# Shuaihu WU

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## EDUCATION

**Tsinghua University** — Beijing, China
*Master in Mechanical Engineering - Lab of Precision Equipment & Control; GPA: 3.63/4.0* — 2020 - 2023
- **Core Courses:** *Introduction to Modern Control Theories and Methods, Advanced Numerical Analysis, Mechatronic Intelligent Control Engineering, Modern Mechatronics System*
- **Research Field:** *Sensorless Control, Ultra-precision Control, Motor Driver Design*
- **Honor & Scholarship:** *Outstanding Graduates of Beijing City (5%); Outstanding Postgraduate Students Award of Tsinghua University (First Prize)*

**École CentraleSupélec** — Paris, France
*Master in Engineering (Dual Degree); GPA: 4.00/4.3* — 2018 - 2023
- **Core Courses:** *Algorithm, Control Theory, Machine Learning, Statistic Learning, Enterprise Management, Financial Management, Philosophy, Electronics, Quantum Physics*

**Université Paris-Saclay** — Paris, France
*Bachelor in Mathematics (Dual Degree); GPA: 3.00/4.0* — 2019 - 2020
- **Core Courses:** *Measure and Probability, Topology, Ordinary Differential Equation, Abstract Algebra, Holomorphic Function*

**Tsinghua University** — Beijing, China
*Bachelor in Mechanical Engineering; GPA: 3.37/4.0* — 2016 - 2020
- **Core Courses:** *Theoretical Mechanics, Calculus, Linear Algebra, Discrete Mathematics, Basic Program Design, Electrical and Electronics Technologies*
- **Program:** *Selected for "Sino-France 4+4" Program(a dual degree program with 2 years in China as a bachelor student, 2 years in France as an engineering student, and 3 years in China as a master's student. Diplomas of two schools will be awarded upon finish.*
- **Scholarship:** *China Scholarship Council (CSC) Scholarship*

## WORKING EXPERIENCES

**Mechanical Engineer** — 2023 - now, NAURA, Beijing
- Working in the business unit of Plasma Etch System in NAURA Technology Group, which is the largest semiconductor equipment manufacturer in China.
- Work includes design of mechanical structures, drawing, new parts development with suppliers, principle prototype construction and testing.
- Recognized as an outstanding trainee in the two-month new employee training, made a speech in the closing ceremony as trainee representative.

## PUBLICATIONS AND PATENTS

[1] **S. Wu**, C. Hu, Z. Zhao, and Y. Zhu, "High Accuracy Sensorless Control of Permanent Magnet Linear Synchronous Motors for Variable Speed Trajectories," *IEEE Trans. Ind. Electron., 2023*

[2] **S. Wu**, C. Hu, Z. Zhao, R. Zhou, and Y. Zhu, "A Novel Flux Estimator using $\alpha$-$\beta$ Orthogonality Drift Elimination for High Performance Full-speed-range Sensorless Control," *2022 IEEE/ASME AIM* (Oral Report)

[3] Z. Zhao, C. Hu, Z. Wang, **S. Wu**, Z. Liu, Y. Zhu, "Back EMF-Based Dynamic Position Estimation in the Whole Speed Range for Precision Sensorless Control of PMLSM," *IEEE Trans. Ind. Inform., 2022*

[4] C. Hu, **S. Wu**, Z. Zhao, "Method and Device to Find Motor Position," *CN115632588A,2023-01-20.*

[5] E. Wang, C. Hu, X. Liu, B, Feng, **S. Wu**, "Crawling Robot," *CN114248252A,2022-03-29.*

[6] E. Wang, X. Liu, C. Hu, **S. Wu**, B, Feng, "Pole Climbing Device," *CN114161439A,2022-03-11.*

## Research and Projects

**Research on sensorless control**                                           2021-2023, Tsinghua, Beijing

- Proposed a novel flux estimator that can improve the performance of sensorless control in full speed range, with high accuracy and dynamic response.

- Theoretical proof of stability and criteria of parameter selection was given.

- Built an experiment set including a permanent magnet linear synchronous motor, a motor driver and a controller.

- Achieved a sensorless position estimation accuracy of less than 50 micrometers.

- Author or co-authored 3 papers.

**Under-mine Robot Design and Prototype Manufacturing**                      2020, Tsinghua, Beijing

- Designed and manufactured a moving robot prototype to conduct coal-rock identification and mining condition monitoring.

- Special design for extreme under-mine environment, with flexible structure and a novel displacement strategy.

- Designed and built a high load (>10kg) gimbal and its auto-balance system.

- Drafted and submitted 2 patents [5-6].

**AFM Project**                                                              2019, CentraleSupélec, Paris

- To build a low-budget Atomic Force Microscope (AFM) by using an optical pick-up unit (OPU) and a piezoelectric plate.

- Designed the circuit board and realized the control algorithm of the AFM tip.

**Production Internship**                                                    2019, Renault, Paris

- Worked in the production line as an ordinary worker; did interviews with line manager.

- Written a report on factory organization and modern production line management.

## Activities

**Volunteer of 2022 Beijing Winter Olympics**                    Feb 2022 - Apr 2022, Beijing, China

- Worked in the anti-doping team during the Olympic and Paralympic game.

- Honored as "Outstanding Volunteer in Olympics of Tsinghua University" (10% of the volunteers).

**President of Chinese-French Association of Tsinghua University**    Sep 2020 - Sep 2021, Beijing, China

- Organized several activities about French culture and volunteered at the French embassy to help to promote French education.

- Invited to attend the national day dinner party at the French embassy.

**Work-exchange in a Swiss Family**                              Aug 2019, Sion, Switzerland

- Living with local people, worked in a Swiss farm in exchange of food and accommodation.

**Class Leader**                                                 Sep 2017 - Jun 2018, Beijing, China

- Elected as the class leader serving 30 students at Tsinghua University.

- Organized several meetings to discuss concerned issues and several activities to increase the sense of belonging.

**Half Marathon**                                                April 2018, Beijing, China

- Finished a half marathon of 21km.

## Practical Skills

- **Languages**   English(IELTS 7.5), French(level B2), Chinese(Native)
- **Coding**   Python, C++, LaTeX
- **Software**   MATLAB, Simulink, SolidWorks, AutoCAD