BOWEN ZHANG

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EDUCATION

Northwestern Polytechnical University, Shaanxi, China 09/2018-Present
Bachelor of Engineering Degree in *Electrical Engineering, expected*

- Cumulative GPA: **91.41/100**; Comprehensive GPA: **90.41/100**; Major GPA: **93.74/100**.
- Class Ranking: **1/102**.

Northwestern Polytechnical University, Shaanxi, China 09/2017-06/2018

- Major: Materials Science and Engineering.
- Cumulative GPA: **91.53/100**; Class Ranking: **1/198**.

RESEARCH INTERESTS

My research interests mainly lie in Power Electronics, Smart Grid, Renewable Energy Systems, and Electric Vehicle Technologies,.

PUBLICATION

Bowen Zhang, Yufeng Wang, Yuqing Fei, Yao Li, Jian Song, Heng Wang, Qinzhou Lin, Weilin Li. "Virtual Speech: A Novel Bidirectional Z-source DC Circuit Breaker for Fuel Cell Related System". To appear in the *46th Annual Conference of the IEEE Industrial Electronics Society (**IEEE IECON**)*, 2020.

Xue Jiang, **Bowen Zhang**, Yufeng Wang, Yi Xiang, Weilin Li. "Modeling and state of charge estimation of Lithiumion Battery using the autoregressive exogenous model". To appear in the *China International Youth Conference on Electrical Engineering (**CIYCEE**)*, 2020.

RESEARCH EXPERIENCE

Taicang Research Institute of Northwestern Polytechnic University 07/2020-10/2020
Research on Electrochromic Film Power System
Research Assistant; Advisor: Prof. Weilin Li

- Designed the solar panel maximum power point tracking (MPPT) system and 220V single-ended flyback AC-DC module; completed the automatic switching system of photovoltaic, storage battery and mains.
- Realized the normality of the half-bridge inverter; obtained the inverter output of an AC 18V symmetrical square wave, which managed to drive the film to work.
- Developed the prototype of the entire system, successfully achieved all the design goals, and delivered the product to the industry.

Research on Bidirectional DC-DC Converter 01/2020-Present
Research Assistant; Advisor: Prof. Bo Liang

- Expanded the research of H-bridge single-phase DC-DC converter through simulation and experiments, completed the 500W-level converter design, and controlled the output ripple to 1.5V.
- Conducted in-depth research on the existing topological circuits, used DSP to control the drive signals, built simulation models and made prototypes, and collected experimental data for the designed prototypes.
- Set up a simulation model and initially realized the theoretical function.
- Working on reducing the output ripple (in-progress).

Key Laboratory of Aircraft Electric Propulsion Technology, Ministry of Industry and Information Technology (China) 05/2019-05/2020
Optimization of Z Source DC Circuit Breaker
Research Assistant; Advisor: Prof. WeiLin Li

- Proposed a new topology to improve traditional two-way Z-source circuit breaker, which can greatly simplify circuit structure and optimize circuit breaker malfunction problem caused by sudden load changes.
- Set up and ran simulations to verify the correctness of the topology via Saber, theoretically calculated the working process of the circuit breaker, and analyzed parameters such as fault resistance.
- Designed an experimental prototype and tested the experimental parameters for the verification of analysis.

National Key Laboratory of Ultra-High Temperature Ceramic Matrix Composites 05/2018-05/2020
Research on ZrO2 Bionic Ceramic Additive Manufacturing Process
Research Assistant; Advisor: Prof. Laifei Cheng

- Explored the appropriate process for manufacturing bionic ceramics with better human compatibility.
- Applied photocatalysis and 3D printing technology to make bionic ceramics with ZrO2 materials.
- Constructed a 3D model to complete the manufacture of human bionic ZrO2 teeth; confirmed that the bionic ceramic has a structure similar to human bones via electron microscope observation.
- The project was accepted and supported by the Chinese Ministry of Education.

SELECTED PROJECTS

DC-DC Converter-Buck Circuit 12/2019-01/2020
Course: Power Electronics Course Design; Advisor: Prof. Bo Liang; Score:99/100

- Designed a feedback Buck circuit based on SG3525 chip.
- Made prototype and realized the input range of 9V-12V, output stable at 5V.
- Kept the output ripple voltage within 1%.

ARM-based Music Player 12/2019-01/2020
Course: Embedded System and Its Application; Advisor: Prof. Lili Xie; Socre:94/100

- Designed a nine-key music generator based on the ARM system, which emits notes by pressing the button.
- Generated PWM waveform with timer interrupt to realize the change of pitch and tune.
- Performed playing notes with the 7-segment digital tube.

SCHOLARSHIPS & AWARDS

Scholarships & Honors

- **Special Scholarship,** Highest honor for the only **top 20 students** at Northwestern Polytechnical University (15,000+ undergraduates) in recognition of their overall excellence and contribution, 2018.
- **Thanksgiving Scholarship for Chinese Modern Scientists**, **Top 12 students** at Northwestern Polytechnical University (15,000+ undergraduates), 2020.
- **National Scholarship,** Top 0.2% across China, 2018 & 2019 & 2020.
- **Innovation & Entrepreneurship Scholarship,** Top 2% across Northwestern Polytechnical Univ., 2019.
- **First-class Scholarship for Outstanding Students,** Top 10% across Northwestern Polytechnical University, 2019 & 2020.
- **Outstanding Students** of Northwestern Polytechnical University (30 out of 15,000 undergraduates), 2018.

Honors & Awards

- **Meritorious Winner** in Interdisciplinary Contest in Modeling (ICM), 2019.
- **Honorable Mention** in Mathematical Contest in Modeling (MCM), 2020.
- **First Prize** in Advanced Mathematics Competition for Undergraduates (Shaanxi Province), 2018 & 2019.
- **Third Prize** in International Contest of Innovation (iCAN) (Northwest Area), 2018 & 2019.
- **Third Prize** in National University Student Social Practice and Science Contest on Energy Saving & Emission Reduction, 2019.

SKILLS

- **Programming:** C, MATLAB, ARM7, DSP, LaTeX, Python.
- **Software:** SABER, NI Multisim, Microsoft Visio, Altium Designer, Origin, Auto CAD, SPSS.
- **Development Skills:** FPGA.
- **Language:** Native Speaker of Mandarin Chinese and Fluent English.