W., Padda, S. K., Das, et al
2021
- **Challenges toward Low-Power SOT-MRAM**
Lin, S., Huang, Y., Song, M., Lee, C., Xue, F., Chen, G., Yang, S., Chang, Y., Wang, I., Hsin, Y., Su, Y., Wei, J., Pai, et al
IEEE.2021
- **Ultrahigh Spin-Orbit Torque Efficiency at Spin Reorientation Transition State in Pt/Co Multilayer**
Xue, F., Lin, S., Dc, M., Bi, C., Li, X., Tsai, W., Wang, S. X., IEEE
IEEE.2021
- **A Novel Current Reconstruction Method Based on Elastic Net Regularization** *IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT*
Zhao, G., Hu, J., He, J., Wang, S. X.
2020; 69 (10): 7484–93
- **Diagnostics for SARS-CoV-2 detection: A comprehensive review of the FDA-EUA COVID-19 testing landscape.** *Biosensors & bioelectronics*
Ravi, N., Cortade, D. L., Ng, E., Wang, S. X.
2020; 165: 112454
- **Parametric Reconstruction of Multiple Line Currents Based on Magnetic Sensor Array** *IEEE TRANSACTIONS ON MAGNETICS*
Zhao, G., Hu, J., Ma, H., He, J., Wang, S. X.
2020; 56 (7)
- **Flow Homogenization Enables a Massively Parallel Fluidic Design for High-throughput and Multiplexed Cell Isolation.** *Advanced materials technologies*
Ooi, C., Earhart, C. M., Hughes, C. E., Lee, J. R., Wong, D. J., Wilson, R. J., Rohatgi, R., Wang, S. X.
2020; 5 (5)
- **Drive-Current-Free Switch With Internal Transduction in a Magneto Piezo-Electronic Transistor** *IEEE TRANSACTIONS ON INDUSTRIAL ELECTRONICS*
Xue, F., Guo, Y., Sato, N., Ouyang, Y., Han, Z., Wang, S. X., Hu, J., He, J.
2020; 67 (4): 3257–66
- **Flow Homogenization Enables a Massively Parallel Fluidic Design for High-Throughput and Multiplexed Cell Isolation** *ADVANCED MATERIALS TECHNOLOGIES*
Ooi, C., Earhart, C. M., Hughes, C. E., Lee, J., Wong, D. J., Wilson, R. J., Rohatgi, R., Wang, S. X.
2020
- **Carbon-coated FeCo nanoparticles as sensitive magnetic-particle-imaging tracers with photothermal and magnetothermal properties.** *Nature biomedical engineering*
Song, G. n., Kenney, M. n., Chen, Y. S., Zheng, X. n., Deng, Y. n., Chen, Z. n., Wang, S. X., Gambhir, S. S., Dai, H. n., Rao, J. n.
2020
- **Spin-Orbit-Torque Material Exploration for Maximum Array-Level Read/Write Performance**
Liao, Y., Kumar, P., Dc, M., Li, X., Zhang, D., Wang, J., Wang, S. X., Ralph, D. C., Naeemi, A., IEEE
IEEE.2020
- **A mountable toilet system for personalized health monitoring via the analysis of excreta.** *Nature biomedical engineering*
Park, S. M., Won, D. D., Lee, B. J., Escobedo, D. n., Esteva, A. n., Aalipour, A. n., Ge, T. J., Kim, J. H., Suh, S. n., Choi, E. H., Lozano, A. X., Yao, C. n., Bodapati, et al
2020
- **Piezoelectric-Piezoresistive Coupling MEMS Sensors for Measurement of Electric Fields of Broad Bandwidth and Large Dynamic Range** *IEEE TRANSACTIONS ON INDUSTRIAL ELECTRONICS*
Xue, F., Hu, J., Guo, Y., Han, G., Ouyang, Y., Wang, S. X., He, J.

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- **Publisher Correction: A mountable toilet system for personalized health monitoring via the analysis of excreta.** *Nature biomedical engineering*
Park, S. M., Won, D. D., Lee, B. J., Escobedo, D. n., Esteva, A. n., Aalipour, A. n., Ge, T. J., Kim, J. H., Suh, S. n., Choi, E. H., Lozano, A. X., Yao, C. n., Bodapati, et al
2020
- **Early multiplexed detection of cirrhosis by giant magnetoresistive biosensors with protein biomarkers.** *ACS sensors*
Ng, E. n., Le, A. K., Nguyen, M. H., Wang, S. X.
2020
- **Materials Requirements of High-Speed and Low-Power Spin-Orbit-Torque Magnetic Random-Access Memory**
Li, X., Lin, S., De, M., Liao, Y., Yao, C., Naeemi, A., Tsai, W., Wang, S. X.
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2020: 674–80
- **Method of inter-turn fault detection for next-generation smart transformers based on deep learning algorithm** *HIGH VOLTAGE*
Duan, L., Hu, J., Zhao, G., Chen, K., Wang, S. X., He, J.
2019; 4 (4): 282–91
- **Large voltage control of magnetic anisotropy in CoFeB/MgO/OX structures at room temperature** *APL MATERIALS*
Xue, F., Sato, N., Bi, C., Hu, J., He, J., Wang, S. X.
2019; 7 (10)
- **Efficient spin current generation in low-damping Mg(Al, Fe)(2)O-4 thin films** *APPLIED PHYSICS LETTERS*
Riddiford, L. J., Wisser, J. J., Emori, S., Li, P., Roy, D., Cogulu, E., van't Erve, O., Deng, Y., Wang, S. X., Jonker, B. T., Kent, A. D., Suzuki, Y.
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- **Current sensors based on GMR effect for smart grid applications** *SENSORS AND ACTUATORS A-PHYSICAL*
Ouyang, Y., Wang, Z., Zhao, G., Hu, J., Ji, S., He, P., Wang, S. X.
2019; 294: 8–16
- **Identification of Partial Discharge Defects Based on Deep Learning Method** *IEEE TRANSACTIONS ON POWER DELIVERY*
Duan, L., Hu, J., Zhao, G., Chen, K., He, J., Wang, S. X.
2019; 34 (4): 1557–68
- **Overhead Transmission Line Parameter Reconstruction for UAV Inspection Based on Tunneling Magnetoresistive Sensors and Inverse Models** *IEEE TRANSACTIONS ON POWER DELIVERY*
Wu, Y., Zhao, G., Hu, J., Ouyang, Y., Wang, S. X., He, J., Gao, F., Wang, S.
2019; 34 (3): 819–27
- **Quantification of cDNA on GMR biosensor array towards point-of-care gene expression analysis** *BIOSENSORS & BIOELECTRONICS*
Ravi, N., Rizzi, G., Chang, S. E., Cheung, P., Utz, P. J., Wang, S. X.
2019; 130: 338–43
- **Magnetoresistive Sensor Development Roadmap (Non-Recording Applications)** *IEEE TRANSACTIONS ON MAGNETICS*
Zheng, C., Zhu, K., de Freitas, S., Chang, J., Davies, J. E., Eames, P., Freitas, P. P., Kazakova, O., Kim, C., Leung, C., Liou, S., Ognev, A., Piramanayagam, et al
2019; 55 (4)
- **Self-healing of electrical damage in polymers using superparamagnetic nanoparticles** *NATURE NANOTECHNOLOGY*
Yang, Y., He, J., Li, Q., Gao, L., Hu, J., Zeng, R., Qin, J., Wang, S. X., Wang, Q.
2019; 14 (2): 151–+
- **Magneto-nanosensor smartphone platform for the detection of HIV and leukocytosis at point-of-care** *NANOMEDICINE-NANOTECHNOLOGY BIOLOGY AND MEDICINE*
Ng, E., Yao, C., Shultz, T. O., Ross-Howe, S., Wang, S. X.
2019; 16: 10–19
- **Highly sensitive detection of DNA hypermethylation in melanoma cancer cells** *BIOSENSORS & BIOELECTRONICS*
Nesvet, J., Rizzi, G., Wang, S. X.
2019; 124: 136–42

- **An electrodynamic energy harvester with a 3D printed magnet and optimized topology** *APPLIED PHYSICS LETTERS*
Wang, Z., Huber, C., Hu, J., He, J., Suess, D., Wang, S. X.
2019; 114 (1)
- **GMR Spin-Valve Biosensors** *SPINTRONICS HANDBOOK: SPIN TRANSPORT AND MAGNETISM: NANOSCALE SPINTRONICS AND APPLICATIONS, VOL 3, 2ND EDITION*
Lee, J., Gaster, R. S., Hall, D. A., Wang, S. X., Tsymbal, E. Y., Zutic
2019: 471–97
- **Interfacial engineering of SOT-MRAM to modulate atomic diffusion and enable PMA stability > 400 degrees C**
Bi, C., Lin, S., Li, X., Simsek, T., Song, M., Tsai, W., Wang, S. X., IEEE
IEEE.2019
- **An Automated, Quantitative, and Multiplexed Assay Suitable for Point-of-Care Hepatitis B Virus Diagnostics.** *Scientific reports*
Gani, A. W., Wei, W. n., Shi, R. Z., Ng, E. n., Nguyen, M. n., Chua, M. S., So, S. n., Wang, S. X.
2019; 9 (1): 15615
- **Improved detection of prostate cancer using a magneto-nanosensor assay for serum circulating autoantibodies.** *PloS one*
Xu, L., Lee, J., Hao, S., Ling, X. B., Brooks, J. D., Wang, S. X., Gambhir, S. S.
2019; 14 (8): e0221051
- **In Vitro Cancer Diagnostics** *NANOTHERANOSTICS FOR CANCER APPLICATIONS*
Lee, J., Ooi, C., Wang, S. X., Rai, P., Morris, S. A.
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- **Self-healing of electrical damage in polymers using superparamagnetic nanoparticles.** *Nature nanotechnology*
Yang, Y., He, J., Li, Q., Gao, L., Hu, J., Zeng, R., Qin, J., Wang, S. X., Wang, Q.
2018
- **Magneto-nanosensor Smartphone Platform for the Detection of HIV and Leukocytosis at Point-of-Care.** *Nanomedicine : nanotechnology, biology, and medicine*
Ng, E., Yao, C., Shultz, T. O., Ross-Howe, S., Wang, S. X.
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Kim, K., Hall, D. A., Yao, C., Lee, J., Ooi, C. C., Bechstein, D. B., Guo, Y., Wang, S. X.
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- **Magneto-resistive biosensors with on-chip pulsed excitation and magnetic correlated double sampling.** *Scientific reports*
Kim, K., Hall, D. A., Yao, C., Lee, J., Ooi, C. C., Bechstein, D. J., Guo, Y., Wang, S. X.
2018; 8 (1): 16493
- **Highly sensitive detection of DNA hypermethylation in melanoma cancer cells.** *Biosensors & bioelectronics*
Nesvet, J., Rizzi, G., Wang, S. X.
2018; 124-125: 136–42
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Ravi, N., Rizzi, G., Chang, S. E., Cheung, P., Utz, P. J., Wang, S. X.
2018
- **An intravascular magnetic wire for the high-throughput retrieval of circulating tumour cells in vivo** *NATURE BIOMEDICAL ENGINEERING*
Vermesh, O., Aalipour, A., Ge, T., Saenz, Y., Guo, Y., Alam, I. S., Park, S., Adelson, C. N., Mitsutake, Y., Vilches-Moure, J., Godoy, E., Bachmann, M. H., Ooi, et al
2018; 2 (9): 696–705
- **Two-terminal spin-orbit torque magneto-resistive random access memory** *NATURE ELECTRONICS*
Sato, N., Xue, F., White, R. M., Bi, C., Wang, S. X.
2018; 1 (9): 508–11
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2018; 2 (9): 696-705
- **A blood biomarker for monitoring response to anti-EGFR therapy.** *Cancer biomarkers : section A of Disease markers*
Hughes, N. P., Xu, L., Nielsen, C. H., Chang, E., Hori, S. S., Natarajan, A., Lee, S., Kjar, A., Kani, K., Wang, S. X., Mallick, P., Gambhir, S. S.
2018
 - **Learning-based Data Analytics: Moving Towards Transparent Power Grids** *CSEE JOURNAL OF POWER AND ENERGY SYSTEMS*
Chen, K., He, Z., Wang, S. X., Hu, J., Li, L., He, J.
2018; 4 (1): 67-82
 - **Longitudinal Multiplexed Measurement of Quantitative Proteomic Signatures in Mouse Lymphoma Models Using Magneto-Nanosensors.** *Theranostics*
Lee, J. R., Appelmann, I. n., Miething, C. n., Shultz, T. O., Ruderman, D. n., Kim, D. n., Mallick, P. n., Lowe, S. W., Wang, S. X.
2018; 8 (5): 1389-98
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2018; 2: 696-705
 - **Marrying Nanomagnetism with RNA Sequencing of Single Cancer Cells**
Wang, S. X., Ooi, C., IEEE
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