

Wenbo Ding

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https://scholar.google.com/citations?user=xo2FkgIAAAAJ&hl=zh-CN

EDUCATION

- Tsinghua University, P. R. China** 2011.08-2016.07
Ph.D., Electronic Engineering with **Excellent Graduate and Thesis Award**
Thesis: *The Research and Applications of Channel Estimation Based on Sparse Recovery*
Advisor: Prof. Jian Song, IEEE Fellow
- Tsinghua University, P. R. China** 2007.08-2011.07
B.Eng., Electronic Engineering with **Excellent Graduate and Thesis Award**
- University of Houston, USA** 2015.12-2016.03
Visiting Scholar, Electrical and Computing Engineering, Advisor: Prof. Zhu Han
- Imperial College London, UK** 2014.07-2014.09
Visiting Scholar, Electrical Electronic Engineering, Advisor: Dr. Wei Dai

EXPERIENCE

- Tsinghua-Berkeley Shenzhen Institute, Shenzhen** 2019.11-Present
Assistant Professor, PhD Supervisor, Principal Investigator
- Georgia Institute of Technology, USA** 2016.08-2019.10
Postdoctoral Fellow, School of Materials Science and Engineering
Advisor: Prof. Zhong Lin Wang, *Regents' Professor and Hightower Chair*

SELECTED HONORS AND AWARDS

- 2021 **National Early Career Award**
- 2020 IAS Residential Fellow, Loughborough University
- 2019 Natural Science Award (Second Prize), Institute of Electronics
- 2019 Gold Medal and Special Prize at the 47th International Exhibition of Inventions of Geneva
- 2016 Zijing Scholar Fellowship for Prospective Researcher, Tsinghua University
- 2016 Excellent Doctoral Dissertation of Tsinghua University (Top 1%)
- 2016 Excellent Ph.D. Graduate of Tsinghua University (Top 1%)
- 2016 Excellent PhD Graduate of Beijing City (Top 1%)
- 2015 Tsinghua Presidential Award for Graduate Student (Highest Honor, 10 out 24000)
- 2015 IEEE Scott Helt Memorial Award (Best Transactions Paper Award in IEEE BTS)
- 2015 Tsinghua Lin Feng Counsellor Prize (Highest honor for student mentor, 20 out of 1000)
- 2015 Academic Star of EE Department
- 2014 National Scholarship for Graduates
- 2011 Outstanding Undergraduate in Beijing

SELECTED PUBLICATIONS

Journals

1. Ziwu Song, Jihong Yin, Zihan Wang, Chengyue Lu, Ze Yang, Zihao Zhao, Zenan Lin, Jiyu Wang#, Changsheng Wu, Jia Cheng, Yuan Dai, Yunlong Zi, Shao-Lun Huang, Xinlei Chen, Jian Song, Gang Li, **Wenbo Ding**#. “A flexible triboelectric tactile sensor for simultaneous material and texture recognition,” *Nano Energy*, accepted.
2. Yang Luo, Zihan Wang, Jiyu Wang, Xiao Xiao, Qian Li, **Wenbo Ding**#, Hongyan Fu#. “Triboelectric Bending Sensor based Smart Glove towards Intuitive Multi-Dimensional Human-Machine Interfaces,” *Nano Energy*, vol. 89, 106330, Nov. 2021. **(Front Cover)**
3. Xiao Xiao, Xiao Xiao, Yihao Zhou, Xun Zhao, Guorui Chen, Zixiao Liu, Zihan Wang, Chengyue Lu, Menglei Hu, Ardo Nashalian, Sophia Shen, Kedi Xie, Weiwei Yang, Yongji Gong, **Wenbo Ding**, Peyman Servati, Chao Han, Shi Xue Dou, Weijie Li, and Jun Chen. “An ultrathin rechargeable solid-state zinc ion fiber battery for electronic textiles,” *Science Advances*, vol. 7, no. 49, eabl3742. **(Front Cover)**
4. Zihan Wang, Jiarong Li, Yuchao Jin, Jiyu Wang, Fang Yang, Gang Li, Xiaoyue Ni, **Wenbo Ding**#. “Sensing Beyond Itself: Multi-functional Use of Ubiquitous Signals towards Wearable Applications,” *Digital Signal Processing*, vol. 116, 103091, Sept. 2021.
5. Chengyue Lu, Zihan Wang, **Wenbo Ding**#, Gang Li, Sicong Liu, and Ling Cheng. “MARVEL: Multi Agent Reinforcement Learning for VANET Delay Minimization,” *China Communications*, accepted.
6. Jiarong Li, Changsheng Wu, Ishara Dharmasena, Xiaoyue Ni, Shao-Lun Huang, and **Wenbo Ding**#, “Triboelectric Nanogenerators Enabled Internet of Things: A Survey,” *Intelligent and Converged Networks*, vol.1, no. 2, pp. 115 - 141, Sept. 2020. (invited review)
7. Jianfeng Zhou, Fang Yang, Yuxiong Huang, **Wenbo Ding**#, and Xing Xie#, “Smartphone-powered efficient water disinfection at the point of use,” *npj Clean Water*, vol. 3, no. 40, 2020.
8. **Wenbo Ding**, Aurelia C. Wang, Changsheng Wu, Hengyu Guo, and Zhong Lin Wang, “Human- Machine Interfacing Enabled by Triboelectric Nanogenerators and Tribotronics,” *Advanced Materials technologies*, vol. 4, pp. 1800487, Jan. 2019.
9. **Wenbo Ding**, Changsheng Wu, Yunlong Zi, Haiyang Zou, Jiyu Wang, Jia Cheng, Aurelia C. Wang, and Zhong Lin Wang, “Self-Powered Wireless Optical Transmission of Mechanical Agitation Signals,” *Nano Energy*, vol. 47, pp. 566-572, May 2018.
10. **Wenbo Ding**, Jianfeng Zhou, Jia Cheng, Zhaozheng Wang, Hengyu Guo, Changsheng Wu, Sixing Xu, Zhiyi Wu, Xing Xie, and Zhong Lin Wang, “TriboPump: A Low-cost, Hand-powered Water Disinfection System,” *Advanced Energy Materials*, 2019, 1901320.
11. **Wenbo Ding**, Yang Lu, Fang Yang, Wei Dai, Pan Li, Sicong Liu, and Jian Song, “Spectrally Efficient Channel State Information Acquisition for Power Line Communications: A Bayesian Compressive Sensing Perspective,” *IEEE Journal of Selected Areas on Communications*, vol. 34, no. 7, pp. 2022-2032, Jul. 2016.
12. **Wenbo Ding**, Fang Yang, Sicong Liu, Xianbin Wang, and Jian Song, “Non-Orthogonal Time- Frequency Training Sequence Based CSI Acquisition for MIMO Systems,” *IEEE Transactions on Vehicular Technologies*, vol. 65, no. 7, pp. 5714-5719, Jul. 2016.
13. **Wenbo Ding**, Fang Yang, Sicong Liu, and Jian Song, “Structured Compressive Sensing-based Non-orthogonal Time-domain Training Channel State Information Acquisition for Multiple Input Multiple Output Systems,” *IET Communications*, vol. 10, no. 6, pp. 685-690, Apr. 2016.
14. **Wenbo Ding**, Fang Yang, Sicong Liu, and Jian Song, “Approach to Suppress Out-of-band Emission for Dual Pseudo Noise Padded Time-domain Synchronous-Orthogonal Frequency Division Multiplexing Systems,” *IET Communications*, vol. 9, no. 13, pp. 1606-1614, Sep. 2015.
15. Jian Song, **Wenbo Ding**, Fang Yang, Hui Yang, Bingyan Yu, and Hongming Zhang, “An Indoor Broadband Broadcasting System Based on PLC and VLC,” *IEEE Transactions on Broadcasting*, vol.61, no. 2, pp. 299-308, Jun. 2015.

16. **Wenbo Ding**+, Fang Yang, Hui Yang, Jintao Wang, Xiaofei Wang, Xun Zhang, and Jian Song, "A Hybrid Power Line and Visible Light Communication System for Indoor Hospital Applications," *Computers in Industry*, vol. 68, no. 4, pp. 170-178, Apr. 2015.
17. **Wenbo Ding**, Fang Yang, Wei Dai, and Jian Song, "Time-frequency Joint Sparse Channel Estimation for MIMO-OFDM Systems," *IEEE Communications Letters*, vol. 19, no. 1, pp. 58-61, Jan. 2015.
18. **Wenbo Ding**, Fang Yang, Jian Song, and Zhisheng Niu, "Energy-efficient Orthogonal Frequency Division Multiplexing Scheme Based on Time-frequency Joint Channel Estimation," *IET Communications*, vol. 8, no. 18, pp. 3406-3413, Dec. 2014.
19. **Wenbo Ding**, Fang Yang, Changyong Pan, Linglong Dai, and Jian Song, "Compressive Sensing Based Channel Estimation for OFDM Systems Under Long Delay Channels," *IEEE Transactions on Broadcasting*, vol. 60, no. 2, pp. 313-321, Jun. 2014. (**IEEE 2015 Scott Helt Memorial Award, Best Transactions Award**)
20. Jia Cheng*, **Wenbo Ding***, Yunlong Zi*, Yijia Lu, Linhong Ji, Fan Liu, Changsheng Wu, and Zhong Lin Wang, "Triboelectric Microplasma Powered by Mechanical Stimuli," *Nature Communications*, vol. 9, 3733, 2018.
21. Changsheng Wu*, **Wenbo Ding***, Ruiyuan Liu*, Jiyu Wang, Aurelia C. Wang, Jie Wang, Shengming Li, Yunlong Zi, and Zhong Lin Wang, "Keystroke Dynamics Enabled Authentication and Identification Using Triboelectric Nanogenerator Array," *Materials Today*, vol. 21, no. 3, pp. 216-222, Apr. 2018.
22. Kai Dong*, Jianan Deng*, **Wenbo Ding***, Aurelia C. Wang, Peihong Wang, Chaoyu Chen, Yi-Cheng Wang, Limin Jin, Bohong Gu, Baozhong Sun and Zhong Lin Wang, "Versatile Core-Sheath Yarn for Sustainable Biomechanical Energy Harvesting and Real-Time Human-Interactive Sensing," *Advanced Energy Materials*, vol. 8, pp. 1801114, Jun. 2018.
23. Zhiyi Wu*, **Wenbo Ding***, Yejing Dai*, Kai Dong, Changsheng Wu, Lei Zhang, Zhiming Lin, Jia Cheng, and Zhong Lin Wang, "Self-Powered Multifunctional Motion Sensor Enabled by Magnetic Regulated Triboelectric Nanogenerator," *ACS Nano*, vol. 12, no. 6, pp. 5726-5733, May 2018.
24. Jiyu Wang*, **Wenbo Ding***, Lun Pan*, Changsheng Wu, Hua Yu, Ruijin Liao, Lijun Yang, and Zhong Lin Wang, "Self-powered Wind Sensor System for Detecting Wind Speed and Direction Based on Triboelectric Nanogenerator," *ACS Nano*, vol. 12, no. 4, pp. 3954-3963, Mar. 2018.
25. Yunlong Zi*, Changsheng Wu*, **Wenbo Ding***, Xingfu Wang, Yejing Dai, Jia Cheng, Jiyu Wang, Zhengjun Wang, and Zhong Lin Wang, "Field Emission of Electrons Powered by a Triboelectric Nanogenerator," *Advanced Functional Materials*, vol. 28, pp. 1800610, Apr. 2018.
26. Peihong Wang*, Ruiyuan Liu*, **Wenbo Ding***, Peng Zhang, Lun Pan, Guozhang Dai, and Zhong Lin Wang, "Complementary Electromagnetic-triboelectric Active Sensor for Detecting Multiple Mechanical Triggering," *Advanced Functional Materials*, vol. 28, no. 11, pp. 1705808, Mar. 2018.
27. Hua Yu*, Xu He*, **Wenbo Ding***, Yongshan Hu, Congchen Yang, Shan Lu, Changsheng Wu, Haiyang Zou, Ruiyuan Liu, Canhui Lu, and Zhong Lin Wang, "A Self-Powered Dynamic Displacement Monitoring System based on Triboelectric Accelerometer," *Advanced Energy Materials*, vol. 7, no. 19, pp. 1700565, Oct. 2017.
28. Zhiyi Wu*, Hengyu Guo*, **Wenbo Ding***, Yi-Cheng Wang, Lei Zhang, and Zhong Lin Wang, "A Hybridized Triboelectric-Electromagnetic Water Wave Energy Harvester Based on a Magnetic Sphere," *ACS Nano*, vol. 13, no. 2, pp. 2349-2356, Jan. 2019
29. Sixing Xu*, **Wenbo Ding***, Hengyu Guo*, Xiaohong Wang, and Zhong Lin Wang, "Boost the Performance of Triboelectric Nanogenerators through Circuit Oscillation," *Advanced Energy Materials*, 2019, 1900772

Conferences

1. Oral Presentation, 2018 MRS Fall Meeting, Boston, MA, USA
2. Oral Presentation, 2018 MRS Spring Meeting, Phoenix, AZ, USA
3. **Wenbo Ding**, Fang Yang, Sicong Liu, and Jian Song, "Spectrally Efficient CSI Acquisition Approach for

Large-Scale MIMO Systems,” in Proc. IEEE GlobeCom 2015 Workshop, San Diego, USA.

4. **Wenbo Ding**, Yang Lu, Fang Yang, Wei Dai, and Jian Song, “Sparse Channel State Information Acquisition for Power Line Communications,” in Proc. IEEE ICC 2015, London, UK.
5. **Wenbo Ding**, Fang Yang, Chao Zhang, Linglong Dai, and Jian Song, “Simultaneous Time-frequency Channel Estimation Based on Compressive Sensing for OFDM System,” in Proc. IEEE GlobeCom 2014, Austin, USA.
6. Jian Song, **Wenbo Ding**, Fang Yang, Hui Yang, Jintao Wang, Xiaofei Wang, and Xun Zhang, “Indoor Hospital Communication Systems: a Hybrid Solution Based on Power Line and Visible Light Communication,” in Proc. IEEE Faible Tension Faible Consommation 2014, Monaco. (Invited)
7. **Wenbo Ding**, Fang Yang, and Jian Song, “Novel Approach to Shape the Spectrum for TDS-OFDM Systems with Cancellation Carriers,” in Proc. IEEE BMSB 2014, Beijing, China.
8. **Wenbo Ding**, Fang Yang, and Jian Song, “Out-of-band Power Suppression for TDS-OFDM Systems,” in Proc. IEEE BMSB 2013, London, UK.

Patents

1. **Wenbo Ding**, Zhong Lin Wang, Changsheng Wu, and Yunlong Zi, Self-Powered Wireless Optical Transmission of Mechanical Agitation Signals, US patent, 62643504.
2. Junnan Gao, Fang Yang, **Wenbo Ding**, and Jian Song, Visible Light Communication Method and Device Fusing OOK Modulation and OFDM Modulation, PCT.
3. 10 issued Chinese patents.

COMMUNITY SERVICE

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|-----------------|--|
| <i>Member</i> | ● MRS Member |
| | ● IEEE Member |
| | ● IEEE ComSoc Technical Committee on Power Line Communications |
| <i>Chair/PC</i> | ● Workshop Co-Chair, IEEE SmartGridComm 2019 |
| <i>Member</i> | ● Co-Chair, Ubicomp/ISWC’21 CPD Workshop |
| | ● TPC Member, IEEE SmartGridComm 2019, IEEE CIC/ICCC 2017/2018 |
| <i>Editor</i> | ● Associate Editor / Leading Guest Editor, Digital Signal Processing: A Review Journal |
| <i>Reviewer</i> | CVPR, Nano Energy, Nano Today, Sensors, IEEE Transactions on Signal Processing, IEEE Journal on Selected Areas in Communications, IEEE Transactions on Wireless Communications, IEEE Transactions on Communications, IEEE Transactions on Vehicular Technology, IEEE Transactions on Broadcasting, IEEE Communications Letters, IEEE Wireless Communications Letters, IEEE Access, IEEE Photonics Journal, Optics Express, Optics Communications, and etc. |

INVITED TALKS

1. Human-machine Interfacing based on triboelectric nanogenerators, Beijing Institute of Nanoenergy and Nanosystems, CAS, 2018/09/13.
2. Mechanical energy harvesting and sensing based on triboelectric nanogenerators, Department of Precision Instrument, Tsinghua University, 2018/09/05.
3. Mechanical energy harvesting and sensing based on triboelectric nanogenerators, Department of Electronic Engineering, Tsinghua University, 2018/08/23.
4. Mechanical energy harvesting and sensing based on triboelectric nanogenerators, Department of Electrical and Computer Engineering, University of Houston, 2018/04/13.
5. Mechanical energy harvesting and sensing based on triboelectric nanogenerators, Department of Electrical and Computer Engineering, Missouri University of Science and Technology, **IEEE sponsored presentation**, 2017/10/27.
6. Time-Frequency Joint Compressive Sensing in Communications, Department of Electrical and Computer Engineering, University of Houston, 2016/01/15.

7. Non-Intrusive Power Line Quality Monitoring Based on Power Line Communications, Department of Electrical and Electronic Engineering, Imperial College London, 2014/07/28.

TEACHING AND MENTORING

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|-----------------------|---|
| <i>Lecturer</i> | <ul style="list-style-type: none">● <i>Advanced Signal Processing</i>, Graduate, Tsinghua Univ., Spring.● <i>Self-powered Systems</i>, Graduate, Tsinghua Univ., Fall. |
| <i>Guest Lecturer</i> | <ul style="list-style-type: none">● <i>Energy and Resource Recovery</i>, Undergraduate, Georgia Tech, 2018 Fall.● <i>Statics</i>, Core Course for Undergraduate, Georgia Tech, 2018 Fall |
| <i>Mentor</i> | <ul style="list-style-type: none">● <i>Undergraduate Mentoring Program</i>, Tsinghua Univ., 2011-2015 |