Fan Wang

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Summary

I am an aspiring master student working on multi-disciplinary projects at the intersection of mechanical engineering, materials science and biology. Currently, I am creating new self-powered paradigms for Electro-tactile neural interfacing and wearable electronic with skin-like bioelectronic and Triboelectric Nanogenerator (TENG).

Research Interests

TENG, Biosensor, Miro/Nano-robotic, Soft Robotics, Wearable Electronics, Flexible Electronics, Microfluidics, Bioinspired Intelligent Nanostructured Materials, Electrospinning, Neuroengineering.

Education

09/2018-07/2021 University of Chinese Academic of Science (UCAS)| Concentration: **Nanogenerator**
Degree: Master of Engineering, *GPA 3.65/4.0*

09/2016-07/2018 University of Science & Technology Beijing (USTB)| Concentration: **Robotics**

09/2014-07/2018 Beijing Information & Science Technology University(BISTU)
Major in **Mechanical Engineering**; Minor in **Intelligent Robotic Technology**
Degree: Bachelor of Engineering, *GPA 3.05/4.0*

Research Experience

08/2020- **Soft Bioelectronics Materials in Neural Interfacing based on TENG |Leader**

01/2020- **High Current Output of TENGs and Management toward Self-powered Systems |Leader**

06/2019-02/2020 **Self-powered Electro-tactile Interface for Experiencing Tactile Virtual Reality |Leader**

07/2018-09/2019 **Self-powered Wearable Sensor for Identifying Noncontact Motions |Leader**

- Inspired by the cockroach antennae and designed a bionic-antennae-array sensor

12/2018-09/2019 **Directing Visualization of Temperature Change during TENG Operation** | Membership

- Used a thermochromic material to visualize temperature changes with varied color

04/2018-08/2018 **Environmental Energy Harvesting in Different Weather Conditions** | Membership

- Designed integrated TENG array to collect energy from both wind and rain drops.

12/2017-06/2018 **The Program of Rehabilitation Robot** |Leader

10/2016-01/2017 **The Program of Path Planning of Soccer Robot** |Leader

10/2014-10/2017 **The Program of Full Autonomous Intelligence Middle-size Soccer Robot for Middle- Size League in Robot World Cup** |Membership

10/2015-10/2016 **Intelligent Wheelchair controlled by Brain Wave** |Membership

09/2014-06/2015 **Quad Rotor Unmanned Aerial Vehicle** |Membership

Publication

[1] **Wang, F.**; Ren, Z.; Nie, J.; Tian, J.; Ding, Y.; Chen, X., Self-Powered Sensor Based on Bionic Antennae Arrays and Triboelectric Nanogenerator for Identifying Noncontact Motions. **Advanced Materials Technologies** 2019, 1900789.

[2] **Wang, F.#** ; Shi, Y.#; Nie, J.; Tian, J.; Ding, Y.; Chen, X.; Wang, Z. L., Self-powered Electro-tactile Sensation for Experience of Tactile Virtual Reality. **Nature Electronics** 2020, NATELECTRON-20062931 (In Peer Review)

[3] Li, S; Nei, J.; Shi, Y.; Tao, X.; **Wang, F.**; Tian, J.; Lin, S.;Chen, X.;Wang, Z.L., The contribution of different functional groups to the contact electrification of polymers. **Advanced Materials** 2020, 202001307.1.

[4] Zhong, W.; Xu, L.; Zhan, F.; Wang, H.; **Wang, F.**; Wang, Z. L., Dripping Channel Based Liquid Triboelectric Nanogenerators for Energy Harvesting and Sensing. **ACS Nano** 2020, https://dx.doi.org/10.1021/acsnano.0c04413

[5] Lei, R; She, Y. X.; Ding, Y. F.; Nie, J. H.; Li, S. Y.; **Wang, F.**; Zhai, H.; Chen, X. Y.; Wang, Z.L., Sustainable High Voltage Source based on Triboelectric Nanogenerator with Charge Accumulation Strategy. **Energy & Environmental Science** 2020, EE-ART-04-2020-001236.

[6] Lin, Y.;Nie, J.;Bai, Y.;Li, S.;Xu, L.; **Wang, F.**;Ding, Y.;Tian, J.;Li, Y.;Chen, X.;Shen, H.,Anodic bonding driven by the pulse current signal of triboelectric nanogenerator. **Nano Energy** 2020,73, 104759

[7] Ren, Z.; Ding, Y.; Nie, J.; **Wang, F.**; Xu, L.; Lin, S.; Chen, X.; Wang, Z. L., Environmental Energy Harvesting Adapting to Different Weather Conditions and Self-Powered Vapor Sensor Based on Humidity-Responsive Triboelectric Nanogenerators. **ACS Appl Mater Interfaces** 2019, 11 (6), 6143-6153.

[8] Ding, Y.; Shi, Y.; Nie, J.; Ren, Z.; Li, S.; **Wang, F.**; Tian, J.; Chen, X.; Wang, Z. L., Thermochromic triboelectric nanogenerator enabling direct visualization of temperature change during operation. **Chemical Engineering Journal** 2020, 388.

[9] **Wang, F.**, An Efficient Twin-Turbine Structure Triboelectric Nanogenerator for Harvesting Arbitrary Water Wave Energy. The 4th International Conference on Nanoenergy and Nanosystems 2019, Beijing, June 15-17,2019[C].

[10] **Wang, F**.; Chen, X., Mechanical Structure Design of Rehabilitation Robot.2018. (Undergraduate)

[11] **Wang, F.**; Han, Y. F., Path Planning of Soccer Robot based Robot Operating System (ROS). (Undergraduate)

[12] **Wang, F.**; Zhao, T., The Manufacture and Design of 3D Printing. (Undergraduate)

[13] Wang, Z. L., Chen, X. Y., **Wang, F.**, Self-Powered Sensor Based on Bionic Antennae Arrays and Triboelectric Nanogenerator for Identifying Noncontact Motions (Applying for Patent)

[14] Wang, Z. L., Chen, X. Y., **Wang, F.**, Self-storing and Self-release Energy Management Circuit for Triboelectric Nanogenerators (Applying for Patent)

Working Experience

06/2017-08/2017 **Horizon Robotics in Beijing| Internship**

- Debugged and managed the Robotic vision analysis data

10/2018-07/2019 **Teaching Assistant** of Prof. **Wang Weitian** for Chinese Calligraphy Class

Honors and Distinctions

10/2019 **2019 National Scholarship for Graduate Students** (Merit-based)

07/2019 Holder of Third Prize of 2019 UCAS Innovation and Entrepreneurship Training Competition

05/2019 **The Poster of the 4th International Conference on Nanoenergy and Nanosystems 2019**

06/2018 Outstanding Graduates Awards in BISTU in 2018th (Merit-based)

06/2018 Holder of Second Prized of Photography Competition of BISTU

10/2017 Holder of **First Prize LabView Programming Contest of BISTU**

03/2017 Holder of Second Prize of Beijing University Technology Innovation Project

07/2017 **Champion of RoboCup Middle Size League Nagoya, Japan**

06/2016 Holder of Third Prize of China Undergraduate Mathematical Contest in Modeling

12/2015 **Special Award of North China Five Robots Competition**

Technical Skills

Fabrication and Characterization:

Fabrication: **ICP, PVD, Laser direct writing, PECVD** Ceradrop, **SonoPlot**.

Microscopy: **SEM, AFM, Confocal Microscopy**, TEM.

Electrical Characterization: Cascade, UItraFIex, **KEITHLEY 6514/2450**

Optical Characterization: **UV-Vis**, XRD, **Raman and PL -Horiba**, Ellipsometry.

Software Skills:

Programming: C/C++, Python, **Matlab, LabView, PLC**

Open-Source: **Git, Paraview,** MSTM.

OS: Unix, **Ubuntu,** Windows, macOS.

Software Applications: **COMSOL, Mathematic, WolframAlpha,** Jade, 3DMax, Solidworks, SEMulator 3D.

Hardware Skills:

Prototyping and PCB: Eagle.

Machinofacture: **Numerical Control Tools.**

MCUs and MPUs: **Arduino,** Raspberry Pi，**MSP430 , Nordic nRF,** BLE Bluetooth &Wi-Fi.