

# YUANZHI ZHU

Phone: +41 0764289803  
E-Mail: [yuazhu@student.ethz.ch](mailto:yuazhu@student.ethz.ch)  
Zurich, Switzerland



**RESEARCH INTERESTS:** Signal Processing, Data Science, Human-Computer Interaction

## EDUCATION BACKGROUND

- 09/2016-06/2020 **Beihang University**
- Bachelor of Engineering in **Electrical Engineering**
  - GPA: 3.762/4.0 (90.73/100)
- 10/2019-04/2020 **Technical University Of Munich**
- Exchange Program in **Electrical and Computer Engineering**
- 10/2020-now **Swiss Federal Institute of Technology in Zurich**
- Master in **Electrical Engineering and Information Technology**

## SKILLS & HIGHLIGHTS

- ★★★★★ **C/C++:** Setting up basic Heisenberg lattice point computing system and calculating excited state of energy
- ★★★★★ **MATLAB & Python:** Data processing and data visualization; good at using specific system function to realize required tasks
- ★★★★★ **Finite Element Method Framework:** skilled at simulating physical model (leveraging weak formulation)
- ★★★★★ **Physics & Math:** great intuition enabling faster and better understanding in new concepts

## PUBLICATION

Zhizhong Zhang\*, Yuanzhi Zhu\*, Yue Zhang, Weisheng Zhao, et al. [Skyrmion-based Ultra-low Power Electric-field-controlled Reconfigurable \(SUPER\) Logic Gate](#), IEEE Electron Device Letters (Published as cover)  
(\* These authors contributed equally to this work)

## RESEARCH EXPERIENCES

- 07/2019-10/2019 **Logic Device based on Inverse Spin Hall Effect(ISHE)**, *Advisor: Prof. Yoshichika Otani*  
*University of Tokyo*
- Studied and used the spin transport property in different materials to get a clear Inverse Spin Hall Effect signal
  - Built a model using OOMMF and GetDP to study the magnetization reversal and spin transport property of different material with complex structure
  - Utilized the ISHE to propose logic device, performed current and harvested the logic output like 0 and 1 based on the magnetization direction of the ferromagnetic layer
- 08/2017-06/2019 **Skyrmion-based Ultra-low Power Electric-field-controlled Reconfigurable (SUPER) Logic Gate**, *Advisor: Prof. Yue Zhang*  
*Beijing Advanced Innovation Center for Big Data and Brain Computing (BDBC)*
- Proposed a novel designed skyrmion-based logic gate for high-performance computing, and extended it for ultra-low power parallel computing and brain-like computing
  - Introduced artificial fishtail-shaped hollows for implementing skyrmion divisions, and performed micro-magnetic simulations to validate the logic operations and divisions
  - Enabled re-configurable logic operations including AND, OR, XOR, NOR, NAND to be implemented in single logic gate by leveraging voltage-controlled magnetic anisotropy (VCMA) effect

## SELECTED HONORS & AWARDS

02/2018	Meritorious Winner in The Mathematical Contest in Modeling
09/2017, 09/2018	Second Prize in China Undergraduate Mathematical Contest in Model (Twice)
09/2017	First Prize in Beijing Undergraduate Mathematics Competition (Ranked 87/1276, Beijing)
12/2017	First Prize in Beijing Undergraduate Physics Competition (Ranked 59/1023, Beijing)
03/2018	China Undergraduate Physics Tournament (CUPT) (Ranked 47/305)
11/2018, 11/2019	Academic Competition Scholarship, Beihang University (Twice)
11/2018, 11/2019	Academic Excellence Scholarship, Beihang University (Twice)
10/2017	First-Class Scholarship, Beihang University

## COMPETITIONS & COURSE PROJECTS

02/2018 Meritorious Winner	<b>2018 MCM Problem A: Multi-hop High Frequency (HF) Radio Propagation</b> <ul style="list-style-type: none"><li>Described the turbulent sea surface as combination of superimposed sine waves, considered shadow effect &amp; signals unable to be transmitted after reflection</li><li>Introduced Monte Carlo method (MCM) to eliminate the error caused by the diffraction, and constructed simulated annealing method to simulate the diffraction scene</li><li>Built modified Miller-Brown model to describe rough sea surface, identify how surface roughness factor varies along with changing HF's incident angle</li></ul>
03/2018-05/2018 <i>First Prize for Overall Performance (Ranked 6/150)</i>	<b>3<sup>rd</sup> Beihang Undergraduate Physics Tournament</b> <i>Project: Oiled Ring</i> <ul style="list-style-type: none"><li>Conducted theoretical study on axial movement and experimented using a cardboard ring traveling on the oiled and rotating horizontal cylindrical shaft</li><li>Studied ring's movement when tilting, verified by numerical simulation in MATLAB</li></ul> <i>Project: Radiant Lantern</i> <ul style="list-style-type: none"><li>Generated cross diffraction patterns through rectangular diffraction patterns, performed Fourier transform to obtain diffraction pattern of the mesh diffraction model</li><li>Simulated the diffraction pattern with MATLAB and conducted the experiment with a self-made diffraction grating</li></ul>
09/2017 <i>2nd Prize in China Undergraduate Mathematical Contest in Model</i>	<b>2017 CUMCM Problem A: Calibration and Imaging of CT System Parameter</b> <ul style="list-style-type: none"><li>Solved parameters such as center of rotation through plane geometry &amp; function fitting</li><li>Established the contour reconstruction optimization model and reconstructed the scanned data according to Radon transform and the inverse Radon transform</li><li>Built a high-precision calibration model based on the level of goodness of fit</li></ul>

## SOCIAL PRACTICES & EXTRACURRICULAR ACTIVITIES

09/2016-05/2018 <i>Team Leader</i>	<b>Public Relations Department, Beihang Student Union</b> <ul style="list-style-type: none"><li>Responsible for seeking sponsorship for campus events</li><li>Organized a campus ball, and handled supplies purchase and the on-spot coordination</li></ul>
08/2018	<b>Aerospace Information Co., Ltd.</b> <ul style="list-style-type: none"><li>Investigated the impact of emerging technology companies on tax policy</li><li>Studied technology companies' business philosophy and key technologies</li></ul>
07/2017-08/2017	<b>Practice at Mount. Dadingzi Navigation and Hydroelectric Junction</b> <ul style="list-style-type: none"><li>Carried out the research into the operative and navigable situation of the Junction</li><li>Investigated on the living conditions of residents around the project</li></ul>