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, and like working on hands-on laboratory experiments with the desire to try out many novel ideas. 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, Microfluidics, Liquid Metal, Wearable Electronics, 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 3.56/4.0***

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 80.2/100***

Research Experience

11/2020 - **Bioinspired soft micro-robot with environmental camouflage colors** |Leader

09/2020 - **Liquid metal–enabled cybernetic electronics based on TENG** |Leader

01/2020-11/2020 **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

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

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

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

Publications and Patents

[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*** 2020, 5, 1900789.

[2] **Wang, F.**; Tian, J.; Ding, Y.; Chen, X.; Wang, Z. L., Self-powered Electro-tactile Sensation for Experience of Tactile Virtual Reality. ***Advanced Energy Materials*** (In Peer Review).

[3] Shi, Y.#; **Wang, F.#**; Tian, J.; Ding, Y.; Chen, X.; Wang, Z. L., Self-powered Electro-tactile Sensation for Experience of Tactile Virtual Reality. ***Science Advance*** (In Peer Review).

[4] 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.

[5] 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, 4 (8), 10510-10517.

[6] 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, 13, 2178-2190.

[7] 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.

[8] 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.

[9] 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.

[10] **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].

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

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

[14] Wang, Z. L., Chen, X. Y., **Wang, F.**, A universal managing circuit for improving current of Triboelectric Nanogenerator (Applying for Chinese Patent)

[15] Wang, Z. L., Chen, X. Y., **Wang, F.**, Self-powered Electro-tactile System Device (Applying for Chinese Patent)

Working Experience

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

- Debugged and managed the Robotic vision analysis data

Honors and Distinctions

10/2020 **Director Excellence Scholarship**
10/2020 **2020 National Scholarship for Graduate Students** (Merit-based)
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**
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**, **SonoPlot**.
Microscopy: **SEM, AFM, Confocal Microscopy**, TEM.
Electrical Characterization: Cascade, UltraFIex, **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.