# Chenyu WEN PhD, Tenure-track Assistant Professor

Division of Solid-State Electronics, Department of Electrical Engineering
**Uppsala University**, Uppsala, Sweden.

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## Education

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| 2015.09 - 2019.09 | **Doctor of Philosophy**<br>Division of Solid-State Electronics, Dept. Engineering Sciences, Uppsala University, Sweden<br>Thesis: *Solid-State Nanopores for Sensing - From Theory to Applications* |
| 2012.09 - 2018.01 | **Doctor of Natural Science**<br>School of Microelectronics, Fudan University, China<br>Thesis: *Semiconductor Gas Sensors Based on Surface Adsorption Process* |
| 2008.09 - 2012.06 | **Bachelor of Engineering**<br>Chen-Shiung Wu Honor College, Southeast University, China<br>Major: *Electronic Science and Technology* |

## Employment

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| 2024.05 – present | **Tenure-track Assistant Professor**<br>Solid-State Electronics, Electrical Engineering, **Uppsala University**, Sweden |
| 2024.01 – 2024.04 | **Postdoctoral Researcher**<br>Dept. of Bionanoscience, **Delft University of Technology**, the Netherlands. |
| 2021.10 – 2023.12 | **Joint Postdoctoral Researcher**<br>1. Dept. of Bionanoscience, **Delft University of Technology**, the Netherlands.<br>2. Dept. of Biophysics, Agrotechnology & Food Sciences, **Wageningen University**, the Netherlands |
| 2019.10 – 2021.10 | **Postdoctoral Researcher**<br>Solid-State Electronics, Electrical Engineering, **Uppsala University**, Sweden |

## Grants and Awards

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| VR<br>2025-05333 | Vetenskapsrådet, 2026.01 – 2029.12<br>**Starting Grant 2025 (PI)**<br>Project: *An Integrated NEOtrap-ISFET Single Molecular Sensor for Protein Dynamics*<br>Total 4,800,000 SEK. Funding for individual |
| Mag. Bergvalls Stiftelse 2025-233 | Magnus Bergvalls Stiftelse, 2026.02 – 2027.02<br>**Research Grant 2025 (PI)**<br>Project: *Hydraulic pressure enables efficiency enhancement of nanopore power generators*<br>Total 75,000 SEK. Funding for individual |
| 237679 | NordForsk, 2026.03 – 2029.03<br>**Research networks within natural sci. & related engineering fields (network leader, PI)**<br>*The Junior Researcher Network in Brain Integrated Neuromorphic Tech. for Biomedical Appl.*<br>Total 1,964,506 NOK. Network funding with four parties. |
| Göran Gustafsson Stiftelser | Göran Gustafsson Stiftelser, 2026.05 – 2027.05<br>**1-year pris 2026 UU Fysik (PI)**<br>Hydraulic Pressure in Nanofluidics: from Theorical Models to New Practical Control Methods in Nanofluidic Devices<br>Total 1,250,000 SEK. Funding for individual |

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| 2024-05852 | Vinnova, 2026-03 – 2026-09<br>**Verifiering för tillväxt, VFT 2026 (PI)**<br>Total 150,000 SEK |
| 2025-01360 | Vinnova, 2026-06 – 2026-11<br>**Planeringsbidrag inför internationell ansökan 2026 (PI)**<br>Total 496,448 SEK |
| 2024-2027 | **Tenure-track Assistant Professor Starting package for running cost (PI)**<br>Total: 350,000 SEK/yr. Funding for individual |
| VR<br>2020-00296* | Vetenskapsrådet, 2020.07 – 2023.06<br>**International Postdoc 2020 (PI)**<br>Project: *TIMPANI – Transport of Ions and Molecules in Nanoscale Channels for Protein Analysis*<br>Total 3,150,000 SEK. Funding for individual |
| KAW<br>2019-0527* | Knut and Alice Wallenberg Foundation, 2020.03 –2022.03<br>**Postdoctoral studies at Massachusetts Institute of Technology (PI)**<br>Project: *Study of Ion/Molecule Transport in Nanoscale Channels for Protein Nanopore Profiling*<br>Total 115,408 USD. Funding for individual |
| 2018 VT | **C.F. Liljewalchs stipendiestiftelse**, 2018.06 – 2019.06<br>Travel grant. 15,000 SEK |
| 2025 | Outstanding Reviewer for RSC Applied Interfaces 2025.<br>https://www.rsc.org/standards-and-recognition/outstanding-peer-reviewers/rsc-applied-interfaces-outstanding-peer-reviewers |
| 2022 | American Chemical Society (ACS) publications peer reviewer recognition & appreciation 2022 |
| 2011 | First prize in National Undergraduate Electronic Design Contest (top 5 of >10,000 teams)<br>Ministry of Education, Ministry of Industry and Information Technology of the P. R. China |

## Teaching and Supervision

### Pedagogic Courses and training

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| 2025-2026 | **TUR** (Teknisk-naturvetenskapliga fakultetens universitetspedagogiska råd) **Mentorship Programme**<br>Mentor: Andreas Solders, Lecturer/Associate Professor at Department of Physics and Astronomy; Applied Nuclear Physics, UU |
| 2025 Spring | **Supervising Doctoral Students** (3 workweeks) **at Uppsala University**<br>Qualified by the Division for Quality Enhancement, Academic Teaching and Learning, UU |
| 2025 Spring | **Supervising Students for Degree Projects** (2 workweeks) **at Uppsala University**<br>Qualified by the Division for Quality Enhancement, Academic teaching & learning, UU |
| 2020 Autumn | **Supervisor Training Course within the Faculty of Science and Technology at Uppsala Univ.**<br>Working hours equivalent to two days of full-time training |
| 2018 Autumn | **Academic Teacher Training Course** (5 workweeks, 7.5 credits) **at Uppsala Univ.**<br>Qualified by the Division for Quality Enhancement, Academic teaching & learning |

### Pedagogical Funding

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| TEKNAT 2024/158 | Faculty of Teknisk-naturvetenskapliga, Uppsala University<br>**Funds for faculty-wide courses at the doctoral level in 2025**<br>Course: *Characterization Techniques for Semiconductor Materials and Devices*<br>Total: 200,000 SEK. Funding for individual |

* These projects were planned to be implemented at MIT in the US, but did not occur due to the pandemic.

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| TEKNAT 2025/108 | Faculty of Teknisk-naturvetenskapliga, Uppsala University<br>**Fakultetens fond för pedagogisk förnyelse TUFF 2026**<br>Early Assessment for Better Learning: Diagnostic Testing for Master's Students<br>Total: 200,000 SEK. PI: Irina Temiz, Co-PI. |

**Teaching Experience**

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| 2025.03-2025.06<br>2026.03-2026.06 | **Signals and systems 1TE661** (Uppsala University)<br>5 credits for 2nd year undergraduates (first cycle studies)<br>Course Responsible Teacher<br>Lectures: 9 (18 hours) = 9/13 of total lectures<br>Excises: 1 (2 hours) = 1/12 of total excise classes<br>Mini-project: introduction and oral exam<br>Final exam: question design and marking<br>Number of students: 86 (2025) 108 (2026) |
| 2025.09-2025.10 | **Digitalteknik och elektronik 1TE717** (Uppsala University)<br>10 credits for 3rd year undergraduates (first cycle studies)<br>Lectures: 4 (8 hours) = 4/13 of total lectures<br>Excises: 4 (8 hours) = 4/12 of total excise classes<br>Final exam: question design and marking<br>Number of students: 84 |
| 2026.03-2026.04 | **Characterization Techniques for Semiconductor Materials and Devices FTN0655** (Uppsala University)<br>5 credits for PhD students<br>Course Responsible Teacher<br>Lectures: 2 (4 hours) = 2/8 of total lectures<br>Labs: 1 (4 hours) = 1/3 of total labs<br>Number of students: 3 |
| 2025.04-2025.06 | **Neuromorphic Computing and Engineering FTN0652** (Uppsala University)<br>4 credits for PhD students (third cycle studies)<br>Seminar: 3 (6 hours) = 3/4 of total seminars<br>Number of students: 4 |
| 2024.11-2024.12 | **Electrical Characterization of Semiconductor Components FTN0619** (Uppsala University)<br>5 credits for PhD students<br>Course Responsible Teacher<br>Lectures: 2 (4 hours) = 2/8 of total lectures<br>Labs: 2 (4 hours) = 2/4 of total labs<br>Number of students: 6 |
| 2022.11 - 2022.12 | **Introductory Physics** (Wageningen University)<br>6 credits, for 1st year undergraduates<br>Lab assistant: 6×2 labs = 24 hours<br>Number of students: 196 |
| 2021.09 - 2021.10 | **Brain Inspired Computing FTN0200** (Uppsala University)<br>5 credits for PhD students<br>Lectures: 2 (4 hours) = 2/9 of total lectures<br>Number of attendees: 15 |
| 2020.08 | **Introduction to Neuromorphic Computing** (Uppsala University)<br>2 credits, open course for researchers, engineers, and PhD students<br>Lectures: 1 (2 hours) = 1/5 of total lectures<br>Number of attendees: ~25 |
| 2020.11 - 2020.12 | **Introduction to Brain-Inspired Computing** (Uppsala University)<br>open web course for the general public<br>Lectures: 2 (4 hours) = 2/8 of total lectures<br>Number of attendees: 38 (10 from university and 28 from public) |
| Every fall semester 2016-2019, **4** times in total | **Electronics I 1TE624** (Uppsala University)<br>5 credits, for 1st year undergraduates (first cycle studies)<br>Lab assistant: 4×3 labs = 48 hours/semester<br>Number of students: ~100 every year |

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| Every fall semester 2015-2019, **5** times in total | **Analog Electronics 1TE725** (Uppsala University)<br>5 credits for 3rd year undergraduates (first cycle studies)<br>Lab assistant: 5×3 labs = 60 hours/semester<br>Excise classes: 2 exercises = 4 hours/semester<br>Number of students: 103 (2015), 104 (2016), 113 (2017), 96 (2018), 75 (2019)<br>Assessment score: 3.8/5 (2015), 4.1/5 (2016), 4.4/5 (2017), 4.3/5 (2018), 3.9/5 (2019) |

### Supervising Experience

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| 2025.03 – present | **PhD student, Main supervisor:** *Ionic neuromorphic devices and circuits for next-generation computing.*<br>Student: Zhiwei Li (Uppsala University) |
| 2025.01- present | **Master project:** *Machine learning algorithm for signal processing.*<br>Student: Xingdi Tong, M.Sc. (Uppsala University) |
| 2025.09 – present | **Master project:** *Realization of Spike Neuron Network by using FPGA.*<br>Student: Xiangyi Shen, M.Sc. (Uppsala University) |
| 2026.01- present | **Bachelor thesis project:** Neuromorphic electronics for functional modules<br>Student: Haze Newman, B.Sc. (Uppsala University) |
| 2026.03 - present | **Bachelor thesis project**, *Neuromorphic audio system*<br>Students: Erik Martinsson, Pauline Larsson-Sten Thuresson, and Theodor Thuresson, B.Sc. (Uppsala University) |
| 2025.10 – 2026.01 | **Practical course project (Applied Physics):** *Solid-state nanopore for biomolecule sensing*<br>Students: Thor Chumakonde and Ellen Gottberg, M.Sc. (Uppsala University) |
| 2025.01- 2025.06 | **Master thesis project:** *Neuromorphic circuits design.*<br>Student: Pouya Ahmadi, M.Sc. (Uppsala University)<br>Results: defense passed |
| 2024.11-2025.01 | **Practical course project (Applied Physics):** *Silicon neurons and synapses: electronic circuit design, simulation, and realization*<br>Students: Sigfrid Nevrell, Viktor Westberg, M.Sc. (Uppsala University)<br>Results: course passed |
| 2023.04 - 2023.08 | **Master internship project**: *Protein reorganization from Nanopore ElectroOsmotic Trap signal*<br>Jeroen P. Smaak, M.Sc. (Delft University of Technology)<br>Results: defense passed, grade: 9/10, distinguished. |
| 2022.09 - 2023.03 | **Master end project (MEP)**: *Dynamics of protein Hsp90 by Nanopore ElectroOsmotic Trap*<br>Student: Hugo Maurer, M.Sc., (Wageningen University)<br>Results: defense passed, grade 8.5/10, excellent. |
| 2022.04 - 2022.07 | **Bachelor end project (BEP)**: *Nanopore ElectroOsmotic Trap for protein dynamic*<br>Student: Thomas Smit, B.Sc. (Delft University of Technology)<br>Results: defense passed, grade: 9/10, distinguished. |
| 2017.03 - 2017.06 | **Practical course project**: *Weak current signal amplification system for nanopore application*<br>Student: Erik Klavebäck, B.Sc. (Uppsala University)<br>Results: course passed |

### Appointments/board participation

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| 2026.02 | **Unga Forskare, Utställningen Unga Forskare:** competition reviewer. Reviewed 3 projects. |
| 2026.06 | **Subject reader of bachelor thesis projects:** Jesper Hägglund, Evelyn Persson |
| 2026.06 | **PhD defense committee member:** Fabio De Ferrari from KTH |

## Leadership and Administration

### Training and Courses

2024.11 **Curious About Leadership** (2 workdays) **at Uppsala University**
Authorized by Career and Leadership in Academia, Uppsala University.

2024.10 **Ekonomispelet for Researchers and Research Leaders** (1 workday) **at Uppsala University**
Authorized by Career and Leadership Development Centre, Division for Quality Enhancement, Uppsala University.

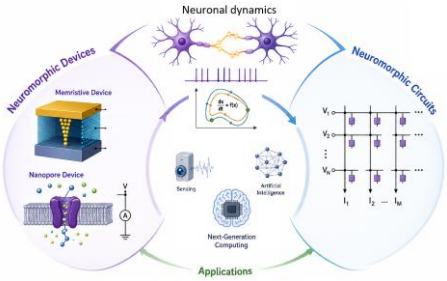
2024.09 **Workshop: How to Build a Support Network** (half workday)
Offered by PostdocTraining Organization

### Student Administration Experience

2025.01 - present **Vägledare for master students in the program of Renewable Electricity Production**

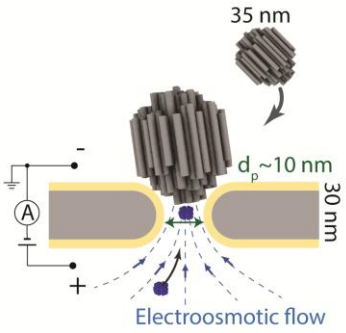
## Research Experience

1. **Neuromorphic devices and circuits** 2024.5 - present



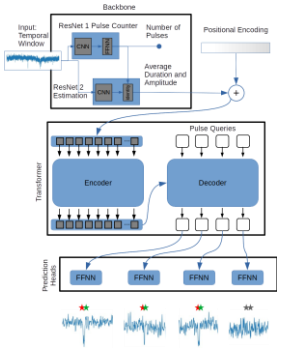

My team focus on the development of neuromorphic devices and circuits that emulate the dynamics of biological neural systems for efficient information processing. By integrating nanoscale device engineering with circuit-level design, we aim to realize hardware platforms capable of adaptive learning, stochastic computation, and energy-efficient signal processing. In particular, we explore emerging devices, such as memristive elements and nanopore-based systems, to capture rich temporal dynamics and probabilistic behaviors, bridging the gap between physical device physics and computational neuroscience. This work contributes to advancing next-generation computing architectures for applications in sensing, artificial intelligence, and single-molecule signal analysis.

2. **NEOtrap for protein dynamics** 2021.10 – present




Nanopore electro-Osmotic trap (NEOtrap) is an emerging technology for dynamics studies of single biomolecules. For a nanopore, an electroosmotic flow (EOF) can be generated by docking a DNA origami sphere under an electrical bias. This EOF leads to attraction and subsequent trapping of target molecules in the pore. Protein dynamics cause fluctuations in the ionic current flowing through the nanopore/DNA sphere structure. We have succeeded in prolonging the trapping time by ~100× via involving cholesterol anchors on the DNA origami sphere, which offers much longer observation time for small proteins critical for dynamics studies. The orientation of the docked origami sphere can be further controlled. By analyzing the mechanisms, we have revealed that the vertical configuration of the origami can generate stronger EOF indicating a more stable trapping. We have also scrutinized the physics of NEOtrap, including capture, trapping, and escape, by the construction of a set of models, and verified using dCas9 complexes. Moreover, the dynamics of dCas9 binding DNA double helix have been investigated upon its capture by NEOtrap.

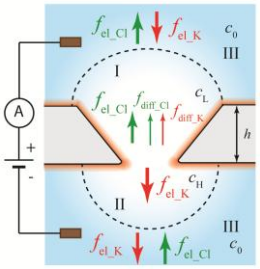
3. **Machined learning for spike single processing** 2019.09 – present



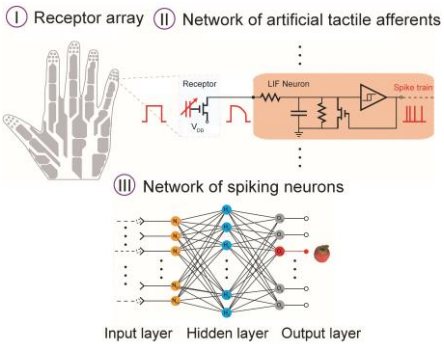

Spike signals are common in neural systems, nanopore sensing, single-molecule Förster resonance energy transfer, etc. However, the recognition of spike signals from the background noise and subsequent feature extraction of these spikes are always a challenge. We have used machine learning methods to meet this challenge. Our first solution to this challenge involves the invention of a two-branch ResNet neural network. It can achieve automated spike recognition and feature extraction for poor quality signals with the signal-to-noise ratio ~1. Our second solution implements the Transformer structure (the very structure used in ChartGPT) to develop a generalized spike

detection algorithm. Our studies in this field have resulted in a review paper.

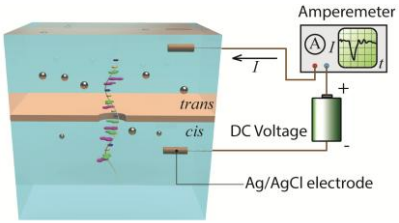
4. **Ion transport in nanoconfinement** 2018.01 – present
   Analytical models and numerical simulations on the electrokinetics and electro-hydrodynamic in nanopores/nanochannels. 1. Model for ion concentration polarization induced ionic rectification; 2. Induced charged effects in nanopores; 3. Ionic current blockage by analyte translocation through nanopores; 4. Dynamics of translocating molecules under electrophoretic and electroosmotic forces.



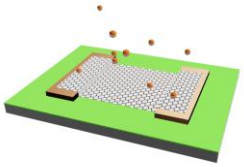
5. **Neural network based tactile sensor array** 2018.01 – present
   We have designed and fabricated triboelectric tactile sensor arrays with the neural network architecture for future artificial skin. The neural network endows the sensor array with a nature of in-sensor processing, which synthesizes signals during propagation hierarchically and enables a large scale with deep perception. Lately, we have expanded the scale of sensor array over a finger to a palm, designed the neural circuits, and implemented the signal multiplexing and acquisition platform with 1024 branches. The latter has been achieved based on multiplexers, FPGA, and LabView. This advanced system allows us to interpret the spike timing information and utilize for object recognition by an artificial neural network algorithm.




6. **Solid-state nanopore sensing** 2015.09 – present
   **Theory**: 1. A generalized resistance model for various shapes of nanopores; 2. A noise model of solid-state nanopores; 3. A system-level model of signal and noise properties of DNA translocation; 4. Theoretical interpretation, based on physical-phenomenological models, of DNA-nanopore interaction and clogging.
   **Experiment:** 1. Standardized procedures for sensing experiment and data processing; 2. Translocation kinetics of proteins through nanopores; 3. Autogenic translocation of analytes driven by transmembrane concentration gradient; 4. Group behaviors of nanoparticles translocating multiple pores; 5. An individually addressable nanopore array via a smart combined electrical-fluidic multiplexing approach; 6. Dynamics of lipid bilayer coating in nanopores; 7. Bowl-shape nanopore design, fabrication, and strongly rectified DNA translocation.




7. **Gas sensors and machine learning algorithms** 2012.09 – present
   A physical-phenomenological model of adsorption process on 2D materials; Humidity sensors with ultra-fast response (< 0.1 s) and applications in breath monitor.



## Publication List (Citation 1589; h-index 21, per Feb 2026)

* These authors contributed equally to this work. # Corresponding authors.

### Year 2026


1. M. Jiao, L. Duan#, J. Zhang, W. Peng, **C. Wen**#. High-Precision Multi-gas Detection Based on Pd–Au Bimetallic Decorated ZnO Gas Sensors and PSO Feature Optimization. *ACS Applied Electronic Materials*, **2026**, 8, 7, 3218–3228. https://doi.org/10.1021/acsaelm.6c00259
2. R. Guo, R. Li, J. Ding, L. Wen, Y. Zhang#, **C. Wen**#, M. Jiao#. Neural Network for Gas Recognition Based on

MOS Electronic Nose: Algorithm Design and Hardware Deployment. *Microchemical Journal*, **2026**, 225, 118008. https://doi.org/10.1016/j.microc.2026.118008

3. M. Jiao, X. Chen#, B. Deng, K. Mao, **C. Wen**#. Multi-gas recognition based on ZnO–Au–SnO2 heterostructure gas sensors and one-dimensional convolutional neural networks. *Talanta*, **2026**, 307, 129904. https://doi.org/10.1016/j.talanta.2026.129904
4. N. H. Pham,* **C. Wen**,* M. H. Khaksaran, W.-Y. Lee, J. Cruz, K. Hjört, D. Wu, S.-L. Zhang. Planar Solid-State Nanopores toward Scalable Nanofluidic Integration Based on CMOS Technology. *Advanced Engineering Materials*, **2026**, e202501868. https://doi.org/10.1002/adem.202501868
5. Z. Li, S.-L. Zhang, **C. Wen**#. Bifurcation Analysis Framework of Spiking Neuron Models. *arXiv preprint*, arXiv:2601.02116, **2026**.
6. X. Tong, **C. Wen**#. Denoise Stepwise Signals by Diffusion Model Based Approach. *arXiv preprint*, arXiv:2602.08904, **2026**.
7. M. Jiao, H. Dong#, Y. Qiao, R. Guo, C. M. Hung, N. Van Duy, N. Duc Hoa, **C. Wen**#. Accurate Methane Detection in Combustible Gas Mixtures by Using $SnO_2$-Ag-ZnO Gas Sensors with Rapid Responses. *ACS Sensors*, **2026**, 11, 1, 290–298. https://doi.org/10.1021/acssensors.5c02966.

**Year 2024**

8. **C. Wen**, S. Schmid, C. Dekker. Understanding Electrophoresis and Electroosmosis in Nanopore Sensing with the help of the Nanopore Electro-Osmotic trap. *ACS Nano*, **2024**, 18, 31, 20449–20458.
9. W.-Y. Lee,* **C. Wen**,* N. H. Pham, M. H. Khaksaran, S.-K. Lee, S.-L. Zhang. Brownian motion paving the way for molecular translocation in nanopores. *Small Methods*, **2024**, 2400042.
10. L. Chen, S. Karilanova, S. Chaki, **C. Wen**, L. Wang, B. Winblad, S.-L. Zhang, A. Özçelikkale, Z.-B. Zhang, Spike-timing based coding in neuromimetic tactile systems yields dynamic object classification, *Science*, **2024**, 384, 660-665.
11. X. Chen*, J. W. van de Sande*, J. Ritmejeris*, **C. Wen**, H. Brinkerhoff, A. H. Laszlo, B. Albada, C. Dekker. Resolving Sulfation Posttranslational Modifications on a Peptide Hormone using Nanopores. *ACS Nano*, **2024**, 18, 42, 28999–29007.

**Year 2023**

12. **C. Wen**, E. Bertosin, X. Shi, C. Dekker, S. Schmid. Orientation-locked DNA origami for stable trapping of small proteins in the NEOtrap. *Nano Letters*, **2023**, 23, 3, 788-794.

**Year 2022**

13. D. Dematties*, **C. Wen***, S.-L. Zhang A generalized transformer-based pulse detection algorithm. *ACS Sensors*, **2022**, 7, 2710−2720.
14. S. Li, S. Zeng, **C. Wen**, Z. Zhang, K. Hjort, S.-L. Zhang. Docking and Activity of DNA Polymerase on Solid-State Nanopores. *ACS Sensors*. **2022**, 7(5), 1476–1483.
15. Y. Han*, L. Sun*, **C. Wen**, Z. Wang, J. Dai, L. Shi. Flexible Conductive Silk-PPy Hydrogel toward Wearable Electronic Strain Sensors. *Biomedical Materials*, **2022**, 17(2), 024107.

**Year 2021**

16. **C. Wen**, S.-L. Zhang. On blockage current by object translocation through nanopores. *Journal of Applied Physics*. **2021**, 129, 064702.
17. **C. Wen**, S.-L. Zhang. Fundamentals and Potentials of Solid-state Nanopores: A Review. *Journal of Physics D: Applied Physics*. **2021**, 54, 2, 023001.
18. **C. Wen**, D. Dematties, S.-L. Zhang, A guide to signal processing algorithms for nanopore sensors. *ACS Sensors*, **2021**, 6, 3536-3555.
19. D. Dematties*, **C. Wen***, M. D. Pérez, D. Zhou, S.-L. Zhang, Deep learning of nanopore sensing signals using a bi-path network. *ACS Nano*, **2021**, 15, 14419-14429.
20. N. H. Pham*, Y. Yao*, **C. Wen***, S. Li, S. Zeng, T. Nyberg, T. T. Tran, D. Primetzhofer, Z. Zhang, S.-L. Zhang. Self-Limited Formation of Bowl-Shaped Nanopores for Directional DNA Translocation. *ACS Nano*, **2021**, 15, 11, 17938–17946.
21. L. Chen, **C. Wen**, Z. L. Wang, S.-L. Zhang, Z.-B. Zhang, Artificial tactile peripheral nervous system supported by self-power transducers. *Nano Energy*, **2021**, 82, 105680.

**Year 2020**

22. Y. Yao*, **C. Wen***, N. Pham, S.-L. Zhang. On Induced Surface Charge in Solid-State Nanopores. *Langmuir.* **2020**, 36, 8874-8882.
23. S. Zeng*, **C. Wen***, S.-L. Zhang, Z. Zhang A Nanopore Array of Individual Addressability Enabled by Integrating Microfluidics and a Multiplexer. *IEEE sensors journal*, **2020**, 20(3), 1558-1563.
24. C. Li*, **C. Wen***, R. Zeng, S. Zeng, Z.-J. Qiu, Z. Zhang, S.-L. Zhang, D. Wu. Rapid Four-Point Sweeping Method

to Investigate Hysteresis of MoS2 FET. *IEEE Electron Device Letters*. **2020**, 41(9), 1356-1359.

25. C.-W. Tseng, **C. Wen**, D.-C. Huang, C.-H. Lai, S. Chen, Q. Hu, X. Chen, X. Xu, S.-L. Zhang, Y.-T. Tao, Z. Zhang. Synergy of ionic and dipolar effects by molecular design for pH sensing beyond the Nernstian limit. *Advanced Science*, **2020**, 7, 1901001.
26. S. Zeng*, S. Li*, J. Utterström, **C. Wen**, R. Selegård, S.-L. Zhang, D. Aili, Z. Zhang. Mechanism and kinetics of lipid bilayer formation in solid-state nanopores. *Langmuir*, **2020**, 36, 1446−1453.
27. L. Tian, R. Tyburski; **C. Wen**, R. Sun, M. Abdellah, J. Huang, L. D'Amario, G. Boschloo, L. Hammarström, H. Tian. Understanding the role of surface states on mesoporous NiO films. *Journal of American Chemical Society*. **2020**, 142, 43, 18668–18678.
28. S. Li, S. Zeng, **C. Wen**, L. Barbe, M. Tenje, Z. Zhang, K. Hjort, S.-L. Zhang. Dynamics of DNA Clogging in Hafnium Oxide Nanopores. *The Journal of Physical Chemistry B*, **2020**, 124, 51, 11573–11583.
29. N. H. Pham, Ö. Vallin, J. Panda, M. V. Kamalakar, J. Guo, J. Luo, **C. Wen**, S.-L. Zhang, Z.-B. Zhang. High Thermoelectric Power Factor of p-type Amorphous Silicon Thin Films Dispersed with Ultrafine Silicon Nanocrystals. *Journal of Applied Physics*, **2020**, 127, 245304.

### Year 2019

30. S. Zeng*, **C. Wen***, P. Solomon, S.-L. Zhang, Z. Zhang. Rectification of protein translocation in truncated-pyramidal nanopores. *Nature Nanotechnology*, **2019**, 14, 1056–1062.
31. **C. Wen**, S. Li, S. Zeng, Z. Zhang, S.-L. Zhang. Autogenic analyte translocation in nanopores. *Nano Energy*, **2019**, 60, 503-509.
32. **C. Wen**, S. Zeng, S. Li, Z. Zhang, S.-L. Zhang. On rectification of ionic current in nanopores. *Analytical Chemistry*, **2019**, 91(22), 14597-14604.
33. S. Zeng, **C. Wen**, S. Li, X. Chen, S. Chen, S.-L. Zhang, Z. Zhang. Controlled size reduction and its underlying mechanism to from solid-state nanopores via electron beam induced carbon deposition. *Nanotechnology*, **2019**, 30, 455303.
34. J. Zhao, **C. Wen**, R. Sun, S.-L. Zhang, B. Wu, Z.-B. Zhang. A Sequential Process of Graphene Exfoliation and Site-Selective Copper/Graphene Metallization Enabled by Multifunctional 1-Pyrenebutyric Acid Tetrabutylammonium Salt. *Applied Materials and Interfaces*, **2019**, 11, 6448-6455.
35. J. Zhao, R. Pan, R. Sun, **C. Wen**, S.-L. Zhang, B. Wu, L. Nyholm, Z.-B. Zhang. High-conductivity reduced-graphene-oxide/copper aerogel for energy storage. *Nano Energy*, **2019**, 60, 760–767.
36. H. Yang*, C. Li*, L. Yue, **C. Wen**, J. Zhang, D. Wu. Improving Electrical Performance of Few-Layer MoS2 FETs via Microwave Annealing. *IEEE Electron Device Letters*, **2019**, 40(7) 1116-1119.
37. X. Xu, A. Makaraviciute, S. Kumar, **C. Wen**, M. Sjödin, E. Abdurakhmanov, H. Danielson, L. Nyholm, Z. Zhang. Structural Changes of Mercaptohexanol Self-assembled Monolayers on Gold monitored by Impedimetric Aptamer Sensors. *Analytical Chemistry*, **2019**, 91(22), 14697-14704.

### Year 2018

38. **C. Wen**, S. Zeng, Z. Zhang, S.-L. Zhang. Group Behavior of Nanoparticles Translocating Multiple Nanopores. *Analytical Chemistry*, **2018**, 90, 13483−13490.
39. H. Arjmandi-Tash, A. Bellunato, **C. Wen**, R. C. Olsthoorn, R. H. Scheicher, S.-L. Zhang, G. F. Schneider. Zero-Depth Interfacial Nanopore Capillaries. *Advanced Materials*, **2018**, 30, 1703602.
40. J. Zhao, M. Song, **C. Wen**, S. Majee, D. Yang, B. Wu, S.-L. Zhang, Z. Zhang. Microstructure-Tunable Highly Conductive Graphene-Metal Composites Achieved by Inkjet Printing and Low Temperature Annealing. *Journal of Micromechanics and Microengineering*, **2018**, 28, 035006.

### Year 2017

41. **C. Wen***, S. Zeng*, K. Arstila, T. Sajavaara, Y. Zhu, Z. Zhang, S.-L. Zhang. Generalized Noise Study of Solid-State Nanopores at Low Frequencies. *ACS Sensors*, **2017**, 2(2), 300–307.
42. **C. Wen**, Z. Zhang, S.-L. Zhang. Physical Model for Rapid and Accurate Determination of Nanopore Size via Conductance Measurement. *ACS Sensors*, **2017**, 2, 1523-1530.

### Year 2016

43. **C. Wen**, S. Zeng, Z. Zhang, K. Hjort, R. Scheicher, S.-L. Zhang. On Nanopore DNA Sequencing by Signal and Noise Analysis of Ionic Current. *Nanotechnology,* **2016**, 27, 215502.
44. **C. Wen**, Q. Ye, S.-L. Zhang, D. Wu. Assessing kinetics of surface adsorption–desorption of gas molecules via electrical measurements. *Sensors and Actuators B,* **2016**, 223, 791–798.
45. H. Li*, **C. Wen***, Y. Zhang, D. Wu, S.-L. Zhang, Z.-J. Qiu. Accelerating Gas Adsorption on 3D Percolating Carbon Nanotubes. *Scientific Reports,* **2016**, 6, 21313.

### Before year 2015

46. **C. Wen**, N. Zhao, D. W. Zhang, D. Wu, Z.-B. Zhang, S.-L. Zhang. Efficient reduction and exfoliation of graphite

oxide by sequential chemical reduction and microwave irradiation. *Synthetic Metals,* **2014**, 194, 71–76.

47. N. Zhao, **C. Wen**, D. W. Zhang, D. Wu, Z.-B. Zhang, S.-L. Zhang. Liquid-phase and solid-phase microwave irradiations for reduction of graphite oxide. *Chinese Physics B,* **2014**, 23(12), 128101.
48. Z. Pi, J. Zhang, **C. Wen**, Z.-B. Zhang, D. Wu. Flexible piezoelectric nanogenerator made of poly (vinylidenefluoride-co-trifluoroethylene) (PVDF-TrFE) thin film. *Nano Energy*, **2014**, 7, 33–41.
49. **C. Wen**, J. Ren, J. Xia, T. Gu. Self-Assembly Oil–Water Perfusion in Electrowetting Displays. *Journal of Display Technology IEEE*, **2013**, 9(2), 122-127.

## Conference Presentations

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|---|---|---|
| *1.* | *Monitoring dCas9-DNA dynamics with the Nanopore Electro-Osmotic trap* **NWO Biophysics 2023**, Oct. 9th to 10th. 2023, **Veldhoven, the Netherlands** | **Contributed talk** |
| *2.* | *Trapping kinetics of dCas9-DNA complexes in the Nanopore Electro-Osmotic trap* **Nanofluidics 2023**, July 10th to 13th 2023, **Lyon, France** | **Contributed talk** |
| 3. | *Prolonged single-molecule trapping by the NEOtrap for small proteins and protein dynamics detection* **NWO Biophysics 2022.** Oct. 10th to 11th 2022, **Veldhoven, the Netherlands** | **Contributed talk** |
| *4.* | *Stable protein trapping with orientation-locked DNA-origami in the NEOtrap* **Single-Molecule Protein Sequencing 3.** October 27th to Nov. 3rd 2022, **Delft, the Netherlands** | **Poster** |
| 5. | *Prolonging the Nanopore Electro-Osmotic trap time for protein dynamics detection.* **From Solid State to Biophysics X.** Jun. 11th to 18th 2022, **Dubrovnik, Croatia** | **Contributed talk** |
| 6. | *Translocation properties of analytes through asymmetric nanopores*. **Materials Research Society Meeting 2019.** Dec. 1st to 6th 2019, **Boston, USA** | **Poster** |
| *7.* | *Signal and noise properties of translocation current in multiple-nanopore sensors.* **14th IEEE Nanotechnology Materials and Devices Conference.** Oct. 27th to 30th 2019, **Stockholm, Sweden** | **Contributed talk** |
| *8.* | *Ultra-sensitive and responsive capacitive humidity sensor based on graphene oxide.* **11th IEEE International Conference on ASIC.** Nov. 3rd to 6st 2015, **Chengdu, China** | **Contributed paper** |
| *9.* | *Compact modelling and simulation of extended-gate ion-sensitive field-effect transistor*. **12th IEEE International Conference on Solid-State and Integrated Circuit Technology**. Oct. 28th-31st 2014, **Guilin, China** | **Contributed paper** |

## Patents

1. T. Eriksson, **C. Wen**, C. Dekker. Extreme EOF in nanopore systems through charged molecules, *Appl. No.* NL2025E00031, 2025-03-06, **Issued** (the Netherlands patent).
2. D. Wu, **C. Wen**, W. Zhang, S.-L. Zhang. Semiconductor device and method of making, *Appl. No.* US9209268B2, 2015-12-08, **Granted** (USA patent).
3. D. Wu, **C. Wen**, W. Zhang, S.-L. Zhang. Semiconductor device and method of making. *Appl. No.* CN102969276B, **Granted** (Chinese patent for invention)
4. S.-L. Zhang, D. Wu, R. Zeng, **C. Wen**, P. Hu. Semiconductor devices for ionic activity sensing and method of detection, *Appl. No.* CN105301079B, **Granted** (Chinese patent for invention)
5. F. Tang, D. Wu, R. Zeng, **C Wen**, L. Wang. Semiconductor sensory devices and method of detection, *Appl. No.* CN105353000B, **Granted** (Chinese patent for invention)
6. D. Wu, R. Zeng, **C. Wen**, S.-L. Zhang. Ion-sensitive field effect transistor and its fabrication process, *Appl. No.* CN103940885B, **Granted** (Chinese patent for invention)
7. D. Wu, **C. Wen**, R. Zeng, S.-L. Zhang. Ion-sensitive field effect transistor and its fabrication method, *Appl. No.* CN103940884B, **Granted** (Chinese patent for invention)
8. D. Wu, S.-L. Zhang, **C. Wen**. Ion-sensitive field effect transistor and its fabrication method, *Appl. No.* CN103472115B, **Granted** (Chinese patent for invention)
9. S.-L. Zhang, D. Wu, H. Fan, C. Wen. A method and device for nanopore detection. CN115839982A, **Issued** (Chinese patent for invention)
10. F. Tang, D. Wu, **C. Wen**, Q. Ye. Humidity sensors, electronic devices, and breath monitoring systems and method of detection, *Appl. No.* CN104958073A, **Issued** (Chinese patent for invention)
11. Z.-J. Qiu, **C. Wen**, H. Li, Y. Zhang, S.-L. Zhang, R. Liu. A characterization method to stabilize the performance of sensors based on thin film transistor structure, *Appl. No.* CN105067012A, **Issued** (Chinese patent for invention)

12. F. Tang, D. Wu, **C. Wen**, Q. Ye. Humidity sensors and sensor arrays and method of making, *Appl. No.* CN104914138A, **Issued** (Chinese patent for invention)
13. J. Ren, **C. Wen**, T. Gu, J. Xia. A method to improve the solubility of oil-based dye in liquid alkanes, *Appl. No.* CN102660142A, **Issued** (Chinese patent for invention)

## Invited talk

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|---|---|
| 2025-10-10 | *Nanofluidics in Nanopore Sensing Technology*<br>Invited by Prof. Mingzhi Jiao<br>School of Information and Control Engineering, China University of Mining and Technology, China |
| 2025-10-09 | *Electrokinetics and Electro-hydrodynamics in Nanochannels, from Nanopore Sensing Technology*<br>Invited by Prof. Yuwei Qin<br>School of Physics and Electrical Engineering, Weinan Normal University, China |
| 2022-12-15 | *NEOtrap: single molecule protein detection technology*<br>Invited by Prof. Youwei Zhang<br>Center for Gravitational Experiments, Huazhong University of Science and Technology, China |
| 2022-05-25 | *NEOtrap: single molecule protein detection technology*<br>Invited by Prof. Shi-Li Zhang<br>Electrical Engineering, Uppsala University, Sweden |
| 2021-09-28 | *Solid-State Nanopore Biomolecule Sensing Technology: from theory to applications*<br>Invited by Prof. Zhong Lin Wang<br>Beijing Institute of Nanoenergy and Nanosystems, China |
| 2020-09-10 | *Solid-State Nanopore for Sensing: fundamental physics (Online)*<br>Invited by Dr. Zhe Guo<br>School of Optical and Electric Information, Huazhong University of Science and Technology, China |
| 2019-12-23 | *Solid-State Nanopore for Sensing: from theory to applications*<br>Invited by Prof. Youwei Zhang<br>Center for Gravitational Experiments, Huazhong University of Science and Technology, China |
| 2019-12-02 | *Solid-State Nanopore for Sensing: from theory to applications*<br>Invited by Prof. Martin Z. Bazant<br>Chemical Engineering, Massachusetts Institute of Technology, USA |

## Outstanding Skills

### Research:

- Analytical modeling and numerical simulations (COMSOL and MATLAB)
- Construction of electrical characterization/auto-measurement platforms
- Characterization methods for semiconductor materials and electronic devices
- Realization of analog and digital circuits/systems and data processing (amplifier, filter, data acquisition, automatic control, MCU, FPGA, PCB, etc.).
- Fabrication of semiconductor devices in cleanroom environment
- Bio-nanotechnology: wet lab experience, nanopore sensing, DNA origami
- Commercial engineering software: LabVIEW, SPSS, DXP, L-Edit, QUARTUS, etc.

### Teaching and supervising:

- Lectures, exercise classes, and lab teaching for different levels of courses (undergraduate, master, PhD, and open course for public).
- Supervising 2 bachelor and 2 master students.

Prof. Mingzhi Jiao (China University of Mining and Technology, *China*)

Prof. Dongping Wu, Prof. Zhi-Jun Qiu (Fudan University, *China*)